



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

NAME OF APPLICANT: Demaqua Trading (Pty) Ltd

REFERENCE NUMBER: NC30/5/1/3/2/10204MP

ENVIRONMENTAL MANAGEMENT PLAN

**SUBMITTED
IN TERMS OF SECTION 39 AND OF REGULATION
52 OF THE MINERAL AND PETROLEUM
RESOURCES DEVELOPMENT ACT, 2002,
(ACT NO. 28 OF 2002) (the Act)**

STANDARD DIRECTIVE

Applicants for prospecting rights or mining permits, are herewith, in terms of the provisions of Section 29 (a) and in terms of section 39 (5) of the Mineral and Petroleum Resources Development Act, directed to submit an Environmental Management Plan strictly in accordance with the subject headings herein, and to compile the content according to all the sub items to the said subject headings referred to in the guideline published on the Departments website, within 60 days of notification by the Regional Manager of the acceptance of such application. This document comprises the standard format provided by the Department in terms of Regulation 52 (2), and the standard environmental management plan which was in use prior to the year 2011, will no longer be accepted.

IDENTIFICATION OF THE APPLICATION IN RESPECT OF WHICH THE ENVIRONMENTAL MANAGEMENT PLAN IS SUBMITTED.

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1 REGULATION 52 (2): Description of the environment likely to be affected by the proposed prospecting or mining operation

1.1 The environment on site relative to the environment in the surrounding area.

Status of the cultural environment that may be affected

The Namaqualand copper mines and their associated infrastructure and cultural landscape reflect the beginnings of the mining industry in South Africa in all the myriad ways in which that industry influenced and continues to influence society through the movement and housing of people, the development of transport and other infrastructure and industries and in the development of technological and scientific endeavour.

Any form of mining or prospecting will therefore be a continuation of the socio-cultural aspects of the area.

Status of any heritage environment that may be affected

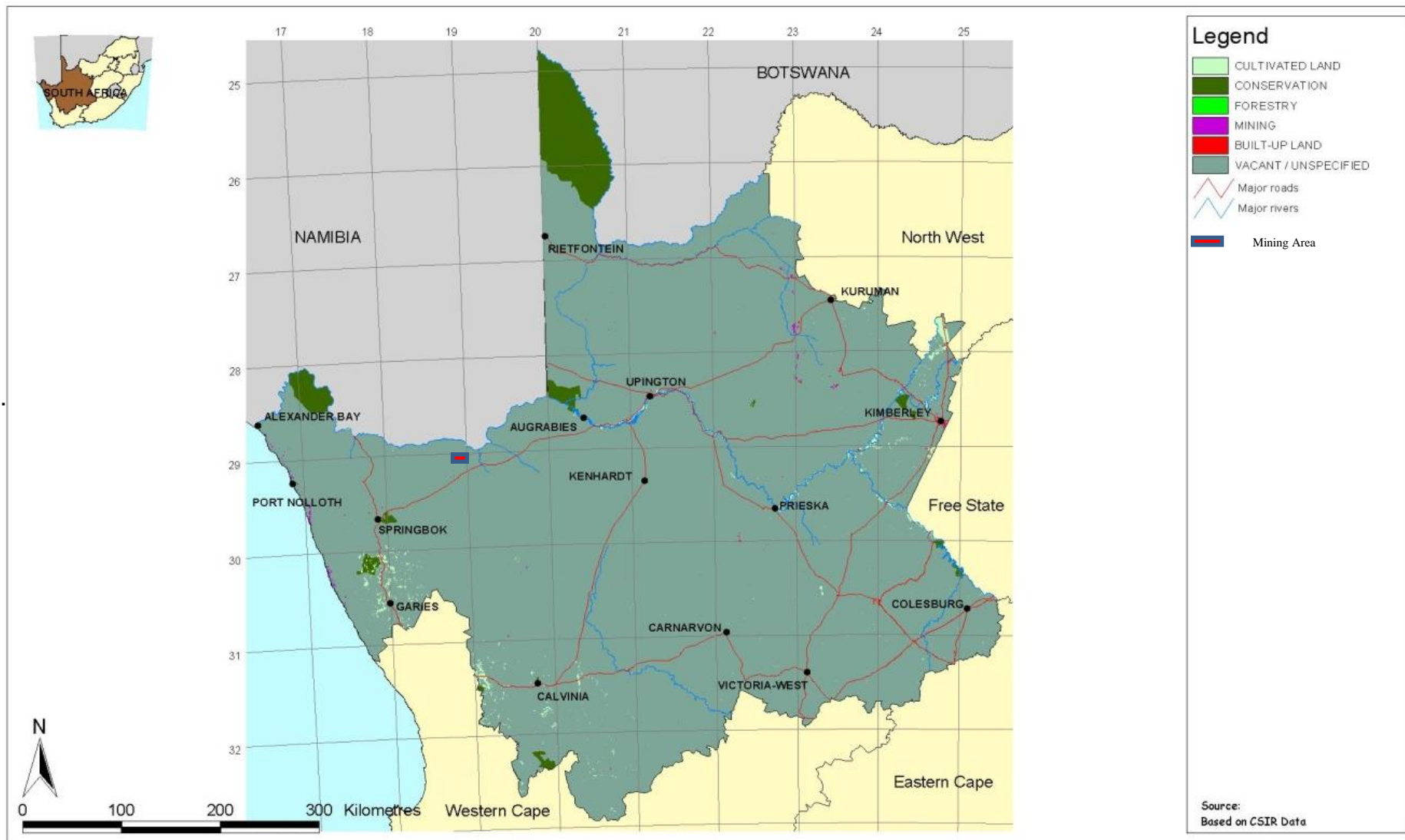
The terrain is underlain almost entirely by different granitic intrusives. The granites more resistant to weathering form Pluto's (mountain) in the form of granite domes, with its long axis striking northwest-southeast. In the surrounding flat-lying areas the granites are less resistant to weathering and are indicated by sporadic small outcrops. The granitic rocks have been highly metamorphosed and there is very little chance of fossils being preserved in these rocks. No fossils have yet been reported from any of the adjacent granite mines and the chance to unearth any fossils or artefacts is therefore very little and given the high cost of a visit to this site, no first phase paleontological assessment is deemed necessary. No other heritage resources such as built structures over 60 years old, sites of cultural significance associated with oral histories, burial grounds and graves of victims of conflict, and cultural landscapes or viewsapes are present on the mining area applied for.

Status of any current land uses and the socio-economic environment that may be directly affected

Approximately 90% of the region is used for livestock grazing and production, with the remainder comprising of agriculture and urban development. Tourism is a seasonal but rapidly growing feature – with visitors to the region arriving almost exclusively between July and October in order to take in the world renowned yearly flower display. Urban development is not a major feature of the landscape, and is not expected to increase much in the coming years.

Mining will only be a temporary land use (2 years) where after land use will revert back to the pre-mining land use grazing. Productivity of the land with regard to land use is very low and mining will have no impact on the productivity of the area. Most of the Northern Cape is defined as vacant or unspecified land use (Refer Map 1).

Map 1: Land use patterns of the Northern Cape



Status of any infrastructure that may be affected

No infrastructure will be affected as no infrastructure is present on the proposed mining area. Existing roads and tracks will be used and in the case of new tracks be developed it will be addressed at final closure and rehabilitation.

Status of the biophysical environment that may be affected

Topography

Namaqualand is a unique and diverse environment – owing in large part to the presence of four distinct biogeographically regions within its boundaries. The Orange River valley lies to the north and is characterized by very dry desert conditions. In the west the area is composed of coastal plains – which transition into granite hills that straddle the escarpment, before transforming into low lying Bushmanland plains to the East of Springbok.

The area is characterized by an expansive, undulating landscape. The area is dominated by a plain of dry grasslands with scattered ancient rocky outcrops, named Inselbergs (Refer Map 2).

Soil

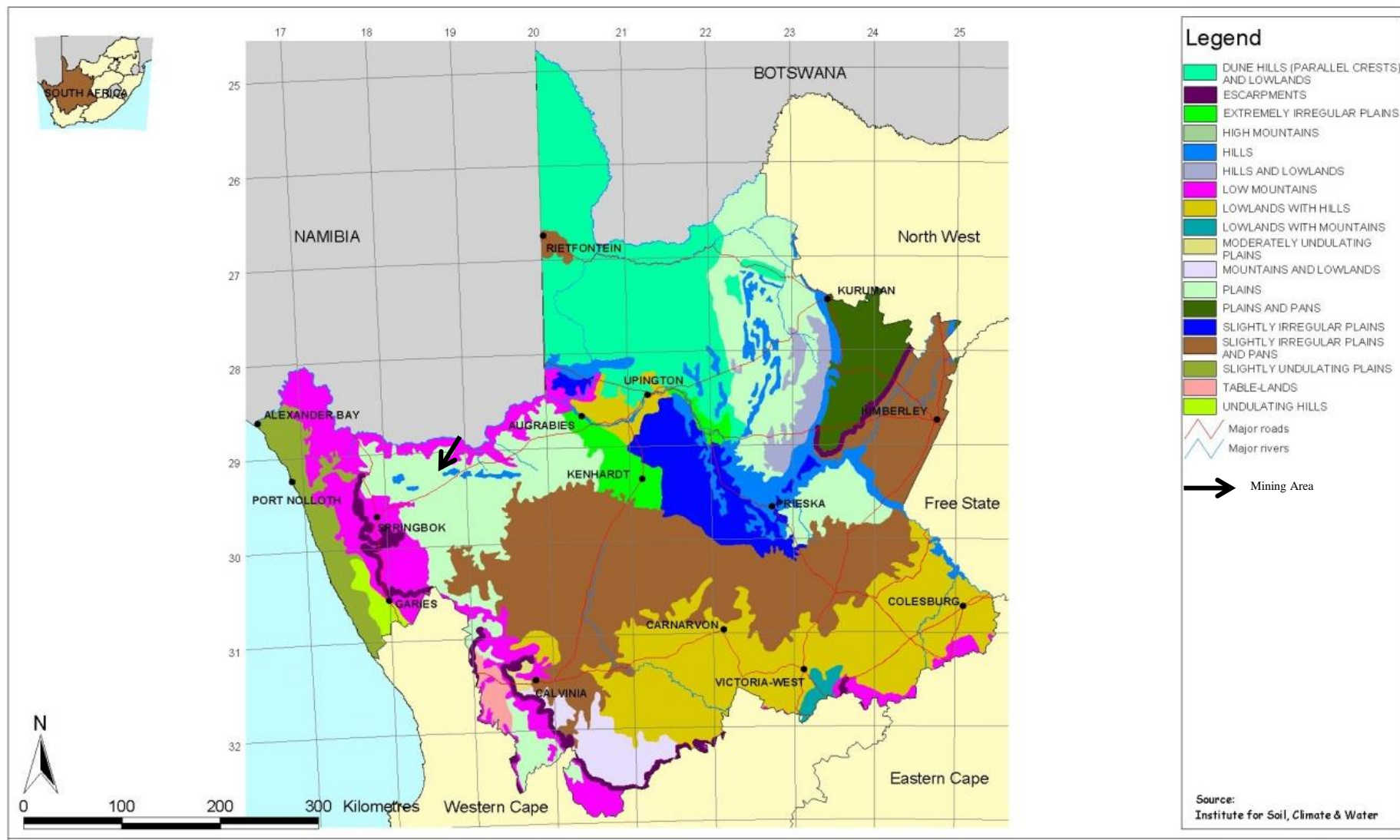
The sands and calcrete are of Quarternary sediments. The area is mostly representing the Af land type, with deep red sands predominant. Rainfall is low, 70-110 mm per annum, mostly falling in late summer to autumn. Average minimum and maximum temperatures in the area are 15°C to 38°C in summer and 0°C to 18°C in winter. The days in the summer are long (sunrise at around 6:00am, sunset close to 8:00pm), and short in the winters (sunrise after 07:30am, sunset before 6:00pm). The soils in a regional context are reddish, moderately shallow, sandy, and often overlay layers of calcrete of varying depths and thickness. The soils are typically weakly structured with low organic content. These soils drain freely which results in a soil surface susceptible to erosion, especially wind erosion when the vegetation cover is sparse and gulley erosion in areas where storm-water is allowed to concentrate (Refer Map 3).

The soils in the area are generally not suitable for dry land crop production and the only area where intensive crop cultivation is feasible is along the Orange River where irrigation is possible therefore the pre-prospecting land capacity is categorized as Class III grazing land. The productivity of the area is very low at 8Ha/SSU.

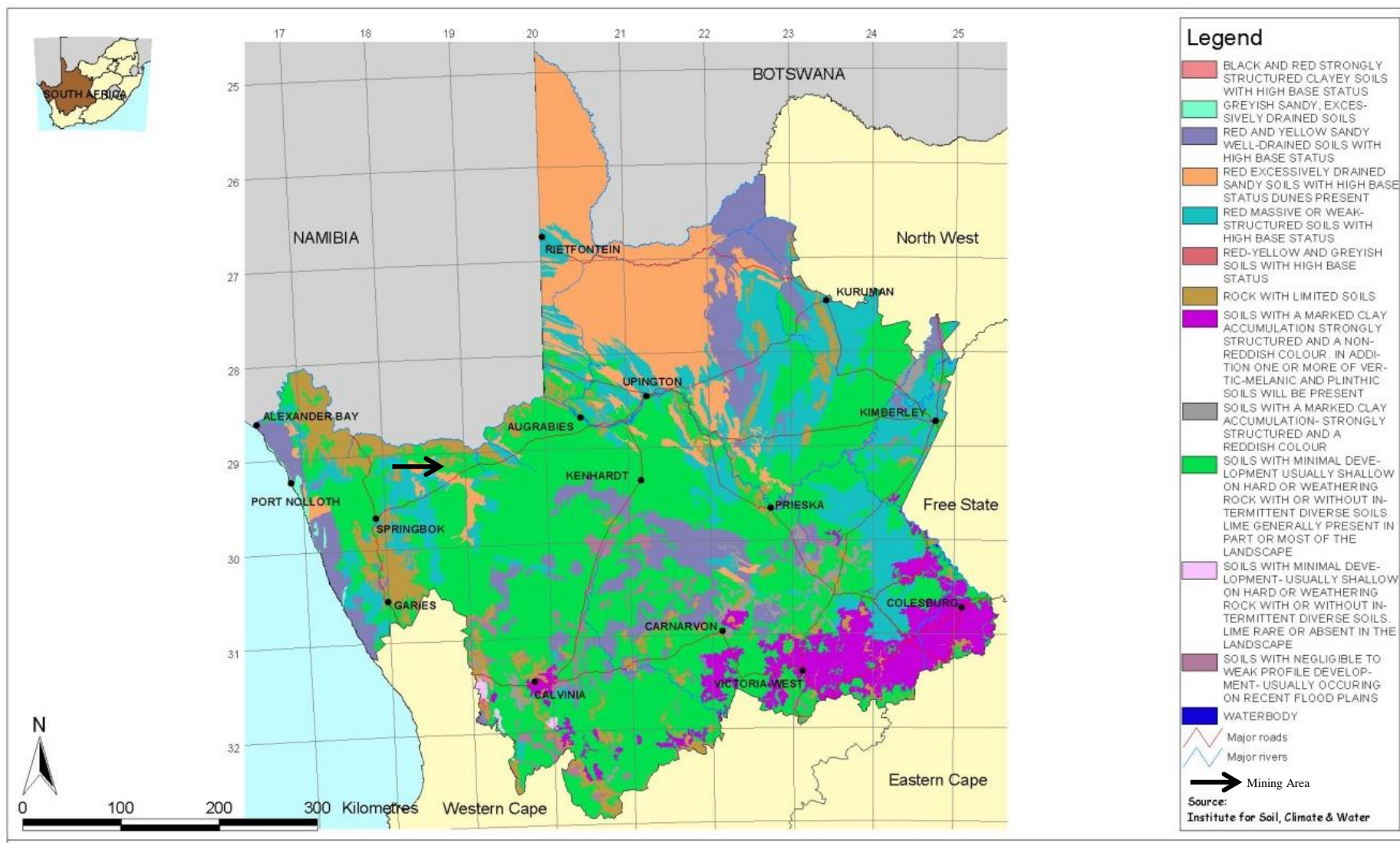
The mining area has been classified into the following classes of land capability:

Arable land:	0 %
Grazing land:	100%
Wetland:	0 %
Wilderness land:	0 %
Urban and mining	0%

Map 2: Terrain Morphological units of the Northern Cape



Map 3: Generalised Soil Description of the Northern Cape



Natural vegetation / plant life

The mining area is situated within the Nama-Karoo Biome. The vegetation consist of Bushmanland Arid Grassland vegetation type covering an area of 45478.96 Ha that is rated as least threatened with little of the area transformed less than 0.6%. Erosion is very low (60%) and low (33%). Altitude varies mostly from 600–1 200 m. The dominant vegetation is sparse open grassland, with *Stipagrostis* species prominent, together with scattered, drought resistant dwarf shrubs. Prominent species are as follow:

Dwarf shrubs

<i>Aridaria noctiflora</i>	<i>Eriocephalus microphyllus</i>	<i>Galenia fruticosa</i>
<i>Lycium bosciifolium</i>	<i>Pentzia spinescens</i>	<i>Plinthus karroicus</i>
<i>Pteronia mucronata</i>	<i>Rhigozum trichotomum</i>	<i>Rosenia humilis</i>
<i>Sarcostemma viminalis</i>	<i>Tetragonia arbuscula</i>	

Grasses

<i>Aristida adscensionis</i>	<i>Aristida congesta</i>	<i>Centropodia glauca</i>
<i>Enneapogon desvauxii</i>	<i>Schmidtia kalahariensis</i>	<i>Stipagrostis brevifolia</i>
<i>Stipagrostis ciliate</i>	<i>Stipagrostis obtusa</i>	

Forbs

<i>Barleria rigida</i>	<i>Berkheya spinosissima</i>	<i>Crassula muscosa</i>
<i>Dicoma capensis</i>	<i>Gazania lichtensteinii</i>	<i>Grielum humifusum</i>
<i>Hermannia spinosa</i>	<i>Hirpicium echinus</i>	<i>Manulea nervosa</i>
<i>Monechma incanum</i>	<i>Peliostomum leucorrhizum</i>	<i>Requienia</i>
<i>sphaerosperma</i>	<i>Ruschia robusta</i>	<i>Salsola tuberculata</i>
<i>Senecio cotyledonis</i>	<i>Sesamum capense</i>	<i>Tribulus zeyheri</i>
<i>Zygophyllum flexuosum</i>	<i>Zygophyllum microphyllum</i>	

Animal Life

Various small mammals and reptiles occur. Larger indigenous herbivore species are absent due to the conflicting land use. The habitat is well represented in the surrounding area.

Surface Water

No drainage channels with permanent water occur within the prospecting area and there is no dendritic system which could be disturbed. Surface water only accumulates in the drainage channels after exceptional good rains. Given the variability of semi-arid rainfall, the calculation of the mean annual runoff (MAR) would be of no use. The MAR is in any event very low given the low rainfall less than 200 mm per year occurring mainly in the summer months, high evaporation rates, and shallow grade of the slope toward the drainage channels and the permeability of the soils.

The surface water quality (when available) is suitable for animal consumption but not for potable water.

Groundwater

The majority of towns and farms rely on groundwater resources for potable water. Thus, the higher rainfall areas are key recharge zones for these groundwater resources. Consequently, land use management of these catchment areas is critical for the maintenance of the quality and quantity of water sourced from each area. For example, water courses and wetlands that have been cleared for agricultural purposes, or overgrazed, will not only cause soil erosion, but most importantly cause increased water runoff, thus reducing the amount of water that feeds back into the water table for consumption.

Air Quality

The air background quality in the area is very good due to low industrial activity and very low population density. Given the surrounding extent of semi-desert, dust generation is high under windy conditions (dust storm) however under normal conditions no extreme dust conditions are noted on site.

Noise

Background noise level is the same as for other small settlements and at present such noise levels are low, below 55dBA.

1.2 The specific environmental features on the site applied for which may require protection, remediation, management or avoidance.

Description of potential impacts identified on the cultural heritage environment

Mining will continue from an existing granite quarry and the rocks have been highly metamorphosed there is very little chance of fossils being preserved in these rocks. No fossils have yet been reported in any of the mining operations. A phase 1 archaeological assessment has also shown that the proposed mining operation will have little impact on the heritage resources of the area. Should any fossils be discovered or unearthed in the process of mining, the mining permit holder will contact a South African Museum or University which employs palaeontologists so that the necessary palaeontological salvage operations can take place. No other heritage resources such as built structures over 60 years old, sites of cultural significance associated with oral histories, burial grounds and graves, graves of victims of conflict, and cultural landscapes or viewsapes are present on the mining area.

Description of potential impacts identified on the socio- economic conditions

The only other land use in the area is small stock grazing and due to the small extends of the mining operation there will be no impact on productivity.

Description of potential impacts identified on: employment opportunities, community health, and community proximity

Mining operations will have a positive impact on the socio-economic environment in the form of skills development and job creation.

Description of potential impacts identified on the biophysical environment

The total footprint of mining operations will be small and the overall impact on the biophysical environment will be insignificant as can be seen from the EIA section 2. Mining will also take place in an area that has been disturbed by historic mining activities and the implementation of the mitigating and management measures prescribed in the EMP section 3 will address all impacts and after implementation of the mitigating measures most impacts can be regarded as insignificant especially when looking at the current state of the environment

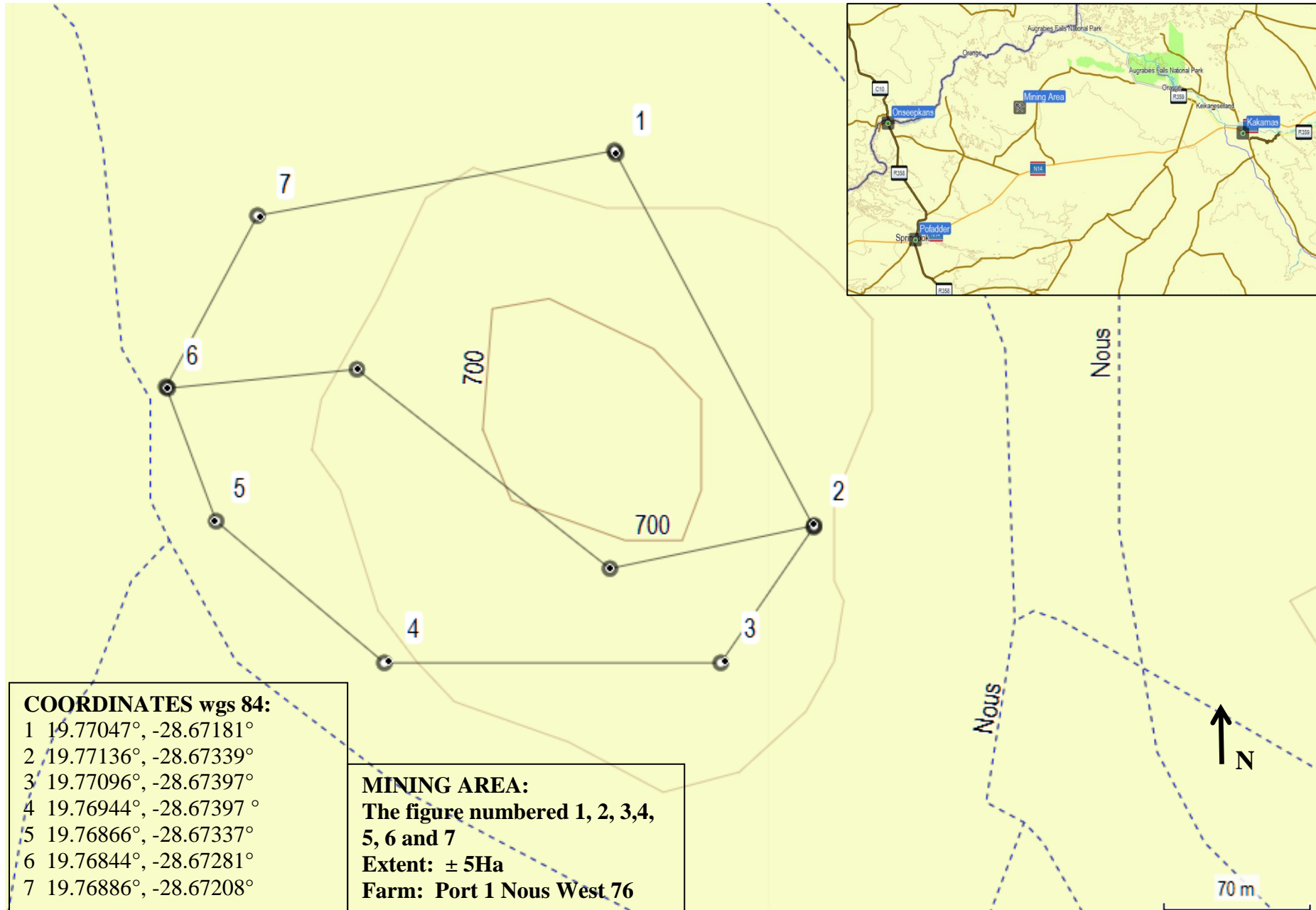
1.3 Confirmation that the description of the environment has been compiled with the participation of all interested and affected parties,

The consultation report was made available to the landowners and all other interested parties for comment. All comments received were addressed in this EMPR.

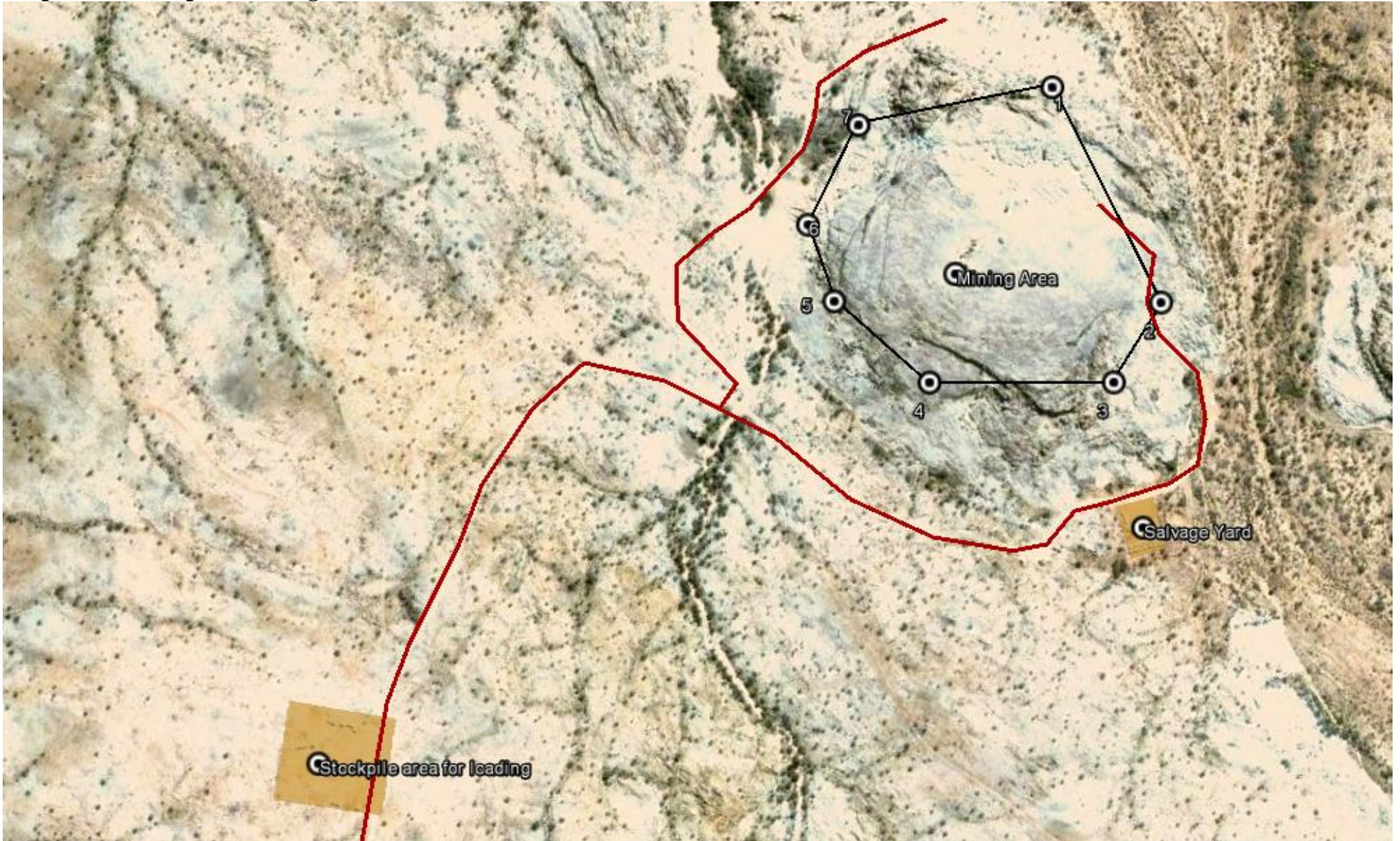
1.4 Plan showing the spatial locality of all environmental, cultural/heritage and current land use features identified on site.

Refer maps 1, 2 and 3 above and map 4 and 5 below

Map 4: Layout of mining area



Map 5: Landscape of mining area



2 REGULATION 52 (2) (b): Assessment of the potential impacts of the proposed prospecting or mining operation on the environment, socio-economic conditions and cultural heritage.

2.1 Description of the proposed mining operation.

2.1.1 Plan of the main activities with dimensions

The plan submitted under paragraph 1.4 show the main land uses on the proposed mining area and as can be seen the area is zoned as agricultural or unspecified land use. With regard to the proposed mining activities no additional infrastructure including roads will be constructed that needs to be indicated on the plan.

The plans as contemplated in regulation 2.2, of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) will be updated on an annual basis with regard to the actual progress of the establishment of surface infrastructure, mining operations and rehabilitation together with an Performance assessment report as contemplated in regulation 55(1) (c) on the implementation of the Environmental Management Plan.

2.1.2 Description of construction, operational, and decommissioning phases

Construction phase

No infrastructure or roads will be constructed due to the small scale of mining. Infrastructure at the operations only includes a salvage yard and stockpile area.

Pollution prevention measure will be implemented according to the prescripts of the EMP section 3.

Operational phase

Mining of dimension stone in South Africa traditionally takes place using diamonds wire saws to cut the sides of the block out of the solid rock body and drilling of closely-spaced holes with plug and feather blasting along the base and back of the block to release the block from the “host” rock (refer photo 1).

Photo 1 Mining process with regard to granite mining



The block is removed from the excavation by front–end loader and transported to the dressing yard where pneumatic drills “dress” the material for final transport to the international market.

The mining will be conducted using the following equipment:

- Diamond wire saw/s.
- Pneumatic drills used to drill the closely spaced holes at the base and behind the block.
- Front end loader to move material around the site and loading on haul trucks
- Front end loader for moving waste rock to waste dump and dressing of waste dump

Decommissioning phase

Regulations 56 to 62 outline the entire process of mine closure, both as a guide to the process to be followed for mine closure, and also to address the legal responsibility with regard to the proper closure of operations. In terms of Section 37 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002), the holder of a right is liable for any and all environmental damage or degradation emanating from his operation, until a closure certificate is issued in terms of Section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002).

"An application for a closure certificate must be accompanied by an environmental risk report which must include-

- (a) the undertaking of a screening level environmental risk assessment where-
- (b) the undertaking of a second level risk assessment on issues classified as
- (c) assessing whether issues classified as posing potential significant risks are acceptable without further mitigation;
- (d) issues classified as uncertain risks be re-evaluated and re-classified as either posing potential significant risks or insignificant risks;
- (e) documenting the status of insignificant risks and agree with interested and affected persons;
- (f) identifying alternative risk prevention or management strategies for potential significant risks which have been identified, quantified and qualified in the second level risk assessment;
- (g) agreeing on management measures to be implemented for the potential significant risks which must include-

2.1.3 Listed activities (in terms of the NEMA EIA regulations)

With regard to listed activities in terms of the Environmental Impact Assessment Regulations Listing Notice 2 of 2010, the competent authority in respect of the activities listed is the environmental authority in the province in which the activity is to be undertaken, unless - (b) the activity is to be conducted in or on a mining area or is to transform the area where the activity is to be conducted into a mining area in which case the competent authority is the Minister of Minerals and Energy. In this case all activities are to take place within a prospecting area therefore all activities will be covered by this EMPR.

The exception mentioned in (b) above does not apply to the following activities contained in the notice 1;2;5;8; 9; 10; 12; 13; 14; 17; 24 and 25.

The activities where environmental authorizations is required in addition to the approved EMPR are addressed below with their applicability to this specific operation

Activity Number	Activity description	
1.	The construction of facilities or infrastructure for the generation of electricity where the electricity output is 20 megawatts or more.	Not applicable
2.	The construction of facilities or Infrastructure for nuclear reaction including energy generation, the production, enrichment, processing, reprocessing, storage or disposal of nuclear fuels, radioactive products and nuclear and radioactive waste.	Not applicable
5.	The construction of facilities or infrastructure for any process or activity which requires a permit or license in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent and which is not identified in Notice No. 544 of 2010 or included In the list of waste management activities published In terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case that Act will apply.	Not applicable
8.	The construction of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex.	Not applicable
9.	The construction of facilities or infrastructure for marine telecommunication.	Not applicable
10.	The construction of facilities or infrastructure for the transfer of 50 000 cubic metres or more water per day from and to or between any combination of the following: (i) water catchments (ii) water treatment works: or (iii) impoundments, excluding treatment works where water is to be treated for drinking purposes	Not applicable
12	The construction of facilities, infrastructure or structures for aquaculture of – (i) finfish, crustaceans, reptiles or amphibians where the facility, infrastructure or structures will have a production output of 200 000 or more kg per annum (live round weight), (ii) molluscs where the facility, infrastructure or structures will have a production output of 150000 or more kg per annum (live round weight) (iii) aquatic plants where the facility, infrastructure or structures will have a production output of 200 000 or more kg per annum (live round weight), excluding where the construction of facilities, infrastructure or structures is for purposes of offshore cage culture In which case activity 13 in this Notice will apply	Not applicable
13	The construction of facilities, infrastructure or structures for aquaculture of offshore cage culture of finfish, crustaceans, reptiles, amphibians, molluscs and aquatic plants where the facility, infrastructure or structures will have a production output of 100 000 or more kg per annum (live round weight).	Not applicable
14	The construction of an island, anchored platform or any other permanent structure on or along the sea bed.	Not applicable
17	The extraction or removal of peat or peat soils, including the disturbance of vegetation or soils in anticipation of the extraction or removal of peat or peat soils.	Not applicable
24	Construction or earth moving activities In the sea, an estuary, or within the littoral active zone or a distance of 100 metres Inland of the high-water mark of the sea or an estuary, whichever distance is the greater, in respect of: (i) facilities associated with the arrival and departure of vessels and the handling of cargo (ii) piers; (iii) inter- and sub-tidal structures for entrapment of sand; (iv) breakwater structures; (v) coastal marinas; (vi) coastal harbours or ports; (vii) structures for reclaiming parts of the sea;	Not applicable

	(viii) tunnels; or (ix) underwater channels; but excluding — (a) activities listed in activity 16 in Notice 544 of 2010, (b) construction or earth moving activities if such construction or earth moving activities will occur behind a development setback line; (c) where such construction or earth moving activities will occur in existing ports or harbours where there will be no increase of the development footprint or throughput capacity of the port or harbour; or (d) where such construction or earth moving activities takes place for maintenance purposes	
25	The expansion of facilities for nuclear reaction including energy generation, the production, enrichment, processing, reprocessing, storage or disposal of nuclear fuels, radioactive products and nuclear and radioactive waste.	Not applicable

2.2 Identification of potential impacts

2.2.1 Potential impacts and listed activities

The potential impacts are listed in paragraph 3.1.2 below together with an assessment of these impacts. The only significant and long term impact of the operation will be on the topography and aesthetic value of the area. Mitigation measures to manage the potential impacts are provided for in the EMP section 3.

2.2.2 Potential cumulative impacts

Singly, many of the effects on the environment may well be insignificant. However, when they occur simultaneously or in a haphazard way, their significance may increase by orders of magnitude.

The majority of impacts are localized i.e. affect the immediate vicinity of the mining area only. However many mines occur in the same area and therefore the cumulative impact became significant and may be felt over a much larger area.

2.2.3 Potential impact on heritage resources

Due to the extent of mining activities to date no further impact on any heritage resources are foreseen. No fossils have yet been reported in any of the mining operations. Should any fossils be discovered or unearthed in the process of mining, the mine manager will contact a South African Museum or University which employs palaeontologists so that the necessary palaeontological salvage operations can take place. The mitigating measures as proposed in the phase 1 archaeological assessment will also be implemented. No other heritage resources such as built structures over 60 years old, sites of cultural significance associated with oral histories, burial grounds and graves, graves of victims of conflict, and cultural landscapes or views are present on the prospecting area.

Cultural landscape elements are lacking on the site. The sense of place will be affected, however, but, due to the relatively limited extent of the visual impacts in the area, this impact is not considered very significant. Impacts to the sense of place are likely to be generally low due to the already altered state of the local area.

2.2.4 Potential impacts on communities, individuals or competing land uses in close proximity

The only other land use in the area is small stock grazing and due to the small extends of the mining operation there will be no impact on productivity.

Mining operations will however have a positive impact on the socio-economic environment in the form of skills development and job creation.

The area is farmland that is not close to any settlement therefore no land development projects are in progress.

2.2.5 Confirmation that the list of potential impacts has been compiled with the participation of the landowner and interested and affected parties
No proposals were received during the consultation process.

2.2.6 Confirmation of specialist report appended.
No specialist reports are deemed necessary as no sensitive areas are included in the proposed area and due to the small scale of the proposed mining operation. A phase 1 Archaeological assessment is however attached as an appendix.

3 REGULATION 52 (2) (c): Summary of the assessment of the significance of the potential impacts and the proposed mitigation measures to minimise adverse impacts.

3.1 Assessment of the significance of the potential impacts

3.1.1 Criteria of assigning significance to potential impacts

The impact on each of the aspects is measured according to the following table of significance:

Negative

High Significance	Recommended level always exceeded with associated widespread community action Disturbance to areas that are pristine, have conservation value, are important resource to humans and will be lost forever Complete loss of land capability Destruction of rare or endangered specimens
Moderate	May affect the viability of the project Moderate measurable deterioration and discomfort Recommended level occasionally violated - still widespread complaints Partial loss of land capability Complete change in species variety or prevalence May be managed Minor disturbances to aquatic ecosystems or local water resources Impact temporary
Minor/Insignificant	Important but easily controlled by routine management actions Minor deterioration change not measurable Recommended level will rarely if ever be violated Sporadic community complaints Minor deterioration in land capability Minor changes in species variety or prevalence
Positive	
Minor Significant	Improvements in local socio-economics Major improvements in local socio-economics with some regional benefits

Criteria used for the significance rating

- All surface disturbances are rated moderate to high depending on footprint
- Dust is rated low if only minimal dust is expected to accumulate over the permit period, medium if it is expected to require dust suppression such as watering, and high if there is a risk that it will migrate beyond the permit area.
- Noise is rated low if no machinery is to be used, medium if machinery is to be used, and high if there is a potential for complaints from public and neighbours.
- All drainage is rated moderate if the impact is temporary otherwise high
- All blasting is rated high
- All dust and noise from loading, hauling and transport is rated moderate
- Drainage from ablution facilities are rated moderate

3.1.2 Potential impact of each main activity in each phase, and corresponding significance assessment

Potential impact during Construction

Considerable changes take place as the mine infrastructure, plant and facilities are constructed, and when the ore body is first exposed. The scale and sequence of events varies from mine to mine, but always entails dramatic changes to most features of the local environment. The following is generic activities with regard to construction with potential environmental impact. Due to the specific nature of the operation not all activities will take place during this mining operation.

Potential Activities	Applicable to operation
Stripping/storing of topsoil	Yes for virgin areas
Preparation/levelling of sites	Yes for virgin areas
Installation of mine and surface water treatment plants	Not applicable
Construction of mine facilities, offices and roads	Not applicable
Construction of storage facilities	Already exist needs upgrading
Landscaping of site	Not applicable
Construction of staff housing and infrastructure	Already exist
Potential environmental impacts	Category
Fauna and flora habitat loss and disturbance	Natural Vegetation
Reduction in biodiversity on site	Natural Vegetation
Decreased aesthetic appeal of site	Aesthetics Visual
Altered drainage patterns and runoff flows	Topography
Increased erosion of site area	Soil
Increased siltation of surface waters	NA
Altered landforms due to construction	NA
Contamination of surface and groundwater by seepage and effluent discharges	Ground water
Discharge of contaminants via mine dewatering activities	NA
Increased demand on local water resources	NA
Ground and surface water contamination from seepage and contamination from fuel spills and leakages	Ground water

No infrastructure or roads will be constructed due to the small scale of operations as described in the operational phase below. It will only be the storage area and salvage yards that needed to be upgraded.

Potential impact during Operation

- Removal and storage of ores and waste material

The routine operational phases account for most of the environmental impacts and are considered to have the greatest potential to drive environmental change

Potential Activities	Applicable to operation
Stripping/storing of top soil	Yes for virgin areas
Waste rock overburden stockpiles	Yes
Low grade ore stockpiles	Yes
High grade ore stockpiles	Yes
Potential environmental impacts	Category
Land alienation from waste rock overburden stockpiles and disposal areas	Topography Natural vegetation
Increased erosion and siltation of nearby surface water bodies	NA

- Processing - Milling and grinding Extraction/Concentration

The extent to which mining operational activities act as drivers of environmental change depends in part on the type, scale, duration and magnitude of the activities, and the sensitivity of the receiving environment

Potential Activities	Applicable to operation
Transport of granite blocks to sorting and dressing area	Yes
Preliminary crusher/screening/washing of ore	Not applicable
Milling and grinding of ore	Not applicable
Flotation and chemical concentration/leaching of ore and final product	Not applicable
Transport of ores to smelter	Not applicable
Stockpiling of final product	Not applicable
Potential environmental impacts	Category
Ground surface disturbance	Natural Vegetation
Disturbance due to noise and vibrations	Not applicable
Dust and fumes, mine vehicles and transportation systems	Not applicable
Discharge of contaminated water	Not applicable
Windborne dust and radionuclides	Not applicable
Vapour emissions from processing	Not applicable
Spillage of corrosive liquids	Not applicable

- Transport of final product to market

Seldom associated with significant impacts on the biophysical environment

Potential Activities	Applicable to operation
Packaging/loading of final product into transportation	Not applicable
Transport of final product	Yes
Potential environmental impacts	Category
Disturbance due to noise, vibration and site illumination	NA
Dust and fumes from exposed product stockpiles	NA

Mining will take place in an area that has been disturbed by historic mining activities and the implementation of the mitigating and management measures prescribed in the EMP will address all impacts and after implementation of the mitigating measures most impacts can be regarded as insignificant especially when looking at the current state of the environment. The following is the main activities that will take place during the operational phase and that will have an impact in terms of spatial disturbance:

Possible risk factor	Qualitative impact level	If Insignificant, Why?
<i>Geology:</i>	Insignificant	Mining by means of cutting blocks will have an impact on the geology, but this will be minimal as the area where blocks will be cut is very small. The cuts will also disturb the geologic sequence of sediment on a small scale. Due to the removal of the granite block a cut face of maximum 3 meters high will remain if the top of the outcrop is not removed completely. No excavations will be created for backfilling of waste rock therefore mixing of the geological sequence of sediment will not occur.
<i>Topography (Safety):</i>	Potential significant impact	Will require mitigation refer paragraph 3.2
<i>Land Capability:</i>	Insignificant	In the overall scheme of the surrounding landscape, the mining footprint of 5Ha can be considered minor and the remaining impact in this regard is insignificant.
<i>Soil:</i>	Insignificant	No topsoil is available on the granite outcrop where mining will take place therefore there will be no impact on the soil. Development areas for storage areas and stockpile areas need topsoil to be removed and stockpiled. Such topsoil will be replaced over the affected area once rehabilitated. All topsoil must be removed ahead of any development or disturbance of natural veld (including roads and stockpile areas). This topsoil must be stockpiled in berms which never exceed 2m in height to be placed on the high side (if applicable) of the development. This will, in the unlikely event of sheet flow from rainfall, act as storm water cut-off ridges. The topsoil thus retained will be used in the rehabilitation of the site as growth medium to be spread over areas ready for final rehabilitation. Any oil or fuel leaks caused must be removed with the saturated soil and placed in bags or drums for disposal at a suitable site as directed by the Municipality Health office. The mitigation measures provided for under the general requirements for pollution control measures in the EMP will address all potential impact with regard to topsoil.
<i>Vegetation:</i>	Insignificant	Will require mitigation refer paragraph 3.2 for management and mitigation measures
<i>Fauna.</i>	Insignificant	Minimal risk given the low density of fauna and the fact that the habitat is well represented in the adjacent area for dispersal.

<i>Surface water.</i>	Insignificant	No surface water present on the site. The hydrological integrity of drainage channels will not be altered by attenuating or diverting any of the natural flow.
<i>Groundwater.</i>	Insignificant	Due to the shallow nature of operations the impact on the groundwater is considered insignificant. The absence of a waste handling program can however have a significant impact through oil and fuel spills and soil contamination.
<i>Air Quality:</i>	Insignificant	Isolation of site and small scale of operation precludes any impact in this regard No FRD will be created on site Stockpiling, loading and hauling will also be minimal. While existing dust generation has no noteworthy environmental impact on surround areas, dust should be controlled in the interest of improved worker health and safety. In this instance periodic wetting of the manoeuvring areas or even an annual application of a dust palliative can be considered. (No used oil or diesel is to be sprayed on the roadway for dust suppression).
<i>Noise</i>	None	The noise of the circular saws is within the norm and activities will only take place during normal working hours. The noise generated is considered minimal due to the short time frame, the small scale of the operations and the isolation of the site. Despite noise having no impact on other uses / public given the isolation of the site, continue to pursue methods of mining which reduce noise in the interest of worker health and safety.
<i>Archaeology:</i>	None	Cuttings will be made into consolidated solid rock with no possibility of fossils. The mitigation measures proposed in the phase 1 archaeological assessment will also be adhered to.
<i>Visual Impact:</i>	Potential significant impact	Will require mitigation refer paragraph 3.2
<i>Regional socio-economic structure</i>	Positive Impact	As far as possible, local labour will be used by the applicants. Stimulation of the supporting industries will naturally occur as many supplies will be obtained from the surrounding towns.

Potential impact during Mine closure and post operational waste Management

Impacts often continue long after the mine has stopped production and has been closed especially if site is un-rehabilitated.

Potential Activities	Applicable to operation
Decommissioning of roads	Slim possibility
Dismantling buildings	Not applicable
Reseeding/planting of disturbed areas	Not applicable
Re-contouring pit walls/waste dumps	Yes
Water quality treatment	Not applicable
Fencing dangerous areas	Yes
Monitoring of seepage	Yes
Potential environmental impacts	Category

Loss of productive land for alternative uses	Natural Vegetation
Subsidence, slumping and flooding of previously mined areas	Topography
Continuing discharge of contaminants to ground and surface water via seepage	Soil
Changes in river flow regimes with sharper flow peaks and reduced dry season flows	NA
Fauna and flora habitat loss and disturbance	Topography
Windborne dust	NA
Dangerous areas that pose health risks and possible loss of life (e.g. pits, ponds, etc.)	Topography

Successful implementation of the Environmental Management Program during the life of the mine will cover all the significant aspects affecting the environment.

3.1.3 Assessment of potential cumulative impacts.

The only cumulative impact that will remain after implementation of the mitigating measures will be the visual impact. This will only be the case if the complete outcrop is not removed and can be mitigated by sloping the cut face and by using ferry-oxide to camouflage the fresh cuts to blend in with the natural rock

3.2 Proposed mitigation measures to minimise adverse impacts.

3.2.1 List of actions, activities, or processes that have sufficiently significant impacts to require mitigation.

Waste management will be the major activity that has sufficiently significant impacts to require mitigation.

Mining will also have a significant impact on the topography and visual aspect of the generally flat topography. Due to the removal of the granite blocks an un-natural cut face of maximum 3 high remain.

3.2.2 Concomitant list of appropriate technical or management options

3.2.2.1 General requirements

Mapping and setting out

A copy of the layout plan as provided for in Regulation 2.2 must be available at the mining area for scrutiny when required.

The plan must be updated on a regular basis with regard to the actual progress of the establishment of surface infrastructure, mining operations and rehabilitation (a copy of the updated plan shall be forwarded to the Regional Manager on a regular basis). A final layout plan must be submitted at closure of the operation or when operations have ceased.

Demarcating of prospecting area

The mining area must be clearly demarcated by means of beacons at its corners, and along its boundaries if there is no visibility between the corner beacons.

Restrictions on mining

No owner or manager shall carry on any mining operations under or within a horizontal distance of a 100 meters from buildings, roads, or any structure whatever,

or under or within a horizontal distance of 100 meters from any surface which it may be necessary to protect, without first having given notice in writing to the Principle Inspector of Mines of his intention to do so and obtain his permission therefore.

No mine waste will be allowed to be deposited in natural drainage lines or erosion gullies without the necessary authorization from DWAF and a written permission from the DMD. Mining must be conducted in such a manner as to ensure that natural drainage lines are not destabilized and that surface and ground water quality is not impaired.

Responsibility

The environment affected by the mining operations shall be rehabilitated by the holder, as far as is practicable, to its natural state or to a predetermined and agreed to standard or land use which conforms with the concept of sustainable development. The affected environment shall be maintained in a stable condition that will not be detrimental to the safety and health of humans and animals and that will not pollute the environment or lead to the degradation thereof. It is the responsibility of the holder of the mining permit to ensure that the manager on the site and the employees are capable of complying with all the statutory requirements which must be met in order to mine, which includes the implementation of this EMP, the rehabilitation plan and the environmental awareness plan.

Establishing access road to the site

The access road to the mining area and the camp-site/site office must be established in consultation with the landowner/tenant and existing roads shall be used as far as practicable.

Should a portion of the access road be newly constructed the following must be adhered to:

- The route shall be selected that a minimum number of bushes or trees are felled and existing fence lines shall be followed as far as possible.
- Water courses and steep gradients shall be avoided as far as is practicable.
- Adequate drainage and erosion protection in the form of cut-off berms or trenches shall be provided where necessary.

The erection of gates in fence lines and the open or closed status of gates in new and existing positions shall be clarified in consultation with the landowner/tenant and maintained throughout the operational period.

No other routes will be used by vehicles or personnel for the purpose of gaining access to the site.

Construction

- Topsoil shall be removed from all virgin areas where physical disturbance of the surface will occur. The topsoil removed shall be stored in a bund wall on the high ground side of the mining area outside the 1: 50 flood level within the boundaries of the mining area.
- Topsoil shall be kept separate from overburden and shall not be used for building or maintenance of access roads.
- The topsoil stored in the bund wall shall be adequately protected from being blown away or being eroded.

Operation

- The liberation of dust into the surrounding environment shall be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents. The speed of haul trucks and other vehicles must be strictly controlled to

avoid dangerous conditions, excessive dust or excessive deterioration of the road being used.

- Regular maintenance of the access road shall be to the satisfaction of the Director: Mineral Development and the road shall have an acceptable surface, be free from erosion damage and have effective drainage, preventing the impounding/ponding of water.

On Closure

- Roads that will no longer be used shall be ripped or ploughed and if necessary, appropriately prepared to ensure the re-growth of vegetation.
- Materials, which may hamper re-growth of vegetation, must be removed prior to rehabilitation and disposed of in an approved manner.

General

- No vegetation will be removed to develop tracks as experience (by other prospectors) has shown that by not removing existing vegetation from area disturbed by traffic, the impact is that the vegetation is merely flattened and that such vegetation recovers quickly. Vehicles must use the same tracks and no haphazard turning in virgin veld is to be permitted.
- Try where possible to use existing road structures.
- Maintenance of access road on the mining area:
If trucks hauling concentrate or other traffic, which is associated with this mining operation, are the only user of access roads, then maintenance of the access road will be the sole responsibility of the holder of the prospecting right.
- In the case of dual or multiple uses of access roads by other users, arrangements for multiple responsibilities must be made with the other users. If not, the maintenance of access roads will be the responsibility of the holder of the prospecting right.
- Newly constructed access roads shall be adequately maintained so as to minimize dust, erosion or undue surface damage.

Establishing surface infrastructure - campsite/office, toilet facilities, waste water and refuse disposal and vehicle maintenance yard and secured storage areas

No camp or office site shall be located closer than 100 metres from a stream, spring, dam or pan.

Any vehicle maintenance yard and secured storage area will be established as far as is practicable, outside the flood plain, above the 1 in 50 flood level mark within the boundaries of the mining/prospecting area.

Chemical toilet facilities (preferred) or other approved toilet facilities such as a septic drain shall be used and sited on the camp site in such a way that they do not cause water or other pollution.

The vehicle maintenance yard and secured storage area will be established outside of the flood plain, above the high flood level mark within the boundaries of the prospecting right.

Construction

- The area chosen for these purposes shall be the minimum, reasonably required for the purpose, and which will involve the least disturbance to the vegetation.
- Prior to development of the approved area, the top seed-bearing layer of soil to a depth of 500 mm shall be removed and stored in a bund wall on the high ground side of the area. The height of this bund wall shall not exceed 1.5 metres.

- In cases where toilet facilities are linked to existing sewerage structures, all necessary regulatory requirements concerning construction and maintenance shall be adhered to.
- The storage areas/buildings shall be securely fenced and all hazardous substances and stocks such as diesel, oils, detergents etc. shall be stored therein. Drip pans, a thin concrete slab or a PVC lining shall be installed in such storage areas/ buildings viz. bunded area.
- The storage area shall be securely fenced and all hazardous substances and stocks such as diesel, oils, detergents, etc., shall be stored therein. Drip pans, a thin concrete slab or a facility with PVC lining, shall be installed in such storage areas with a view to prevent soil and water pollution.
- The location of both the vehicle maintenance yard and the storage areas are to be indicated on the layout plan.
- No vehicle may be extensively repaired in any place other than in the maintenance yard.
- Equipment used in the mining process will be adequately maintained so that during operations it does not spill oil, diesel, fuel, or hydraulic fluid.
- Machinery or equipment used on the mining area will not be allowed to constitute a pollution hazard in respect of the above substances.
- The Regional Manager may order such equipment to be repaired or withdrawn from use if he or she considers the equipment or machinery to be polluting and irreparable.

Operation

- All effluent water from the camp washing facility shall be disposed of in a properly constructed French drain, situated as far as possible, but not less than 100 metres, from a stream, river pan, dam or borehole.
- Only domestic type water shall be allowed to enter this drain and any effluents containing oil, grease or other industrial substances shall be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognised facility.
- Spills should be cleaned up immediately by removing the spills together with the polluted soil and disposing thereof at a recognised facility to the satisfaction of the regulators.
- Non-biodegradable refuse (such as glass bottles, plastic bags metal, scrap, etc.) shall be stored in a container at a collecting point and collected on a regular basis and disposed of at an authorised disposal facility. Precautions shall be taken to prevent any refuse from spreading on and from the campsite.
- Biodegradable refuse generated from the camp site, vehicle yard, storage area or any other area shall either be handled as above or be buried in a pit excavated for that purpose and by covering it with layers of soil, incorporating a final 0,5 metre thick layer of topsoil (if practical) or as specified by the local authority, if applicable.
- Suitable covered receptacles shall be provided and conveniently placed for waste disposal. All used oils, grease or hydraulic fluid shall be placed therein and these receptacles will be removed from the site on a regular basis for disposal at a recognized or licensed disposal facility.

On Closure

- On completion of mining, all buildings, structures or objects on the camp/office sites, shall be completely removed (unless new uses of the building have been agreed) and the site should be fully rehabilitated.

- On completion of prospecting, the campsite/office site will be rehabilitated through the removal of all facilities, waste and any other feature constructed or established during use of the campsite.
- All areas, devoid of vegetation/grass or where soils have been compacted due to traffic, shall be scarified or ripped and, if necessary appropriately ensure the regrowth of vegetation.
- French drains shall be compacted and covered with a final layer of topsoil to a height of 10 cm above the surrounding ground surface.

General

- Only one mobile chemical toilet will be available for use during operations that will be removed at final closure
- Equipment used in the mining process, must be adequately maintained, such that during operation they do not spill oil, diesel, fuel or hydraulic fluid.

Pollution Prevention Measures

- Domestic Waste Management Programmes

The owner will instruct the employees in the need for procedure/tasks as well as the actual handling of domestic waste, relating to domestic waste management.

Domestic waste (lunch wrappers, containers, food tins, bottles) of daily workers as well as the domestic waste from the mining logistics will be provided for and handled as follows:

- Provide waste collection drums at strategic points (workshops/personnel amenity area, residential and recreational facilities).
- Demarcate an area for and constructed as "temporary waste storage area" for temporary collection and storage of the drums, prior to delivery to municipal disposal site for disposal. (On-site dumping/burial is not allowed without registration/licensing of such a site with the Department of Water Affairs and Forestry in terms of the Environment Conservation Act).
- Instruct staff on the distinction between domestic refuse and industrial waste.

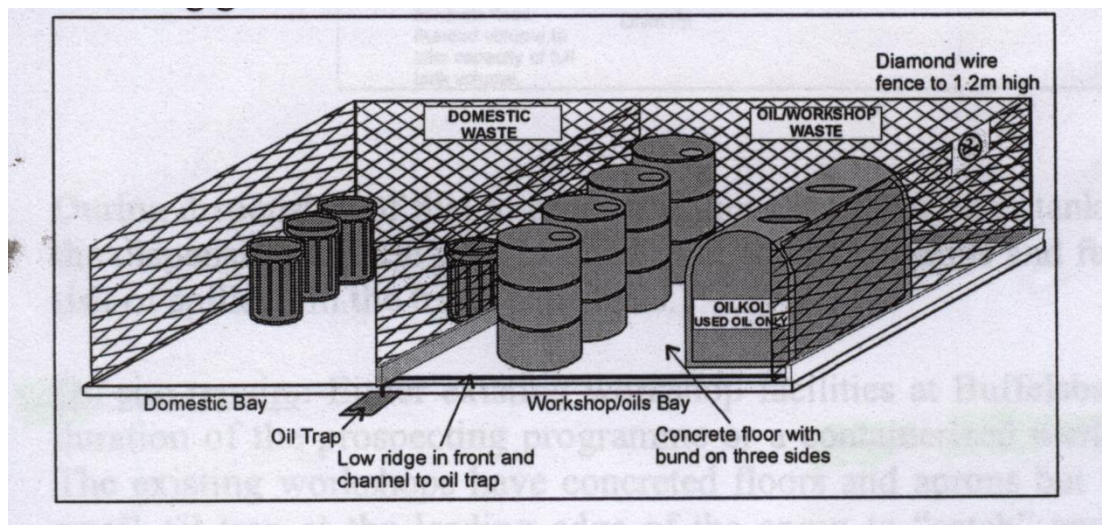
- Industrial Waste Management

Identify and demarcate (by fences) the following sites:

- A salvage yard for temporary storage of scrap steel and equipment prior to sale or removal as scrap. Arrange regular sale and collection of scrap from the site.
- A used oil collection and temporary storage area
- Temporary storage area for all used lubrication products and other hazardous chemicals (also refer Figure 1 below)

No engines or other equipment parts are to be stored in the scrap yard without either having had the oil drained or suitable measures have been taken to prevent leaking of oil.

Figure 1: Proposed layout of temporary waste storage area



- Diesel and Lubricant Handling Programme:

Refuelling:

Refuelling either of equipment or of the mobile trailer bowser must make use of a drip tray or PVC lining.

Generator bays need to be fitted with a steel tray equipped with a drain along its extremities to collect any oil and diesel contaminated run-off and channel it to the oil trap where separated oil will be collected and disposed of in the oil recycling container. Any oil spills is to be treated with Spillsorb or equivalent as per the product instructions.

Staff will require instruction in the identification of oil and diesel leaks, the operation of the oil trap (including the disposal of trapped oil) and use of Spillsorb (or equivalent) products. Training of employees needs to take place as part of the core work skills plan.

On-site repairs:

Only minor repairs will be done on site. A drip tray or PVC facility needs to be used when servicing equipment on site to prevent any oil spills. All moving equipment needs to be equipped with permanent drip trays to prevent oil spills. All major repairs will take place at the workshop in Pofadder. Waste oils from servicing of vehicles will be disposed of in the waste oil collection facility.

Contaminated spares, oil filters, gaskets, etc. will be collected in a separate drum at the designated storage facility for disposal at a suitable site off-site. Staff will require instruction in the:

- deleterious effects of oil /fuel on the environment
- identification and reporting of oil leaks
- the operation of the oil trap (including the disposal of trapped oil)
- location and method of the storage of contaminated spares and oil
- use of Spillsorb (or equivalent) products

Collection of contaminated spares and waste oils:

Contaminated spares, oil filters, gaskets, etc. will be collected in a separate drum at the designated storage facility for disposal at a suitable site off-site. Waste oils from servicing of vehicles will be disposed of in the waste oil collection facility.

Staff will require instruction in:

- deleterious effects of oil / fuel on the environment
- location and method of the storage of contaminated spares.

Temporary storage:

Used oils will be stored in drums provided by the oil recycling companies such as Oilkol. A concrete platform and fence with signposts is to be constructed to store used oil and drums containing used spares, cloths, etc. which are oil contaminated and must be temporarily stored for collection/dispatch to suitable regional disposal site. Staff will require instruction in:

- deleterious effects of oil / fuel on the environment
- location and method of the storage of contaminated spares and used oil.

Off-site disposal by a recycling company:

All waste oils must be collected in the facility for collection by a waste oil recycling company. Instruct the staff in the reasons for good fuel management and the alternative consequences. Identify area for citing of diesel bulk tank to remove fuel from delivery tanker truck - provide tank with bund wall and apron and construct used oil/lubricant collect/temporary storage point. Instruct staff in use of oil decontaminant procedure including:

- removal of contaminated soil in drums/bags to suitably licensed disposal dump,
- treatment of any residual contamination in situ with Spillsorb or similar decontaminant.

Occupational Health Awareness Programme:

This will form part of the company's Hazard Identification and Risk assessment and will be provided for in the code of practice (COP's)

3.2.2.2 Construction phase

No permanent infrastructure or roads will be constructed due to the small scale of operations. No processing will take place that need infrastructure to be constructed.

The construction phase relates to the construction of:

- Storage area in the form of mobile containers.
- Temporary storage area for domestic and industrial waste including facilities for oil and fuel waste handling.
- Scrap yard for temporary storage of scrap steel and equipment prior to sale.
- Generator bay - with diesel spill floor or steel tray

The following is the mitigating and/or management measures for all the significant impact identified with regard to the construction phase according to the different environmental aspects.

Topography

The mine is responsible for the maintenance and upgrading of all services but it will still be needed by the landowner at final closure.

On completion of mining operations, the vehicle maintenance yard and secured storage's areas shall be cleared of any contaminated soil. The surface shall then be ripped or ploughed to a depth of at least 300 mm and the topsoil previously stored adjacent the site, shall be spread evenly to its original depth over the whole area.

Progressive maintenance and upgrading of all services will take place and in the case of temporary closure, sudden closure during the normal operation of the project or at final planned closure there must be no outstanding rehabilitation.

Natural vegetation /Plant life

As far as possible, existing roads would be used to access the mining area. The area to be disturbed by infrastructure is small and it is proposed to remove the 300mm topsoil with vegetation content to a berm. The berm is to be limited to 2m in height in order to retain a viable seed bank. In addition, by locating the berm uphill of the excavation, the berm will act as a storm water control ridge in the unlikely event of surface water sheet flow.

The following general aspects will be implemented to reduce any potential impact:

- Movement and stockpile areas will be clearly demarcated and any movement outside of these areas must not be allowed
- No ad hoc roads, dumping or topsoil borrowing
- The area to be disturbed must be kept to the minimum required and it is proposed to remove the 30cm topsoil with vegetation content to a berm.
- No wood collected in the surrounding area will be allowed and cooking equipment, gas and paraffin must be supplied to the workers on the site.
- Invader species will be handled in terms of CARA and NEMBA as part of the land owners alien invasive control program.

Visual aspects

Progressive maintenance and upgrading of all infrastructures will take place and in the case of temporary closure, sudden closure during the normal operation of the project or at final planned closure there must be no outstanding rehabilitation.

At final closure all equipment will be removed and after implementation of the mitigating measures described under the heading topography the visual impact of the mining operation will be minimal.

3.2.2.3 Operational phase

Mining will consist of the removal of the granite blocks that will create an un-natural cut face of maximum 3 high remain. If the outcrop is removed completely the impact will be zero as the topography will be flat and blend in with the surrounding topography.

The following is the mitigating and/or management measures for all the significant impact identified with regard to the construction phase according to the different environmental aspects.

Topography

Mining will have a significant impact on the topography. If a cut face remain waste blocks will have to be stacked against the face to reduce the height and ferri-oxide will be used to alter the colour of the cut rock so it blend in with the natural rock.

Waste rock will be over rolled from the outcrop so that it follows the natural contour of the outcrop. The larger blocks will be covered by finer rock and covered by topsoil that were used to create the working benches as mining progresses down the outcrop.

Those aspects that will require attention during the final decommissioning phase are listed below:

- Any stockpiles left must be removed or backfilled in excavations.
- Waste blocks needs to be stacked against any remaining high wall to reduce the overall height to less than 3 meters.
- Scarifying of all compacted areas including the stock pile and dressing yard.
- Level and shape the excavations and stock pile platforms.

- Remove all power supply installations including generators and demolish generator bays and footings.
- Remove all water installations including pumps and pipelines.
- All internal roads need to be ripped except for the ones still needed by the landowner; this also includes repairs to all fences and gates.
- Provision of efficient storm water control to prevent erosion of steep slopes and roadways and elsewhere are required
- All equipment and other items used during the prospecting operation needs to be removed from the site.
- Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from the mining area and disposed of at a recognised landfill facility. It will not be buried or burned on the site.
- The only mitigating measure that needs to be implemented is to level the area and restore the original profile

Natural vegetation /Plant life

Very little natural vegetation is present on the granite dome to be mined. The area to be disturbed for stockpiling and storage areas must be kept to the minimum required and it is proposed to remove the 30cm topsoil with vegetation content to a berm. The berm is to be limited to 2m in height in order to retain a viable seed bank. In addition, by locating the berm above the development the berm will act as a storm water control ridge in the unlikely event of surface water sheet flow.

The following general aspects must be implemented to reduce any potential impact:

- Movement areas must be clearly demarcated and any movement outside of these areas must not be allowed
- No ad hoc roads, dumping or topsoil borrowing
- Topsoil if directly re-used has immediate re-vegetation results given the seed bank present in the topsoil.

Visual aspects

Due to the change in topography there is a significant impact on visual aspects. This impact can be increased with the absence of an adequate waste management system. The mining area is not readily visible from any main through fare.

At final closure all equipment will be removed. The management and mitigating measures with regard to topography will also address the visual impact.

3.2.2.4 Decommissioning phase

Residual Impacts after Closure

It is envisaged that at the time of project mine closure the total area will be stable so long term stability is not an issue.

The potential for acid mine drainage or poor quality leachates emanating from the mine or residue deposits are minimal as the rocks affected by the mining activities are inert and will not be detrimental to any aquifer present.

Any sediment caught up in rain run-off water will be trapped in settling ponds constructed for this purpose and recycled. The mitigating measures as described will be sufficient to address all impacts and the only residual impact after closure will be on the visual aspect but it will be mitigated to the effect that the impact can be regarded as insignificant.

Aftercare

As the final phase in the project cycle, decommissioning may present positive environmental opportunities associated with the return of the land for alternative use and the cessation of impacts associated with operational activities. However, depending on the nature of the operational activity, the need to manage risks and potential residual impacts may remain well after operations have ceased. Examples of potential residual impacts and risks include contamination of soil and groundwater, stock that has been abandoned (e.g. oil drums, scrap equipment, old chemicals) and old (unserviceable) structures. The closure plan to be submitted at final closure will provide specific guidance with respect to the management of the environmental risks associated with the decommissioning stage of a project.

Unauthorized entry will be taken very seriously during final closure and traffic onto the property will be kept to a minimum. Regular monitoring of the effectiveness of environmental management and mitigating measures implemented during the post mining decommissioning phase will continue until a closure certificate is issued.

3.2.3 Review the significance of the identified impacts

The mitigating measures as described will be sufficient to address all impacts and the only residual impact after closure will be on the visual aspect but it will be mitigated to the effect that the impact can be regarded as insignificant.

4 REGULATION 52 (2) (d): Financial provision.

4.1 Plans for quantum calculation purposes.

Progressive rehabilitation is good practice and has advantages for both the company and the community. From the perspective of the company it reduces its overall financial exposure and may reduce the amount of the bond. From the perspective of the community progressive rehabilitation provides confidence in the rehabilitation process as well as reducing the scale of the mining site.

Rehabilitation has now become one of the most important considerations when designing and operating a mine. Not only the visual impact of overburden and tailings dumps is considered, but also excavations and their visual impact and the change in land use are considered.

In order to minimize the impact on the environment rehabilitation will take place on a continuous basis together with prospecting.

Operations are conducted in an area that has already been disturbed, and the holder has reach specific agreements with the Regional Manager concerning the responsibilities imposed upon them pertaining to the rehabilitation of the area and the pollution control measures to be implemented and the company is responsible for all surface disturbances on the prospecting area, which includes all historical surface disturbances within the boundaries of this application area.

4.2 Alignment of rehabilitation with the closure objectives

The goal of rehabilitation with respect to the area where prospecting will take place is to leave the area level and even, and in a natural state containing no foreign debris or other materials.

All scrap and other foreign materials will be removed from the area and disposed of as in the case of other refuse, whether these accrue directly from the prospecting operation or are brought on to the site.

Removal of these materials shall be done on a continuous basis and not only at the start of final rehabilitation and closure.

The area will be profiled to blend in with the topography of the surrounding environment. The mitigating measures described in paragraph 3 are compatible with these closure objectives.

4.3 Quantum calculations.

Rehabilitation of infrastructure areas

No infrastructure area will be developed except for waste management that will mostly consist of mobile containers. The infrastructure at the farmstead is leased as part of this mining operation.

Successful implementation of the Environmental Management Program during the life of the mine will cover most of the significant aspects affecting the environment.

Unwanted steel, sheet metal and equipment in the salvage yard needs to be sold or disposed of as scrap metal. There will only be three month worth of scrap present at any time to be dealt with.

1 X 20m ³ dumper truck for transport of scrap to Pofadder	R 6 250.00
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Manual labour - Demolishing and loading of scrap 4 hour @ R500/hour	R 2 000.00
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All waste in the temporary storage area for used lubrication products and other hazardous chemicals needs to be disposed of at a collection point in Pofadder from where it will be collected by a waste recycling company. There will only be three month worth of waste products present at any time to be dealt with.

1 X 1 ton pic up for transport of waste to Springbok	R 1 250.00
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Manual labour - loading of waste and final clean-up 2 hour @ R500/hour	R 1 000.00
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Sub Total Infrastructure	R 10 500.00
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Rehabilitation of surface disturbance

The total amount of waste will be approximately 4000 m³ over the lifetime of the mine and an estimated 1000 m³ waste blocks from the stockpile area.

Although some of the waste blocks were removed the rehabilitation cost is still estimated for 5 000 m³ waste.

Stacking of waste blocks 5 000 m ³ @ R10/m ³	R 50 000.00
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Levelling and profiling of waste dump 3Ha @ R7 900.00/Ha	R 23 700.00
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Temporary Infrastructures to be demolish, removed and rehabilitated 40m ³ @ R15.50/m ³	R 620.00
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Lowbed from Pofadder	R 4 500.00
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Sub Total surface disturbance	R 78 820.00
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Final rehabilitation

Remove all power supply installations including generators and demolish generator bays and footings. Remove all water installations including pumps and pipelines. All equipment and other items used during the mining operation needs to be removed from the site. Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from the mining area and disposed of at a recognised landfill facility. It will not be buried or burned on the site.

1 X 20m ³ dumper truck for transport of scrap and equipment	R 6 250.00
--	------------

Manual labour - Demolishing and loading of scrap final clean-up 4 hour @ R500/hour	R 2 000.00
---	------------

Scarifying of all internal access roads within this mining block also needs to take place. Provision of efficient storm water control to prevent erosion of steep slopes and roadways and elsewhere are required

Equipment required:

Caterpillar 140 G for ripping

2 hours @ R650.00/hour R 1 300.00

Manual labour - erosion control measures

2 hour @ R500/hour R 1 000.00

Sub Total Final Rehabilitation R 10 550.00

Total estimated cost for requirements to fully decommissioned the site

Rehabilitation of infrastructure areas R 10 500.00

Rehabilitation surface disturbance R 78 820.00

Final rehabilitation R 10 550.00

Total R 99 870.00

4.4 Undertaking to provide financial provision

Financial provision required under Regulation 54 for the amount of R 100 000.00 will be furnish to DME. The quantum will be updated again within a year or at a shorter interval if there is any deviation from the prospecting work program.

4.5 Timeframes to fully decommission the site

Successful implementation of the Environmental Management Program during the life of the project will cover most of the significant aspects affecting the environment. The rehabilitation of the inherited liabilities will be addressed together with production. Final closure will be completed within six month after lapsing of the permit in terms of the MPRDA and after care will continue until a closure certificate has been issued

5 REGULATION 52 (2) (e): Planned monitoring and performance assessment of the environmental management plan.

5.1 List of identified impacts requiring monitoring programmes.

None of the impacts identified required specific monitoring programs but a second closure objective is to ensure that the rehabilitation and mitigating measures applied during operation prove successful. The only way to accomplish this is by regular monitoring. Monitoring on all the environmental issues as discussed in the EMPR will be carried out on a regular basis. This includes monitoring of waste handling, the re-vegetation process, erosion and the effect of windblown sand and/or dust. Any unforeseen impact or ineffective management measures that are identified during monitoring will be addressed as an addendum to the EMPR.

5.2 Functional requirements for monitoring programmes

Every aspect of the operation must be checked against the prescriptions given in this document and if find that certain aspects are not addressed or impacts on the environment are not mitigated properly, the identified inadequacies will be rectified immediately.

Regular monitoring of all the environmental management measures and components shall be carried out to ensure that the provisions of this program are adhered to.

Layout plans will be updated on a regular basis and updated copies will be submitted on an annual basis to the Regional Manager.

Reports confirming compliance with various points identified in this program will be submitted to the Regional Manager on an annual basis together with an update of the rehabilitation cost. Any emergency or unforeseen impact will be reported as soon as possible. An assessment of environmental impacts that were not properly addressed or were unknown when the program was compiled shall be carried out and added as a corrective action.

5.3 Roles and responsibilities for the execution of monitoring programmes

The project manager will be responsible for monitoring and Reports confirming compliance with various points identified in the environmental management program.

5.4 Committed time frames for monitoring and reporting

The project manager must on a bi-monthly basis, check every aspect of the operation against the prescriptions given in this document and, if find that certain aspects are not addressed or impacts on the environment are not mitigated properly, the project manager must rectify the identified inadequacies immediately.

6 REGULATION 52 (2) (f): Closure and environmental objectives.

Internationally, there seem to be three schools of thought:

- “What the affected community wants, the affected community gets” – that is, the key focus is on providing the end product requested by the affected communities, rather than focusing on the previous status quo of the receiving environment
- “Restoration of previous land use capability” – the original thought process in the South African context, because mining often occurs on land with high agricultural potential
- “No net loss of biodiversity” – the focal point in the ICMM/IUCN dialogue sponsored guidelines for mining and biodiversity, and of many mining corporate policies.

The thought process for the closure of this operation is based on the last two. The main closure objective therefore is to leave the site in as safe and self-sustaining a condition as possible and in a situation where no post-closure intervention is required.

The aim is to ensure that the affected environment is maintained in a stable condition that will not be detrimental to the safety and health of humans and animals and that will not pollute the environment or lead to the degradation thereof. The aesthetic value of the area will also be reinstated.

Successful implementation of the Environmental Management Program during the life of the operation will cover most of the significant aspects affecting the environment. The sample areas will be the only outstanding rehabilitated at final closure

7 REGULATION 52 (2) (g): Record of the public participation and the results thereof.

7.1 Identification of interested and affected parties

The only interested and affected party is deemed to be the landowner and consultation has taken place by means of a meeting.

All other interested parties were invited to comment on the proposed project by means of an advertisement in the local newspaper.

7.2 The details of the engagement process

7.2.1 Description of the information provided to the community, landowners, and interested and affected parties.

The consultation report was made available to all interested and affected parties.

7.2.2 List of which parties identified in 7.1 above that were in fact consulted, and which were not consulted.

The only interested and affected party is deemed to be the landowner and consultation has taken place by means of a meeting.

All other interested parties were invited to comment on the proposed project by means of an advertisement in the local newspaper.

7.2.3 List of views raised by consulted parties regarding the existing cultural, socio-economic or biophysical environment.

No views or comment received

7.2.4 List of views raised by consulted parties on how their existing cultural, socio-economic or biophysical environment potentially will be impacted on by the proposed prospecting or mining operation

No views or comment received

7.2.5 Other concerns raised by the aforesaid parties

No views or comment received

7.2.6 Confirmation that minutes and records of the consultations are appended

The consultation report together with copies of the communication with interested and affected parties was uploaded on the SAMRAD system as part of this application.

7.2.7 Information regarding objections received.

No objections against the proposed prospecting operation that need to be dealt with by the REMDEC committee were received. All comments received were addressed as part of the EMP.

7.3 The manner in which the issues raised were addressed.

No objections against the proposed prospecting operation received

8 SECTION 39 (3) (c) of the Act: Environmental awareness plan.

8.1 Employee communication process

General environmental awareness will be fostered among the project's workforce to encourage the implementation of environmentally sound practices throughout its duration. This will ensure that environmental accidents are minimized and environmental compliance maximized.

Environmental awareness will be fostered in the following manner:

- a) Induction course for all workers on site, before commencing work on site.
- b) Refresher courses as and when required
- c) Daily toolbox talks at the start of each day with all workers coming on site, where workers can be alerted to particular environmental concerns associated with their tasks for that day or the area/habitat in which they are working.
- d) Taking part in national and international environmental campaigns like National Marine Week, National harbour day, National Wetlands day exacta.
- e) Displaying of information posters and other environmental awareness material in the general assembly points.

8.2 Description of solutions to risks

Specific environmental awareness performance criteria will form part of the job descriptions of employees, to ensure diligence and full responsibility at all levels of the organisational work force.

General environmental awareness will be fostered among the project's workforce to encourage the implementation of environmentally sound practices throughout its duration. This will ensure that environmental accidents are minimized and environmental compliance maximized.

8.3 Environmental awareness training.

The goal of training is to enable a shared understanding and common vision of the environment, the impact of a mining operation on the environment (and why this is important) and the role of mining personnel in terms of environmental management and compliance.

The induction course will compose of the following steps:

- The first step will include background discussion of the environment concept: of what it comprises and how we interact with it.
- The second step will be a description of the components and phases of the specific mining operation.
- The third step will be a general account of how the mining operation and its associated activities can affect the environment, giving rise to what we call Environmental Impacts.
- The fourth and most important step will be a discussion of what staff can do in order to help prevent the negative environmental impacts from degrading our environment. This is known as Environmental Impact Management.

9 SECTION 39 (4) (a) (iii) of the Act: Capacity to rehabilitate and manage negative impacts on the environment.

9.1 The annual amount required to manage and rehabilitate the environment.

A budget of R210 000 per year was made available for mitigating environmental impacts as part of production including compliance reporting, updating of layout plans and performance assessment on the implementation of the EM Programme and update of quantum of financial provision. This amount will also be adequate for progressive rehabilitation of the mining operation. In addition to this amount for progressive rehabilitation a financial guarantee of R100 000 will be supplied to DMR for final rehabilitation and closure of the operation.

9.2 Confirmation that the stated amount correctly reflected in the Mining Programme as required.

This amount was provided for in the cost estimate for the implementation of the mining operation and proof of access to the necessary funds were supplied with the application for the mining permit.

10 REGULATION 52 (2) (h): Undertaking to execute the environmental management plan.

Herewith I, the person whose name and identity number is stated below, confirm that I am the person authorised to act as representative of the applicant in terms of the resolution submitted with the application, and confirm that the above report comprises EIA and EMP compiled in accordance with the guideline on the Departments official website and the directive in terms of sections 29 and 39 (5) in that regard, and the applicant undertakes to execute the Environmental management plan as proposed.

Full Names and Surname	Franco D'Agnolo
Identity Number	5010245023183

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