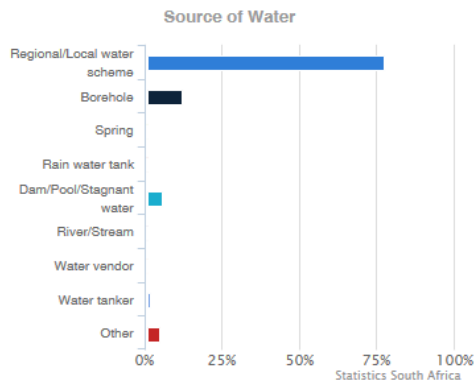


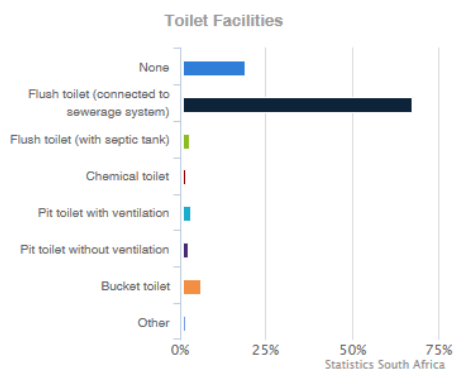
Tenure Status	Percentage
Rented	24,3%
Owned and fully paid off	40,4%
Owned but not yet paid off	4,3%
Occupied rent free	26,4%
Other	4,5%

○ **Source of water**



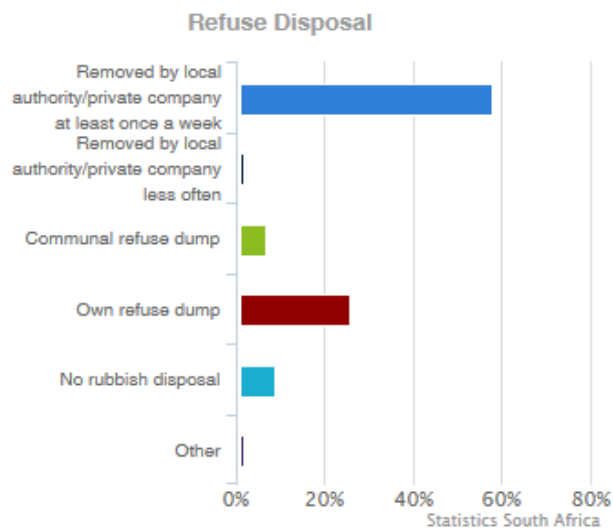
Source of water	Percentage
Regional/Local water scheme (operated by municipality or other water services provider)	76,7%
Borehole	11,7%
Spring	0,1%
Rain water tank	0,1%
Dam/Pool/Stagnant water	5,1%
River/Stream	0,1%
Water vendor	0,2%
Water tanker	1,5%
Other	4,4%

○ **Toilet facilities**



Toilet Facility	Percentage
None	18,3%
Flush toilet (connected to sewerage system)	66,7%
Flush toilet (with septic tank)	2,2%
Chemical toilet	1,2%
Pit toilet with ventilation	2,6%
Pit toilet without ventilation	2%
Bucket toilet	5,6%
Other	1,4%

○ **Refuse disposal**

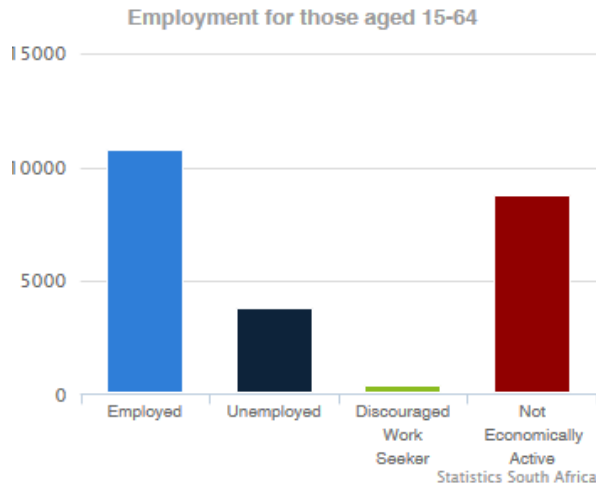


Refuse Disposal	Percentage
Removed by local authority/private company at least once a week	57,4%
Removed by local authority/private company less often	1,3%
Communal refuse dump	6,4%
Own refuse dump	25,4%
No rubbish disposal	8,3%
Other	1,3%

- **Economy**

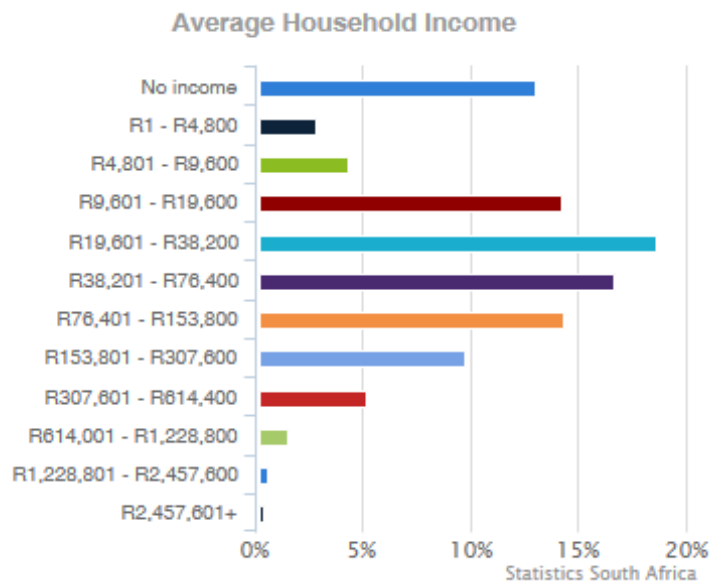
Economically Tsantsabane is known for being rich in minerals, and for its mining, agriculture, manufacturing and farming sectors. Tsantsabane has reinvented itself over the years as one of the leading investment hot spots in the Northern Cape.

- **Employment**



Employment Status	Number
Employed	10760
Unemployed	3795
Discouraged Work Seeker	419
Not Economically Active	8764

- **Average household income**

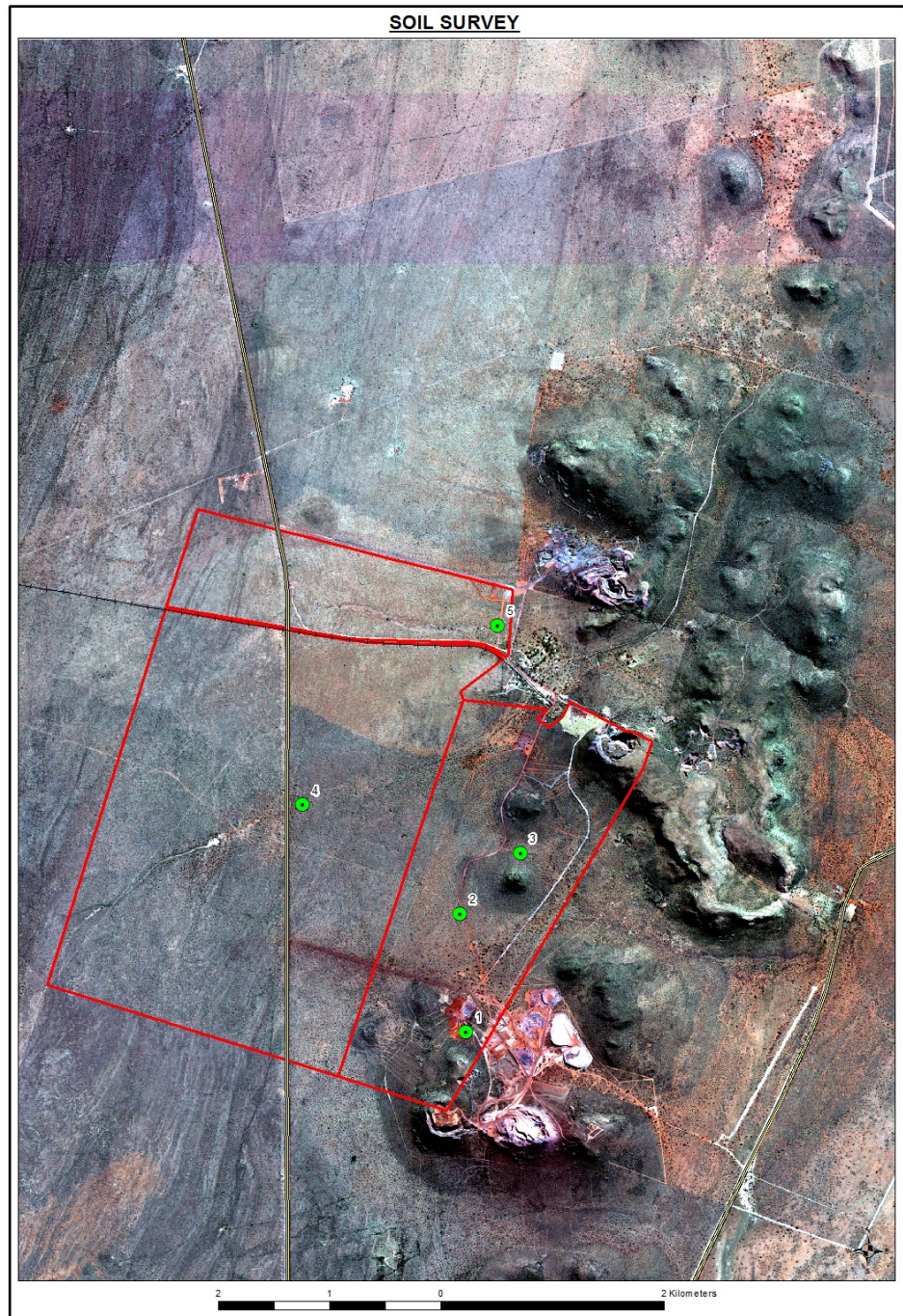


Income	Percentage
None income	12,9%
R1 - R4,800	2,7%
R4,801 - R9,600	4,2%
R9,601 - R19,600	14,1%
R19,601 - R38,200	18,5%
R38,201 - R76,4000	16,5%
R76,401 - R153,800	14,2%
R153,801 - R307,600	9,6%
R307,601 - R614,400	5,1%
R614,001 - R1,228,800	1,4%
R1,228,801 - R2,457,600	0,5%
R2,457,601+	0,3%

**1.1.11. Soil:**

**Mr. G.P. Stemmet conducted a soil study of the application area. Find attached hereto as Annexure 'J' his report.**

Name	Coordinate	
	East	South
<b>Profile Hole 1</b>	<b>23°5'44.914"</b>	<b>28°11'5.676"</b>
<b>Profile Hole 2</b>	<b>23°5'43.875"</b>	<b>28°10'31.743"</b>
<b>Profile Hole 3</b>	<b>23°6'1.188"</b>	<b>28°10'13.737"</b>
<b>Profile Hole 4</b>	<b>23°4'58.169"</b>	<b>28°10'0.233"</b>
<b>Profile Hole 5</b>	<b>23°5'54.609"</b>	<b>28°9'8.641"</b>



*Figure 22 - Locality of profile holes*

Soil sampling was carried out according to internationally accepted practices. The practices employed included:

- Five profile holes dug with JCB.
- The ground surface at the position of the profile hole was carefully cleared of loose material. When present, surface vegetation was carefully removed and the soil clinging to any roots left behind collected with the surface soil sample.
- The 5 profile holes were distributed over the complete study area and the location of each profile hole logged by GPS.

- Soil samples were taken from all of the profile holes, placed in clean, clearly labelled bags and sent to a laboratory for analyses.

The five profile holes' soil samples were sent for analyses by Omnia, but the results have not yet been received.

- **Profile hole 1**  
This profile hole is located relatively high on the ridge, in the vicinity of an old mine excavation. The profile consists of a dark-brown soil of the Orthic A Horizon, 200mm on top of a deep lithocutanic B Horizon of the Glenrosa Form of the Dumisa Family. The profile consists of many loose rocks, is non-calcareous, has an estimated 20% clay content and has no signs of wetness. Very good root penetration was visible.
- **Profile hole 2**  
This profile hole is located in the lower lying valley area. The profile consists of a dark-redbrown soil of the Orthic A Horizon, 400mm on top of a deep dark-red B Horizon of the Hutton Form of the Stella Family. The profile has light structure with an estimated 15% clay content. Very good root penetration was visible.
- **Profile hole 3**  
This profile hole is located in a bushy area, between two ridges. The profile consists of a dark-redbrown soil of the Orthic A Horizon, 500mm on top of a deep (1000mm) dark-red Eutrophic B Horizon of the Hutton Form of the Stella Family. The profile consists of many loose rocks and has an estimated 18% clay content. Very good root penetration was visible.
- **Profile hole 4**  
This profile hole is located in the valley area. The profile consists of a shallow dark-red soil of the Orthic A Horizon, on top of a 400mm red Apedale B Horizon of the Hutton Form of the Stella Family. The profile is situated on a hard rock stratum and has an estimated 20% clay content. Very good root penetration was visible.
- **Profile hole 5**  
This profile hole is located on a slope adjacent to a drainage channel leading from the higher lying ridges. The profile consists

of a dark-red soil of the Orthic A Horizon, on top of a 400mm red B Horizon of the Hutton Form of the Stella Family. The profile consists of many loose rocks, has an estimated 20% clay content and has low alkali content. Very good root penetration was visible.

**1.1.12. Sensitive Landscapes**

"Sensitive environments" that have statutory protection are the following:

- Limited development areas (Section 23 of the Environment Conservation Act, 1989 (Act 73 of 1989)).
- Protected natural environments and national heritage sites.
- National, provincial, municipal and private nature reserves.
- Conservation areas and sites of conservation significance.
- National monuments and gardens of remembrance.
- Archaeological and palaeontological sites.
- Graves and burial sites
- Lake areas, offshore islands and the admiralty reserve.
- Estuaries, lagoons, wetlands and lakes.
- Streams and river channels, and their banks.
- Dunes and beaches.
- Caves and sites of geological significance.
- Battle and burial sites.
- Habitat and /or breeding sites of Red Data Book species.
- Areas or sites of outstanding natural beauty.
- Areas or sites of special scientific interest.
- Areas or sites of special social, cultural or historical interest.
- Declared national heritage site.
- Mountain catchment areas.
- Areas with eco-tourism potential.

Sensitive landscapes on the application area were identified as follows:

- Grave site
- Walling sites
- Camel Thorn Trees / Wild Olive Trees & Shepherds' Trees
- A number of small non-perennial drainage lines

No mining will be allowed within 20m from the centre point of the archaeological findings. No mining will be allowed within 20m from any non-perennial drainage line.

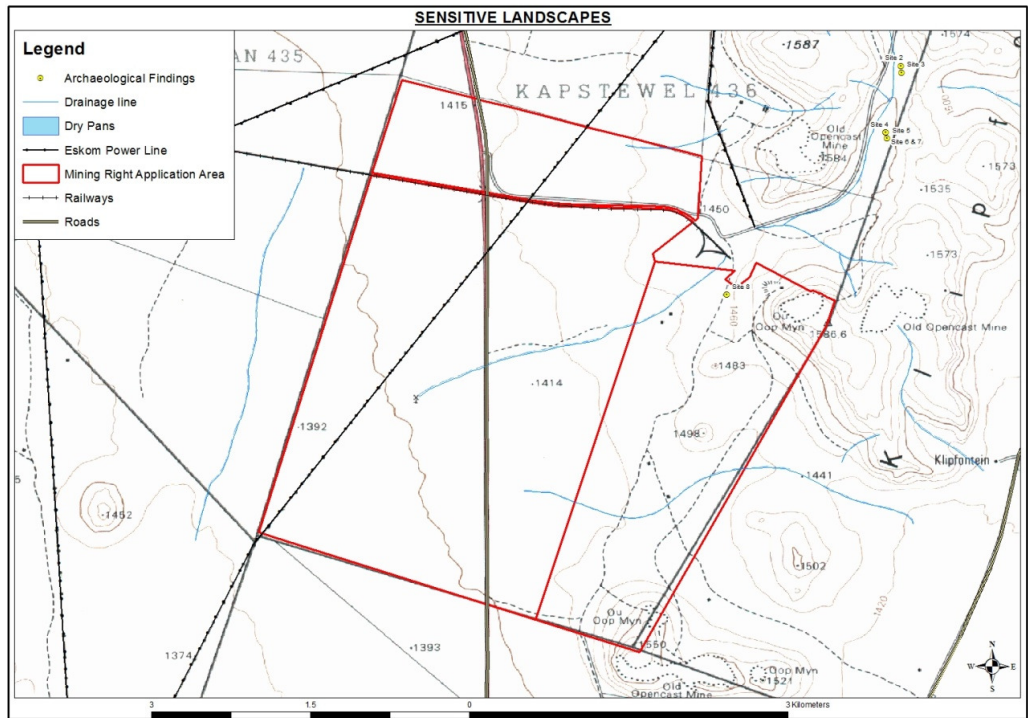


Figure 23 - Sensitive landscapes

1.1.13. **Surface Water:**

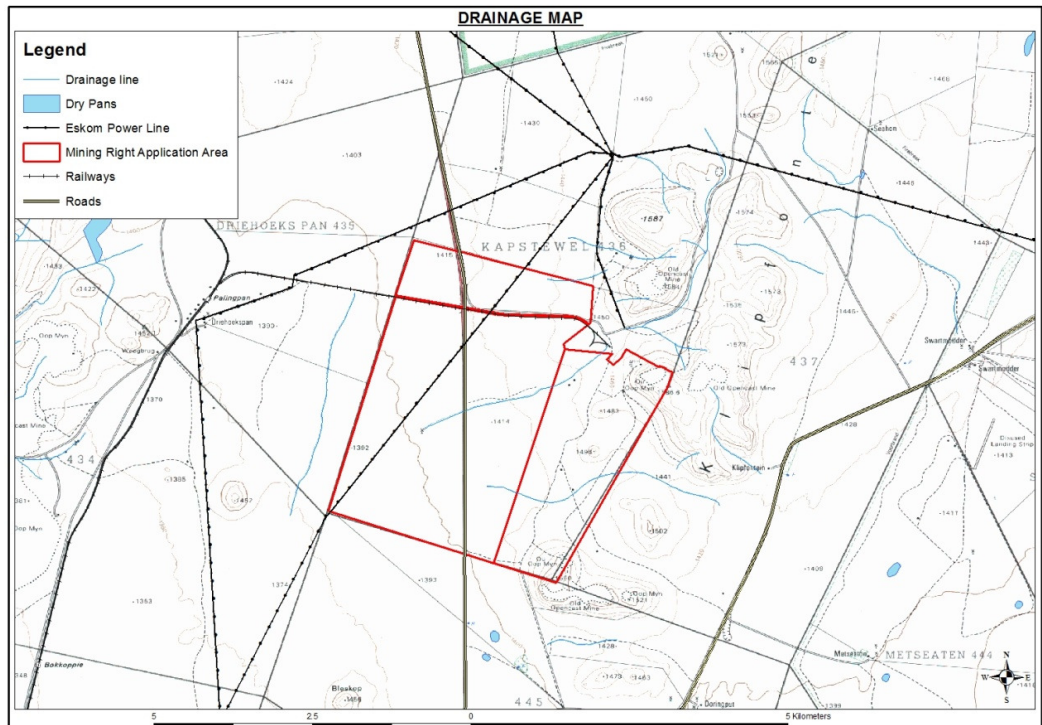


Figure 24 - Drainage Map



- **Catchment:**  
The development is located in the quaternary catchment area D73A - part of the Lower Vaal Management Area. The mining area falls in catchment area 10.

- **Surface water found on the property and immediate surroundings:**  
Some insignificant, non-perennial drainage channels, which drain surface water from the mining area in a southerly direction towards the Groenwaterspruit, occur in the area. North-west of the mining area the drainage changes to a north-westerly direction towards the Ga-Mogara River.

There are a few dry pans in the immediate surrounding area.

- **Mean annual run-off and normal dry weather flow:**  
Surface run-off only occurs during short periods of exceptional rainfall or days with more than 10mm of precipitation. This can be expected as the annual rainfall is below 400mm and the annual evaporation is 2700mm to 3700mm. Using an average of 13 days per year with rainfall of more than 10mm will result in a rainfall of 130mm/year that will lead to a 10% run-off.
- **River diversions:**  
No alteration of any water courses or the natural drainage lines will take place on the site. No infrastructure development will be allowed within the 1:50 year floodline or within 20m of the drainage line (whichever is the greater).
- **Surface water quality:**  
There is no surface water found on the application area, nor in the immediate surrounding area.
- **Water authority:**  
The provincial Department of Water Affairs in Kimberley has authority over the underground and surface water resources and the specific area falls under the Lower Vaal Water Management area. The Tshiping Water User Association assists DWA in managing the area.

- **Wetlands:**  
No wetlands occur on the site.

#### 1.1.14. **Topography:**

The elevation of the study area varies between 1,588mamsl along the Klipfontein Hills on the eastern side and 1,400mamsl at the western boundary of the site. Hills on the eastern side of the site are rugged with relatively steep slopes.

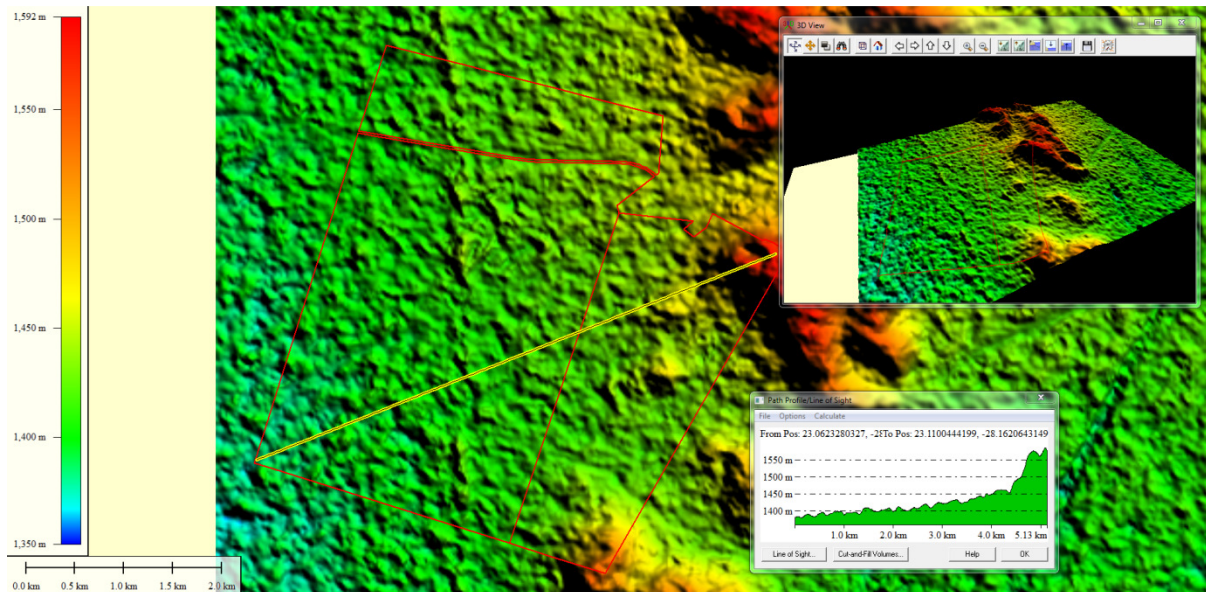


Figure 25 - 3D Image of the application area from Global Mapper

#### 1.1.15. **Visual:**

- The application area is visible from the R325 between Postmasburg and Kathu. Mining operations on the ridge area will be highly visible to the surrounding areas. The topography of the ridge will be altered by the mining operation. It will none-the-less be aesthetically pleasing and will comply with the relevant legislation.
- **Visibility of the mining area from residential areas**  
The site is visible to the surface owners' residences.

- 1.2. Concise description of each of the existing environmental aspects both on the site applied for and in the surrounding area which may require protection or remediation.

**As indicated in the abovementioned specialist reports the following environmental aspects require protection and / or remediation:**

- **Archaeological artefacts - Any area containing archaeological artefacts must be protected.**
- **Burial grounds and graves - Any area containing burial grounds and graves must be protected.**
- **Buildings and structures older than 60 years and / or walling sites - Any area containing buildings and/or structures older than 60 years and walling sites must be protected.**
- **Natural drainage lines - Some insignificant, non-perennial drainage channels, which drain surface water from the mining area in a southerly direction towards the Groenwaterspruit, occur in the area. No mining will be allowed within 20m from any natural drainage line.**
- **Camel Thorn Trees, Wild Olive Trees & Shepherds Trees - A relevant permit will be obtained from the Department of Environmental Affairs before any Camel Thorn Tree is removed.**

**The main remediation proposed is the rehabilitation of mined areas to ensure that land capability returns to its current state.**

- 1.3. Concise description of the specific land uses, cultural and heritage aspects and infrastructure on the site and neighbouring properties/farms in respect of which the potential exists for the socio-economic conditions of other parties to be affected by the proposed mining operation.

- **Specific land uses:**  
Land use management can be a significant issue. Development plans (IDP & SDF) considers the study area and other development plans, agricultural development and adjacent land use to the mine area.

**The destruction of the vegetation cover by the mining activities would temporarily impact on certain areas of the property, which could lead to loss of income by livestock farming.**

- **Cultural and heritage aspects:**  
Archaeological artefacts - Any area containing archaeological artefacts must be protected. All areas containing archaeological artefacts have been logged and no mining will be conducted within 20m from their midpoint. No impact is expected.

Burial grounds and graves - Any area containing burial grounds and graves must be protected. All burial sites and graves on the property have been logged and no mining will be allowed within 10m of any site.

Buildings and structures older than 60 years and / or walling sites - Any area containing buildings and/or structures older than 60 years and walling sites must be protected. All structures have been logged and no mining will be allowed within 20m from these structures.

- **Infrastructure:**

- There is a single line Eskom power line traversing the property from the north to the west. An Eskom sub-station is found approximately 2km north of the mine boundary.
- The R325 between Postmasburg and Kathu traverses the application area from the south to the north.
- Access to the site and surrounding properties is by a secondary gravel road (1.5km from the R325 to the entrance gate of the application area) turning right from the R325. There are a number of gravel roads traversing the property, which were not created by the mining operation.
- There are a few farm roads on the property, which are utilized by the surface owners.
- There are a small number of windmills, for livestock watering, on the application area.

- **Other economic impacts**

Measures of economic impacts can be used to demonstrate the potential effect of the proposed mining operation on the local economy:

- **Employment** - The extent of employment can be measured as number of jobs or in terms of full time equivalents.
- **Employment of contractors**
- **Provision of skills development**
- **Opportunities for local SMME's**
- **Community involvement**
- **Poverty alleviation**
- **Payroll income** - The gross remuneration of employees in terms of salaries and wages.
- **Capital Expenditure (CAPEX)** - The total amount spent on the purchasing of fixed assets and total spent on construction.
- **Operating expenditure and maintenance (OPEX)** - The total amount spent locally by businesses on goods and services, excluding salaries and wages as well as rents or interest.
- **Revenue** - The total value of sales arising from business activity at the mine.

Annotated map showing the spatial locality and aerial extent of all environmental, cultural/heritage, infrastructure and land use features identified on site and on the neighbouring properties and farms.

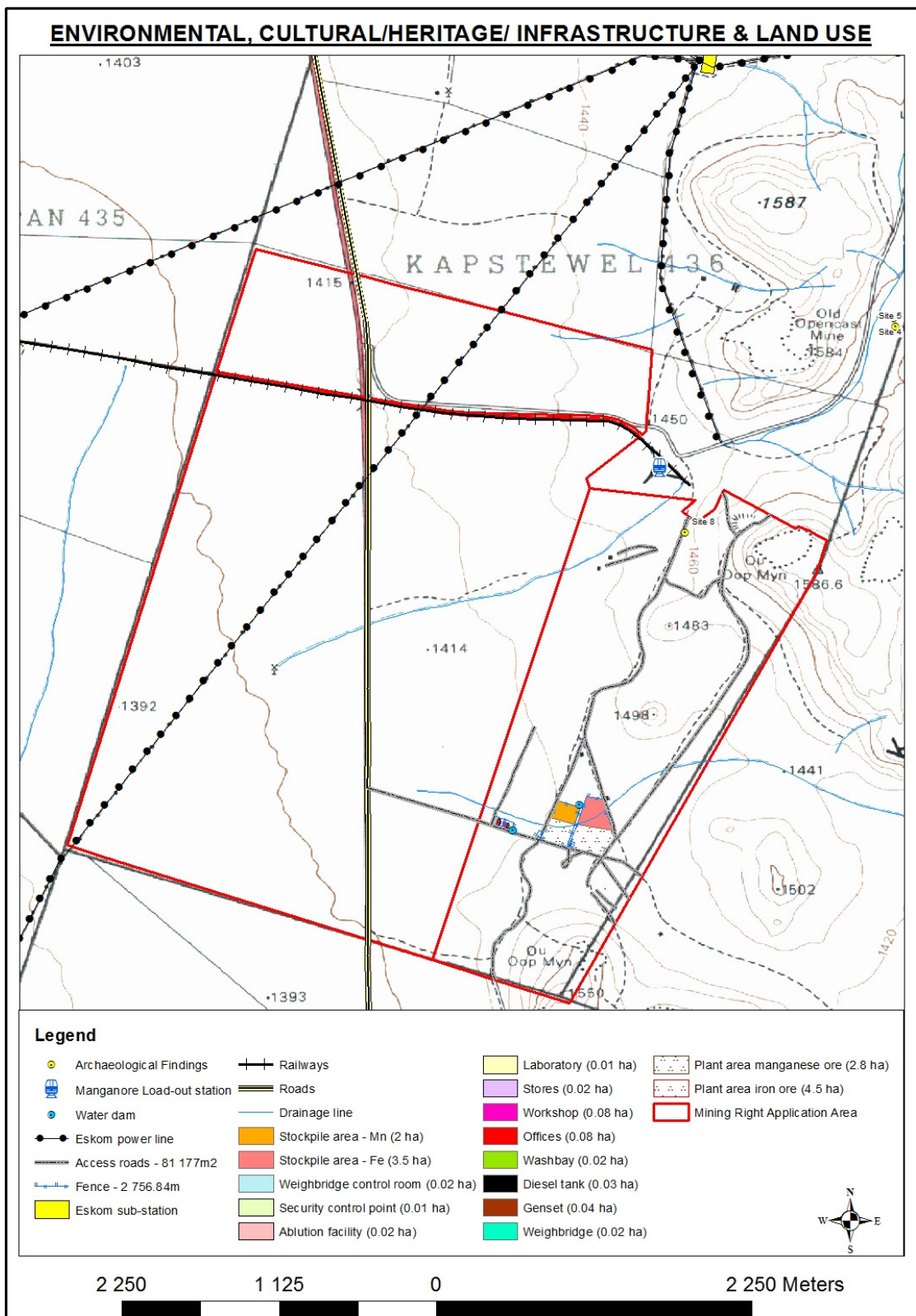


Figure 26 - Environmental, cultural/heritage, infrastructure and land use features

1.4. Confirmation that supporting documents in the form of specialist studies are attached as appendices.

**Attached hereto as Annexure 'A' to 'J' find the abovementioned specialists reports.**

## 2. The proposed mining operation

### 2.1. The mineral to be mined

Code	Commodity	Type code
Fe	Iron Ore	B
Mn	Manganese Ore	B

2.2. The mining method to be employed at the level of opencast, underground, stoping, stooping, total extraction, bord and pillar, block caving, shrinking, dredging, pumping, monitoring, etc. and provide a concise description of the intended magnitude thereof, in terms of volumes, depth and aerial extent.

- **Mining Method:**

- **Detrital – Iron ore and Manganese Ore – Years 1 and 2 of the mining operation:**

Autumn Skies will mine the detrital ore immediately after granting and execution of the mining right and continue to do so until the detrital resource has been depleted. Where present vegetated soil overlying the planned mining area is stripped prior to mining and stockpiled on a dedicated dump to be used for rehabilitation purposes at a later stage. Mining of the detrital ore will be done by the conventional opencast mining method whereby the detrital ore will be excavated with excavators, sand removed, the ore loaded onto articulated dump trucks from the open excavations and hauled to the crushing and screening plant. No overburden stripping or blasting is required.

- **Mountain - High Grade Iron ore and Manganese Ore – Year 3 to LOM of the mining operation:**

Mining of the high grade iron ore and manganese ore will commence in year 3 of the mining operation, the same year as Autumn Skies plans to reach full production of 30 000 tonnes iron ore per month and 10 000 tonnes manganese ore per month, until life-of-mine.

Where present vegetated soil overlying the planned mining area is stripped prior to mining and stockpiled on a dedicated dump to be used for rehabilitation purposes at a later stage. Mining will be done by the conventional opencast mining method. It is designed based on the nature of the ore-bodies on the mine, which proposes that each resource area be treated as a separate pit. Mining will be done on two ore bodies at any one time. Access to the opencast mining areas will be provided by a number of haul roads to the modular crushing, screening and JIG plant for the iron ore and the modular crushing and screening plant for the manganese ore.

The mining process will be initiated by drilling, then blasting and is then followed by loading and hauling of both ore and waste. One working shift of 10 – 12 hours will be arranged to achieve the targeted production.

○ **Drilling:**

The Mine will utilize 165mm class Drill Rigs for blasthole drilling. The standard hole diameter will be 165 mm. The hole depth will be 10.5m, allowing for a 10m bench height and 0.5m for sub drilling. A typical drilling pattern is a 4m x 5m grid spacing in waste and 2.5-3m x 3.0-3.5m in ore.

○ **Blasting:**

Emulsion and an oxidizer (ammonium nitrate porous prills (PPAN)) plus carbon (oil or diesel) are mixed to different proportions depending on the water resistance and energy required. The explosives are mixed and placed down the hole using trucks designed for this purpose. Approximately 130kg of explosives is placed in one blast hole and 104 tons of explosives are consumed per month. Autumn Skies will blast eight times per month.

○ **Loading:**

Autumn Skies will utilize the following equipment for loading of waste and ore respectively:

Description
Excavators
ADTs
Front End Loaders
TLBs

Waste material, iron ore and manganese ore is loaded separately on the Articulated Dump Trucks and hauled their respective destinations.

○ **Hauling:**

The iron ore will either be:-

- hauled to the modular crushing, screening and JIG plant where the ore will be dumped on the crushing floor for processing through the plant; or
- hauled to the subgrade stockpile area, which ore will be utilized in the future mine plan for blending purposes.

The manganese ore will either be:-

- hauled to the modular crushing and screening plant where the ore will be dumped on the crushing floor for processing through the plant; or
- hauled to the subgrade stockpile area, which ore will be utilized in the future mine plan for blending purposes.



The waste material will be hauled to the permanent waste rock dump or hauled to mined out areas for backfilling purposes.

- **Quality control:**
  - The chemical quality of the final products is partly controlled by supplying the plant with a suitable mixture of run-of-mine ore.
  - Samples are taken at regular intervals from the iron ore and manganese ore that has been crushed and screened and chemically analysed at the onsite laboratory to ensure that the final product contains the correct iron, silica, potassium oxide, phosphorus, sulphur and alumina content. A comprehensive record shall be kept of the samples analysed.
  - The iron ore that has been processed in the crushing and screening plant will be put through the jigging plant to ensure that the final product's grade adheres to the customer specifications.

- **Volume:**

IRON ORE		ROM TONNES	STRIPPING RATIO	FINAL PRODUCT	RESOURCE 16 000 000
Year 1	2014	0	0	360 000	15 640 000
Year 2	2015	0	0	360 000	15 280 000
Year 3	2016	1 260 000	1:2.5	360 000	14 920 000
Year 4	2017	1 260 000	1:2.5	360 000	14 560 000
Year 5	2018	1 260 000	1:2.5	360 000	14 200 000
Year 6	2019	1 260 000	1:2.5	360 000	13 840 000
Year 7	2020	1 260 000	1:2.5	360 000	13 480 000
Year 8	2021	1 260 000	1:2.5	360 000	13 120 000
Year 9	2022	1 260 000	1:2.5	360 000	12 760 000
Year 10	2023	1 260 000	1:2.5	360 000	12 400 000
Year 11	2024	1 260 000	1:2.5	360 000	12 040 000
Year 12	2025	1 260 000	1:2.5	360 000	11 680 000
Year 13	2026	1 260 000	1:2.5	360 000	11 320 000
Year 14	2027	1 260 000	1:2.5	360 000	10 960 000
Year 15	2028	1 260 000	1:2.5	360 000	10 600 000
Year 16	2029	1 260 000	1:2.5	360 000	10 240 000
Year 17	2030	1 260 000	1:2.5	360 000	9 880 000
Year 18	2031	1 260 000	1:2.5	360 000	9 520 000
Year 19	2032	1 260 000	1:2.5	360 000	9 160 000
Year 20	2033	1 260 000	1:2.5	360 000	8 800 000
Year 21	2034	1 260 000	1:2.5	360 000	8 440 000
Year 22	2035	1 260 000	1:2.5	360 000	8 080 000
Year 23	2036	1 260 000	1:2.5	360 000	7 720 000
Year 24	2037	1 260 000	1:2.5	360 000	7 360 000
Year 25	2038	1 260 000	1:2.5	360 000	7 000 000
Year 26	2039	1 260 000	1:2.5	360 000	6 640 000
Year 27	2040	1 260 000	1:2.5	360 000	6 280 000
Year 28	2041	1 260 000	1:2.5	360 000	5 920 000
Year 29	2042	1 260 000	1:2.5	360 000	5 560 000
Year 30	2043	1 260 000	1:2.5	360 000	5 200 000

MANGANESE ORE		ROM TONNES	STRIPPING RATIO	FINAL PRODUCT	RESOURCE 5 000 000
Year 1	2014	0	0	120 000	4 880 000
Year 2	2015	0	0	120 000	4 760 000
Year 3	2016	420 000	1:2.5	120 000	4 640 000
Year 4	2017	420 000	1:2.5	120 000	4 520 000
Year 5	2018	420 000	1:2.5	120 000	4 400 000
Year 6	2019	420 000	1:2.5	120 000	4 280 000
Year 7	2020	420 000	1:2.5	120 000	4 160 000
Year 8	2021	420 000	1:2.5	120 000	4 040 000
Year 9	2022	420 000	1:2.5	120 000	3 920 000
Year 10	2023	420 000	1:2.5	120 000	3 800 000
Year 11	2024	420 000	1:2.5	120 000	3 680 000
Year 12	2025	420 000	1:2.5	120 000	3 560 000
Year 13	2026	420 000	1:2.5	120 000	3 440 000
Year 14	2027	420 000	1:2.5	120 000	3 320 000
Year 15	2028	420 000	1:2.5	120 000	3 200 000
Year 16	2029	420 000	1:2.5	120 000	3 080 000
Year 17	2030	420 000	1:2.5	120 000	2 960 000
Year 18	2031	420 000	1:2.5	120 000	2 840 000
Year 19	2032	420 000	1:2.5	120 000	2 720 000
Year 20	2033	420 000	1:2.5	120 000	2 600 000
Year 21	2034	420 000	1:2.5	120 000	2 480 000
Year 22	2035	420 000	1:2.5	120 000	2 360 000
Year 23	2036	420 000	1:2.5	120 000	2 240 000
Year 24	2037	420 000	1:2.5	120 000	2 120 000
Year 25	2038	420 000	1:2.5	120 000	2 000 000
Year 26	2039	420 000	1:2.5	120 000	1 880 000
Year 27	2040	420 000	1:2.5	120 000	1 760 000
Year 28	2041	420 000	1:2.5	120 000	1 640 000
Year 29	2042	420 000	1:2.5	120 000	1 520 000
Year 30	2043	420 000	1:2.5	120 000	1 400 000

- **Depth:**  
The depth of the mineral below the surface varies between 0-145m (ore exposed at surface and extends up to 145m subsurface in saucer shaped structure).
- **Aerial extent:**  
The extent of the application area is 1 578.0055 hectares, although only areas underlain by proven iron ore and manganese ore resources will be targeted. The extent of the area required for infrastructure, roads, servitudes etc. is approximately 50 hectares.

- 2.3. List of the main mining actions, activities, or processes, such as, but not limited to, access roads, shafts, pits, workshops and stores, processing plant, residue deposition sites, topsoil storage sites, stockpiles, waste dumps, access roads, dams, and any other basic mine design features.

The proposed mining actions / activities / processes will include the following:

<b>Activity</b>	<b>Description</b>
<b>Ablution facilities</b>	Autumn Skies shall establish ablution facilities, with a french drain, at their office area.
<b>Access control (Security)</b>	Autumn Skies shall establish a security access control point at the mining site.
<b>Access road</b>	The surrounding areas are served by the R325 between Postmasburg and Kathu. Access to the site is by a secondary gravel road (1.5km from the R325 to the entrance gate of the application area) turning right from the R325.
<b>Chemical toilets</b>	Autumn Skies shall provide chemical toilets on their mining site for use by employees.
<b>Diesel tank</b>	Autumn Skies plans to establish 3 x 23 000 liter diesel tanks on the mining site.
<b>Electricity</b>	Autumn Skies plans to make use of 2 x 640kVA Gensets in their mining operation.
<b>Excavations</b>	Autumn Skies' selective, opencast detrital and high grade ore mining activities will create open excavation areas.
<b>Haul roads</b>	Autumn Skies' mining operation shall create various haul roads. These roads will provide access between the open excavation areas and the processing plants.
<b>Laboratory</b>	Autumn Skies plans to establish an on-site laboratory.
<b>Offices</b>	Autumn Skies will establish a series of office buildings for use in their mining operation.
<b>Processing plant</b>	Autumn Skies plans to establish the following: <ul style="list-style-type: none"> <li>• Iron Ore – A modular crushing, screening &amp; JIG plant</li> <li>• Manganese Ore – A modular crushing and screening plant</li> </ul>
<b>Recycling dam</b>	Autumn Skies shall establish recycling dams when the iron ore JIG plant is established.
<b>Salvage yard</b>	Autumn Skies shall establish a dedicated, fenced salvage yard where material that can be re-used will be stored.
<b>Stockpile area</b>	Autumn Skies shall establish a dedicated stockpile area where final product, ready for the market, will be stockpiled.
<b>Storage facilities</b>	Autumn Skies shall establish a series of storage facilities.
<b>Topsoil storage site</b>	Autumn Skies shall establish dedicated topsoil storage areas where all topsoil will be stored.
<b>Wash bay</b>	Autumn Skies shall establish a wash bay on the mining site.
<b>Waste</b>	Autumn Skies shall appoint an authorized waste removal company to remove all domestic and industrial waste from its

	site.
<b>Waste rock dumps</b>	<p>As selective mining will take place at the mining operation, very little waste rock will be created. The waste rock that will be created shall be stored in dumps on the high side of the open excavations for future backfilling.</p> <p>Autumn Skies plans to establish a permanent waste rock dump on the site as progressive, continuous backfilling will not always be possible.</p>
<b>Water dam</b>	Autumn Skies plans to establish 2 x 2 500m <sup>3</sup> water dams on the site for storing of water which will be utilized in their mining operation.
<b>Weighbridge</b>	Autumn Skies shall establish two weighbridges on the mining site.
<b>Weighbridge control room</b>	Autumn Skies shall establish a weighbridge control room for each weighbridge.
<b>Workshop</b>	Autumn Skies shall establish a workshop where all maintenance work and services of vehicles will take place.

2.4. Plan showing the location and aerial extent of the aforesaid main mining actions, activities, or processes as required to calculate the financial provision in accordance with the Department's published guideline. (Reg. 51 (b) (v)).

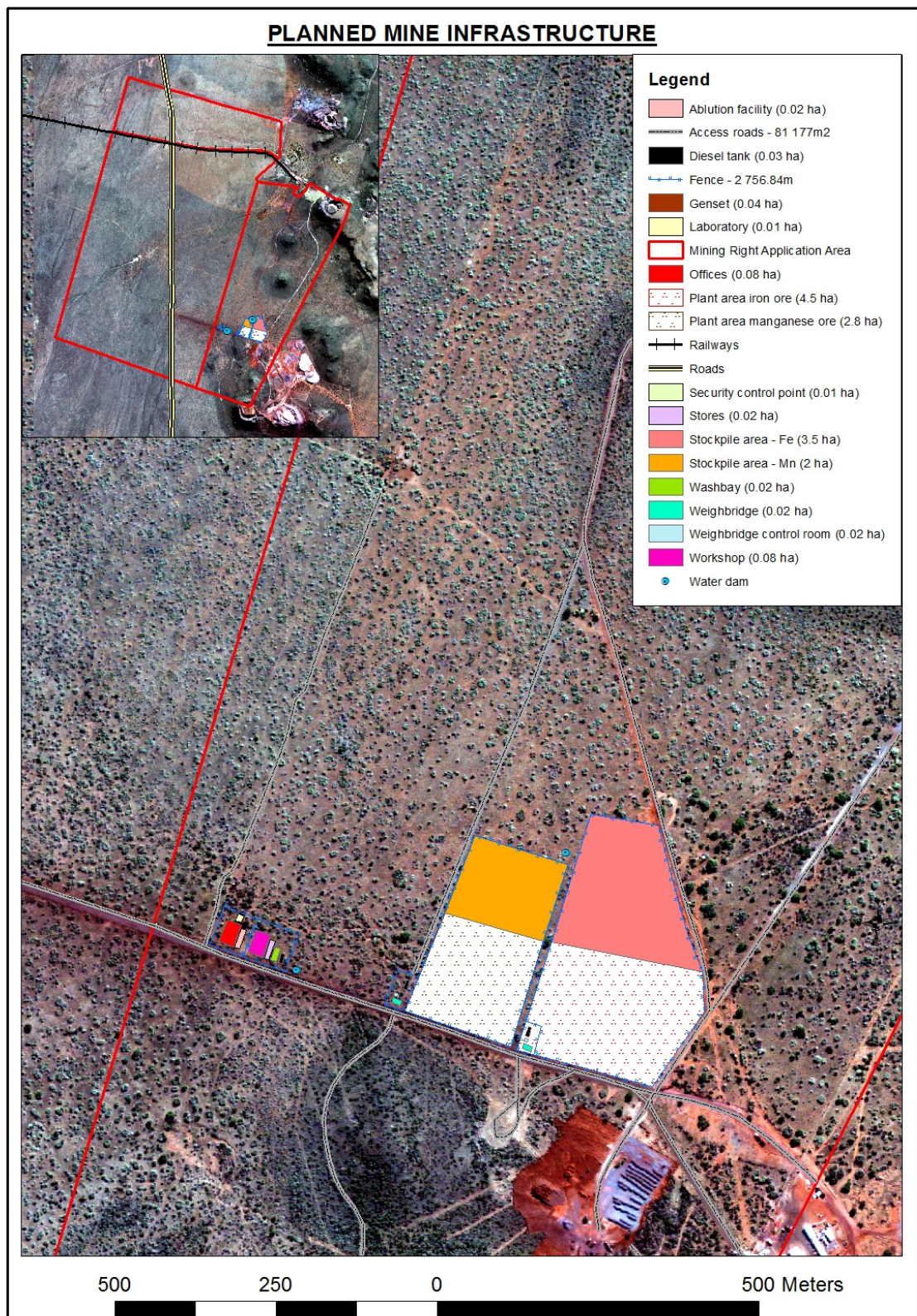


Figure 27 - Mine infrastructure

2.5. Listed activities (in terms of the NEMA EIA regulations) which will be occurring within the proposed project.

**According to Listing Notice 1: List of activities and competent authorities identified in terms of Sections 24(2) and 24D of the National Environmental Management Act, 1998 (Act no. 107 of 1998) of Government Gazette no 33306, No. R. 544 the following activities are applicable according to NEMA EIA regulations:**

<b>Activity 22</b>	<b>The construction of a road, outside urban areas, (i) with a reserve wider than 13.5 meters or, (ii) where no reserve exists where the road is wider than 8 meters, or (iii) for which an environmental authorisation was obtained for the route determination in terms of Activity 5 in Government Notice 387 of 2006 or activity 18 in Notice 545 of 2010.</b>
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**According to Listing Notice 2: List of activities and competent authorities identified in terms of Sections 24(2) and 24D of the National Environmental Management Act, 1998 (Act no. 107 of 1998) of Government Gazette no 33306, No. R. 545 the following activities are applicable according to NEMA EIA regulations:**

<b>Activity 15</b>	<b>Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more; except where such physical alteration takes place for: (i) linear development activities; or (ii) agriculture or afforestation where activity 16 in this Schedule will apply</b>
<b>Activity 20</b>	<b>Any activity which requires a mining right or renewal thereof as contemplated in Sections 22 and 24 respectively of the Mineral and Petroleum Resources Development Act, 2002 (Act no 28 of 2002).</b>

2.6. Indication of the phases (construction, operational, decommissioning) and estimated time frames in relation to the implementation of these actions, activities or processes and infrastructure.

- **Explanation of time taken to develop the mine and commence production:**

**Autumn Skies will use the first six months after granting and execution of their Mining Right for the construction phase of their mining operation.**

**Autumn Skies will mine the detrital ore immediately after granting and execution of the mining right and continue to do so until the detrital ore**

resource has been depleted. The detrital ore will be put through the processing plant once it has been established and first production is expected to be in month seven of the mining operation.

Mining of the high grade iron ore and manganese ore will commence in year 3 of the mining operation, the same year as Autumn Skies plans to reach full production of 30 000 tonnes iron ore per month and 10 000 manganese ore per month, until life-of-mine.

- Explanation of the production build up period once production commences:

Years 1 - 2	<p>Autumn Skies will use the first six months after granting and execution of their Mining Right for the construction phase of their mining operation. The infrastructure for the mining operation will be established and equipment will be acquired.</p> <p>Autumn Skies will mine the detrital ore immediately after granting and execution of the mining right and continue to do so until the detrital ore resource has been depleted. The detrital ore will be put through the processing plant once it has been established and first production is expected to be in month seven of the mining operation.</p>
Year 3 to LOM	<p>Mining of the high grade iron ore and manganese ore will commence in year 3 of the mining operation, the same year as Autumn Skies plans to reach full production of 30 000 tonnes iron ore per month and 10 000 manganese ore per month, until life-of-mine.</p>

- Explanation of production decline period (as grades deteriorate):

No decline in the production rates is foreseen in terms of volumes and grade. Selective mining, jigging and blending will ensure consistent grade.

- Production forecast for each year over the full period applied for based on the above explanations (Not Life-of-Mine calculation):

IRON ORE		ROM TONNES	STRIPPING RATIO	FINAL PRODUCT
Year 1	2014	0	0	360 000
Year 2	2015	0	0	360 000
Year 3	2016	1 260 000	1:2.5	360 000
Year 4	2017	1 260 000	1:2.5	360 000
Year 5	2018	1 260 000	1:2.5	360 000
Year 6	2019	1 260 000	1:2.5	360 000
Year 7	2020	1 260 000	1:2.5	360 000
Year 8	2021	1 260 000	1:2.5	360 000
Year 9	2022	1 260 000	1:2.5	360 000
Year 10	2023	1 260 000	1:2.5	360 000
Year 11	2024	1 260 000	1:2.5	360 000
Year 12	2025	1 260 000	1:2.5	360 000
Year 13	2026	1 260 000	1:2.5	360 000
Year 14	2027	1 260 000	1:2.5	360 000
Year 15	2028	1 260 000	1:2.5	360 000
Year 16	2029	1 260 000	1:2.5	360 000
Year 17	2030	1 260 000	1:2.5	360 000
Year 18	2031	1 260 000	1:2.5	360 000
Year 19	2032	1 260 000	1:2.5	360 000
Year 20	2033	1 260 000	1:2.5	360 000
Year 21	2034	1 260 000	1:2.5	360 000
Year 22	2035	1 260 000	1:2.5	360 000
Year 23	2036	1 260 000	1:2.5	360 000
Year 24	2037	1 260 000	1:2.5	360 000
Year 25	2038	1 260 000	1:2.5	360 000
Year 26	2039	1 260 000	1:2.5	360 000
Year 27	2040	1 260 000	1:2.5	360 000
Year 28	2041	1 260 000	1:2.5	360 000
Year 29	2042	1 260 000	1:2.5	360 000
Year 30	2043	1 260 000	1:2.5	360 000



<b>MANGANESE ORE</b>		<b>ROM TONNES</b>	<b>STRIPPING RATIO</b>	<b>FINAL PRODUCT</b>
<b>Year 1</b>	<b>2014</b>	0	0	120 000
<b>Year 2</b>	<b>2015</b>	0	0	120 000
<b>Year 3</b>	<b>2016</b>	420 000	1:2.5	120 000
<b>Year 4</b>	<b>2017</b>	420 000	1:2.5	120 000
<b>Year 5</b>	<b>2018</b>	420 000	1:2.5	120 000
<b>Year 6</b>	<b>2019</b>	420 000	1:2.5	120 000
<b>Year 7</b>	<b>2020</b>	420 000	1:2.5	120 000
<b>Year 8</b>	<b>2021</b>	420 000	1:2.5	120 000
<b>Year 9</b>	<b>2022</b>	420 000	1:2.5	120 000
<b>Year 10</b>	<b>2023</b>	420 000	1:2.5	120 000
<b>Year 11</b>	<b>2024</b>	420 000	1:2.5	120 000
<b>Year 12</b>	<b>2025</b>	420 000	1:2.5	120 000
<b>Year 13</b>	<b>2026</b>	420 000	1:2.5	120 000
<b>Year 14</b>	<b>2027</b>	420 000	1:2.5	120 000
<b>Year 15</b>	<b>2028</b>	420 000	1:2.5	120 000
<b>Year 16</b>	<b>2029</b>	420 000	1:2.5	120 000
<b>Year 17</b>	<b>2030</b>	420 000	1:2.5	120 000
<b>Year 18</b>	<b>2031</b>	420 000	1:2.5	120 000
<b>Year 19</b>	<b>2032</b>	420 000	1:2.5	120 000
<b>Year 20</b>	<b>2033</b>	420 000	1:2.5	120 000
<b>Year 21</b>	<b>2034</b>	420 000	1:2.5	120 000
<b>Year 22</b>	<b>2035</b>	420 000	1:2.5	120 000
<b>Year 23</b>	<b>2036</b>	420 000	1:2.5	120 000
<b>Year 24</b>	<b>2037</b>	420 000	1:2.5	120 000
<b>Year 25</b>	<b>2038</b>	420 000	1:2.5	120 000
<b>Year 26</b>	<b>2039</b>	420 000	1:2.5	120 000
<b>Year 27</b>	<b>2040</b>	420 000	1:2.5	120 000
<b>Year 28</b>	<b>2041</b>	420 000	1:2.5	120 000
<b>Year 29</b>	<b>2042</b>	420 000	1:2.5	120 000
<b>Year 30</b>	<b>2043</b>	420 000	1:2.5	120 000

- **Technically justified estimate of the period required:**  
(Description of the rate of production, estimated payable reserve ratio, efficiency factors and extraction rates, relative to available resources to justify the period applied for).

**Period – Autumn Skies applies for the maximum mining right period of thirty years. The iron ore and manganese resource as indicated in the Geological Report versus the mining rate as described in the two tables above substantiate the period required.**

**It has been shown that there are 16 million tonnes of iron ore within the application area. At an annual mining rate of 360 000 (final product), the mining life for iron ore is expected to be 44 years.**

**It has been shown that there are 5 million tonnes of manganese ore within the application area. At an annual mining rate of 120 000 (final product), the mining life for manganese ore is expected to be over 41 years.**

**The resource calculated is large enough to sustain a mining operation in excess for the maximum 30 year period applied for.**

2.7. Confirmation if any other relevant information is attached as appendices.

**There is no other relevant information attached that is not included above.**

### 3. The potential impacts

3.1. List of the potential impacts, on environmental aspects separately in respect of each of the aforesaid main mining actions, activities, processes, and activities listed in the NEMA EIA regulations (include all the items to be included in the list referred to in the concomitant section of the guideline posted on the official website of the Department).

**According to Listing Notice 1: List of activities and competent authorities identified in terms of Sections 24(2) and 24D of the National Environmental Management Act, 1998 (Act no. 107 of 1998) of Government Gazette no 33306, No. R. 544 the following activities are applicable according to NEMA EIA regulations:**

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**According to Listing Notice 2: List of activities and competent authorities identified in terms of Sections 24(2) and 24D of the National Environmental Management Act, 1998 (Act no. 107 of 1998) of Government Gazette no 33306, No. R. 545 the following activities are applicable according to NEMA EIA regulations:**

<b>Activity 15</b>	<b>Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more; except where such physical alteration takes place for: (i) linear development activities; or (ii) agriculture or afforestation where activity 16 in this Schedule will apply</b>
<b>Activity 20</b>	<b>Any activity which requires a mining right or renewal thereof as contemplated in Sections 22 and 24 respectively of the Mineral and Petroleum Resources Development Act, 2002 (Act no 28 of 2002).</b>

The following mining activities were identified according to the above listed NEMA activities:

Mining Activity	Potential impact on:	Type of impact	Description
Ablution facilities	Air quality	Negative Low	<ul style="list-style-type: none"> <li>Vehicle and equipment emissions in these areas during construction phase.</li> </ul>
	Fauna	Negative Medium	<ul style="list-style-type: none"> <li>The natural habitat of the animals will be disturbed and/or destroyed where these buildings will be built / established.</li> <li>Potential 'road' kills in these areas during construction.</li> </ul>
	Flora	Negative Medium	<ul style="list-style-type: none"> <li>The vegetation cover will be disturbed and / or destroyed in the areas where these buildings will be built / established.</li> </ul>
	Ground Water	Negative Low	<ul style="list-style-type: none"> <li>Possible hydrocarbon spills from mine vehicles and equipment in these areas during construction.</li> <li>Possible spillage of contents of french drain during operational phase.</li> </ul>
	Noise	Negative Low	<ul style="list-style-type: none"> <li>Minimal noise impact shall occur during the construction of these facilities.</li> </ul>
	Soil	Negative Low	<ul style="list-style-type: none"> <li>Disturbance of soil structure where these buildings will be built / established.</li> <li>Possible hydrocarbon spills from mine vehicles and equipment in these areas during construction.</li> </ul>
	Surface Water	Negative Low	<ul style="list-style-type: none"> <li>Potential pollution of surface water through hydrocarbon spills from vehicles and equipment in these areas during a rain event.</li> </ul>
	Topography	Not applicable	<ul style="list-style-type: none"> <li>No change in topography.</li> </ul>
	Visual	Negative Low	<ul style="list-style-type: none"> <li>Changing of natural view will take place. Breaking of natural skyline.</li> </ul>

Mining Activity	Potential impact on:	Type of impact	Description
Access control (security)	Air quality	Negative Low	<ul style="list-style-type: none"> <li>Vehicle and equipment emissions in these areas during construction phase.</li> </ul>
	Fauna	Negative Medium	<ul style="list-style-type: none"> <li>The natural habitat of the animals will be disturbed and/or destroyed where these buildings will be built / established.</li> <li>Potential 'road' kills in these areas.</li> </ul>
	Flora	Negative Medium	<ul style="list-style-type: none"> <li>The vegetation cover will be disturbed and / or destroyed in the areas where these buildings will be built / established.</li> </ul>
	Ground Water	Negative Low	<ul style="list-style-type: none"> <li>Possible hydrocarbon spills from mine vehicles and equipment in these areas.</li> </ul>
	Noise	Negative Low	<ul style="list-style-type: none"> <li>Minimal noise impact shall occur during the construction of these facilities.</li> </ul>
	Soil	Negative Low	<ul style="list-style-type: none"> <li>Disturbance of soil structure where these buildings will be built / established.</li> <li>Possible hydrocarbon spills from mine vehicles and equipment in these areas.</li> </ul>
	Surface Water	Negative Low	<ul style="list-style-type: none"> <li>Potential pollution of surface water through hydrocarbon spills from vehicles and equipment in these areas during a rain event.</li> </ul>
	Topography	Not applicable	<ul style="list-style-type: none"> <li>No change in topography.</li> </ul>
	Visual	Negative Low	<ul style="list-style-type: none"> <li>Changing of natural view will take place. Breaking of natural skyline.</li> </ul>

Mining Activity	Potential impact on:	Type of impact	Description
Access Roads	Air quality	Negative Low	<ul style="list-style-type: none"> <li>Nuisance dust will be created by vehicles and equipment utilizing this road to gain access to the mining site.</li> </ul>
	Fauna	Negative Low	<ul style="list-style-type: none"> <li>Potential road kills</li> </ul>
	Flora	Not applicable	<ul style="list-style-type: none"> <li>The access road to the proposed mining site is an existing secondary gravel road. No impact on flora is expected.</li> </ul>
	Ground Water	Negative Low	<ul style="list-style-type: none"> <li>Possible hydrocarbon spills from vehicles and equipment utilizing this road to gain access to the mining site.</li> </ul>
	Noise	Negative Low	<ul style="list-style-type: none"> <li>Noise from the vehicles and equipment utilizing this road to gain access to the mining site.</li> </ul>
	Soil	Negative Low	<ul style="list-style-type: none"> <li>The soil on the secondary gravel road to be utilized for access to the site has already been compacted.</li> <li>Possible hydrocarbon spills from vehicles and equipment utilizing this road to gain access to the mining site.</li> </ul>
	Surface Water	Negative Low	<ul style="list-style-type: none"> <li>If roads are not properly maintained, water erosion after thunder storms can occur.</li> <li>Possible hydrocarbon spills from vehicle and equipment utilizing this road to gain access to the mining site.</li> </ul>
	Topography	Not applicable	<ul style="list-style-type: none"> <li>No impact to the topography is expected from the access road.</li> </ul>
	Visual	Negative Low	<ul style="list-style-type: none"> <li>The access road is visible to some extent from the immediate surroundings.</li> </ul>

Mining Activity	Potential impact on:	Type of impact	Description
Chemical Toilets	Air quality	Not applicable	• No impact on air quality is expected
	Fauna	Not applicable	• No impact on the fauna is expected
	Flora	Not applicable	• No impact on the flora is expected
	Ground Water	Negative Low	• Possible spillage of contents of the chemical toilets.
	Noise	Not applicable	• No noise impact is expected
	Soil	Not applicable	• No impact on the soil is expected
	Surface Water	Not applicable	• No impact on surface water is expected
	Topography	Not applicable	• No change in topography will take place
	Visual	Not applicable	• No visual impact is expected.
Mining Activity	Potential impact on:	Type of impact	Description
Diesel tank	Air quality	Negative Low	• Potential vehicle and equipment emissions in these areas.
	Fauna	Negative Medium	• The natural habitat of the animals will be disturbed and/or destroyed where the diesel tanks will be established.
	Flora	Negative Medium	• The vegetation cover will be disturbed and / or destroyed where the diesel tanks will be established.
	Ground Water	Negative Low	• Potential pollution of groundwater through hydrocarbon spills.
	Noise	Negative Low	• A low noise impact is expected in these areas during refueling of vehicles.
	Soil	Negative Medium	• Disturbance of soil structure where the diesel tanks will be established. • Possible hydrocarbon spills from mine vehicles and equipment in these areas.
	Surface Water	Negative Low	• Potential pollution of surface water through hydrocarbon spills during a rain event.
	Topography	Not applicable	• No impact to topography is expected.
	Visual	Negative Low	• Changing of natural view will take place where the diesel tanks will be established.
Mining Activity	Potential impact on:	Type of impact	Description
Electricity (Genset)	Air quality	Negative Low	• Potential vehicle, equipment and genset emissions in these areas.
	Fauna	Negative Medium	• The natural habitat of the animals will be disturbed and/or destroyed where the gensets will be established.
	Flora	Negative Medium	• The vegetation cover will be disturbed and / or destroyed where the gensets will be established.
	Ground Water	Negative Low	• Potential pollution of groundwater through hydrocarbon spills.
	Noise	Negative Medium	• A medium noise impact is expected in these areas.
	Soil	Negative Medium	• Disturbance of soil structure where the gensets will be established. • Possible hydrocarbon spills in these areas.
	Surface Water	Negative Low	• Potential pollution of surface water through hydrocarbon spills during a rain event.
	Topography	Not applicable	• No impact to topography is expected.
	Visual	Negative Low	• Changing of natural view will take place where the gensets will be established.
Mining Activity	Potential impact on:	Type of impact	Description
Excavations	Air quality	Negative Medium	• Nuisance dust will be created by the mining equipment during excavation activities. • Nuisance dust will be created by the drilling and blasting activities.
	Fauna	Negative Medium	• Where new excavations will be created the natural habitat of the animals will be disturbed and/or destroyed. • Potential 'road' kills.
	Flora	Negative Medium	• Where new excavations will be created the vegetation will be disturbed and/or destroyed.
	Ground Water	Negative Low	• Possible hydrocarbon spills from mine vehicles and equipment in open excavations.
	Noise	Negative Medium	• Noise from the mining equipment and vehicles during excavations activities. • Noise from drilling and blasting activities.
	Soil	Negative Low	• Removal and disturbance of soil structure by excavation activities. • Possible hydrocarbon spills from mine vehicles and equipment in and around open excavations.
	Surface Water	Negative Low	• Collection of water in open excavations during and after thunderstorms. • Possible hydrocarbon spills from mine vehicles and equipment in open excavations.
	Topography	Negative High	• Changing of natural slopes will take place. The hill areas will be completely mine out, altering the topography permanently.
	Visual	Negative Low	• Changing of natural aesthetic view of environment will take place.

Mining Activity	Potential impact on:	Type of impact	Description
Haul Roads	Air quality	Negative Low	<ul style="list-style-type: none"> <li>Nuisance dust will be created by the mining equipment hauling material between the open excavation areas, the plant area, stockpile areas and waste dump areas.</li> </ul>
	Fauna	Negative Medium	<ul style="list-style-type: none"> <li>Where new haulage roads will be created the natural habitat of the animals will be disturbed and/or destroyed.</li> <li>Road kills.</li> <li>Where the firebreak will be created the natural habitat of the animals will be disturbed and/or destroyed.</li> </ul>
	Flora	Negative Medium	<ul style="list-style-type: none"> <li>Where new haulage roads will be created the vegetation will be disturbed and/or destroyed.</li> <li>Where the firebreak will be created the vegetation will be disturbed and/or destroyed.</li> </ul>
	Ground Water	Negative Low	<ul style="list-style-type: none"> <li>Possible hydrocarbon spills from mine vehicles.</li> </ul>
	Noise	Negative Low	<ul style="list-style-type: none"> <li>Noise from the mining vehicles and equipment on the haulage roads.</li> </ul>
	Soil	Negative Low	<ul style="list-style-type: none"> <li>Compaction of soil is expected on the roads that are used by the mining operation.</li> <li>Possible hydrocarbon spills from mine vehicles.</li> </ul>
	Surface Water	Negative Low	<ul style="list-style-type: none"> <li>If roads are not properly maintained, water erosion after thunder storms can occur.</li> <li>Possible hydrocarbon spills from mine vehicle.</li> </ul>
	Topography	Not applicable	<ul style="list-style-type: none"> <li>No impact to the topography is expected from the roads that will be created and used by the mining operation.</li> </ul>
	Visual	Negative Low	<ul style="list-style-type: none"> <li>The haulage roads will be visible to some extent from the immediate surroundings.</li> </ul>

Mining Activity	Potential impact on:	Type of impact	Description
Laboratory	Air quality	Negative Low	<ul style="list-style-type: none"> <li>Vehicle and equipment emissions in these areas during construction phase.</li> </ul>
	Fauna	Negative Medium	<ul style="list-style-type: none"> <li>The natural habitat of the animals will be disturbed and/or destroyed where these buildings will be built / established.</li> <li>Potential 'road' kills in these areas during construction.</li> </ul>
	Flora	Negative Medium	<ul style="list-style-type: none"> <li>The vegetation cover will be disturbed and / or destroyed in the areas where these buildings will be built / established.</li> </ul>
	Ground Water	Negative Low	<ul style="list-style-type: none"> <li>Possible hydrocarbon spills from mine vehicles and equipment in these areas during construction.</li> <li>Possible spillage of contents of laboratory products during operational phase.</li> </ul>
	Noise	Negative Low	<ul style="list-style-type: none"> <li>Minimal noise impact shall occur during the construction of these facilities.</li> </ul>
	Soil	Negative Low	<ul style="list-style-type: none"> <li>Disturbance of soil structure where these buildings will be built / established.</li> <li>Possible hydrocarbon spills from mine vehicles and equipment in these areas during construction.</li> </ul>
	Surface Water	Negative Low	<ul style="list-style-type: none"> <li>Potential pollution of surface water through hydrocarbon spills from vehicles and equipment in these areas during a rain event.</li> </ul>
	Topography	Not applicable	<ul style="list-style-type: none"> <li>No change in topography.</li> </ul>
	Visual	Negative Low	<ul style="list-style-type: none"> <li>Changing of natural view will take place. Breaking of natural skyline.</li> </ul>

Mining Activity	Potential impact on:	Type of impact	Description
Offices	Air quality	Negative Low	<ul style="list-style-type: none"> <li>Vehicle and equipment emissions in these areas.</li> </ul>
	Fauna	Negative Medium	<ul style="list-style-type: none"> <li>The natural habitat of the animals will be disturbed and/or destroyed where these buildings will be built / established.</li> <li>Potential 'road' kills in these areas.</li> </ul>
	Flora	Negative Medium	<ul style="list-style-type: none"> <li>The vegetation cover will be disturbed and / or destroyed in the areas where these buildings will be built / established.</li> </ul>
	Ground Water	Negative Low	<ul style="list-style-type: none"> <li>Possible hydrocarbon spills from mine vehicles and equipment in these areas.</li> <li>Usage of groundwater for potable water.</li> </ul>
	Noise	Negative Low	<ul style="list-style-type: none"> <li>Minimal noise impact shall occur during the construction of these facilities.</li> </ul>
	Soil	Negative Low	<ul style="list-style-type: none"> <li>Disturbance of soil structure where these buildings will be built / established.</li> <li>Possible hydrocarbon spills from mine vehicles and equipment in these areas.</li> </ul>
	Surface Water	Negative Low	<ul style="list-style-type: none"> <li>Potential pollution of surface water through hydrocarbon spills from vehicles and equipment in these areas during a rain event.</li> </ul>
	Topography	Not applicable	<ul style="list-style-type: none"> <li>No change in topography.</li> </ul>
	Visual	Negative Low	<ul style="list-style-type: none"> <li>Changing of natural view will take place. Breaking of natural skyline.</li> </ul>

Mining Activity	Potential impact on:	Type of impact	Description
Processing plants	Air quality	Negative Medium	<ul style="list-style-type: none"> <li>Nuisance dust will be created at the modular processing plants.</li> </ul>
	Fauna	Negative Medium	<ul style="list-style-type: none"> <li>The natural habitat of the animals will be disturbed and/or destroyed where the processing plant will be established.</li> </ul>
	Flora	Negative Medium	<ul style="list-style-type: none"> <li>The vegetation cover will be disturbed and / or destroyed where the modular processing plant will be established.</li> </ul>
	Ground Water	Negative Low	<ul style="list-style-type: none"> <li>Abstraction of groundwater for the use in the processing and beneficiation (jigging) of ore.</li> <li>Potential pollution of groundwater through hydrocarbon spills.</li> </ul>
	Noise	Negative High	<ul style="list-style-type: none"> <li>A high noise impact is expected in the immediate vicinity of the modular processing plants.</li> </ul>
	Soil	Negative Low	<ul style="list-style-type: none"> <li>Disturbance of soil structure where the modular processing plants will be established.</li> <li>Possible hydrocarbon spills from mine vehicles and equipment in these areas.</li> </ul>
	Surface Water	Negative Low Low	<ul style="list-style-type: none"> <li>Water from the Vaal Gamagara Pipeline will potentially be used for the processing and beneficiation of ore.</li> <li>Potential pollution of surface water through hydrocarbon spills during a rain event.</li> </ul>
	Topography	Not applicable	<ul style="list-style-type: none"> <li>No change in topography is expected.</li> </ul>
	Visual	Negative	<ul style="list-style-type: none"> <li>Changing of natural view will take place where the modular processing plants will be established.</li> <li>Breaking of natural skyline.</li> </ul>

Mining Activity	Potential impact on:	Type of impact	Description
Recycling dam	Air quality	Negative Low	<ul style="list-style-type: none"> <li>Nuisance dust will be created when the recycling dam is built.</li> <li>Nuisance dust will be experienced when the dam dries out and during rehabilitation thereof.</li> </ul>
	Fauna	Negative Medium	<ul style="list-style-type: none"> <li>The natural habitat of the animals will be disturbed and/or destroyed where the recycling dam will be established.</li> </ul>
	Flora	Negative Medium	<ul style="list-style-type: none"> <li>The vegetation cover will be disturbed and / or destroyed where the recycling dam will be established.</li> </ul>
	Ground Water	Positive Low	<ul style="list-style-type: none"> <li>Water collected in the recycling dam will infiltrate into the groundwater table and will have a potential positive effect on groundwater levels.</li> </ul>
	Noise	Not applicable	<ul style="list-style-type: none"> <li>No noise impact is expected.</li> </ul>
	Soil	Negative Medium	<ul style="list-style-type: none"> <li>Disturbance of soil structure where the recycling dam will be established.</li> </ul>
	Surface Water	Not applicable	<ul style="list-style-type: none"> <li>No impact to surface water is expected.</li> </ul>
	Topography	Not applicable	<ul style="list-style-type: none"> <li>No impact to topography is expected.</li> </ul>
Visual	Negative Low	<ul style="list-style-type: none"> <li>Changing of natural view will take place.</li> </ul>	

Mining Activity	Potential impact on:	Type of impact	Description
Salvage yard	Air quality	Negative Low	<ul style="list-style-type: none"> <li>Vehicle and equipment emissions in these areas.</li> </ul>
	Fauna	Negative Medium	<ul style="list-style-type: none"> <li>The natural habitat of the animals will be disturbed and/or destroyed where this area will be established.</li> <li>Potential 'road' kills in these areas.</li> </ul>
	Flora	Negative Medium	<ul style="list-style-type: none"> <li>The vegetation cover will be disturbed and / or destroyed in the areas where the salvage yard will be established.</li> </ul>
	Ground Water	Negative Low	<ul style="list-style-type: none"> <li>Possible hydrocarbon spills from mine vehicles and equipment in these areas.</li> </ul>
	Noise	Negative Low	<ul style="list-style-type: none"> <li>Minimal noise impact from mine vehicles and equipment in these areas.</li> </ul>
	Soil	Negative Low	<ul style="list-style-type: none"> <li>Disturbance of soil structure where the salvage yard will be established.</li> <li>Possible hydrocarbon spills from mine vehicles and equipment in these areas.</li> </ul>
	Surface Water	Negative Low	<ul style="list-style-type: none"> <li>Potential pollution of surface water through hydrocarbon spills from vehicles and equipment in these areas during a rain event.</li> </ul>
	Topography	Not applicable	<ul style="list-style-type: none"> <li>No change in topography.</li> </ul>
Visual	Not applicable	<ul style="list-style-type: none"> <li>No visual impact is expected.</li> </ul>	

Mining Activity	Potential impact on:	Type of impact	Description
Stockpile area	Air quality	Negative Low	<ul style="list-style-type: none"> <li>Nuisance dust is created in these areas when the material will dumped.</li> </ul>
	Fauna	Negative Medium	<ul style="list-style-type: none"> <li>The natural habitat of the animals will be disturbed and/or destroyed where these sites will be established.</li> </ul>
	Flora	Negative Medium	<ul style="list-style-type: none"> <li>The vegetation cover will be disturbed and / or destroyed where these sites will be established.</li> </ul>
	Ground Water	Negative Low	<ul style="list-style-type: none"> <li>Potential pollution of groundwater through hydrocarbon spills.</li> </ul>
	Noise	Negative Low	<ul style="list-style-type: none"> <li>A low noise impact is expected in these areas.</li> </ul>
	Soil	Negative Medium	<ul style="list-style-type: none"> <li>Disturbance of soil structure where these sites will be created.</li> <li>Possible hydrocarbon spills from mine vehicles and equipment in these areas.</li> </ul>
	Surface Water	Negative Low	<ul style="list-style-type: none"> <li>Potential pollution of surface water through hydrocarbon spills during a rain event.</li> </ul>
	Topography	Not applicable	<ul style="list-style-type: none"> <li>No impact to the topography is expected.</li> </ul>
	Visual	Negative Low	<ul style="list-style-type: none"> <li>Changing of natural view will take place where these sites will be established.</li> <li>Breaking of natural skyline.</li> </ul>

Mining Activity	Potential impact on:	Type of impact	Description
Storage facilities	Air quality	Negative Low	<ul style="list-style-type: none"> <li>Vehicle and equipment emissions in these areas.</li> </ul>
	Fauna	Negative Medium	<ul style="list-style-type: none"> <li>The natural habitat of the animals will be disturbed and/or destroyed where these buildings will be built / established.</li> <li>Potential 'road' kills in these areas.</li> </ul>
	Flora	Negative Medium	<ul style="list-style-type: none"> <li>The vegetation cover will be disturbed and / or destroyed in the areas where these buildings will be built / established.</li> </ul>
	Ground Water	Negative Low	<ul style="list-style-type: none"> <li>Possible hydrocarbon spills from mine vehicles and equipment in these areas.</li> </ul>
	Noise	Negative Low	<ul style="list-style-type: none"> <li>Minimal noise impact.</li> </ul>
	Soil	Negative Low	<ul style="list-style-type: none"> <li>Disturbance of soil structure where these buildings will be built / established.</li> <li>Possible hydrocarbon spills from mine vehicles and equipment in these areas.</li> </ul>
	Surface Water	Negative Low	<ul style="list-style-type: none"> <li>Potential pollution of surface water through hydrocarbon spills from vehicles and equipment in these areas during a rain event.</li> </ul>
	Topography	Not applicable	<ul style="list-style-type: none"> <li>No change in topography.</li> </ul>
	Visual	Negative Low	<ul style="list-style-type: none"> <li>Changing of natural view will take place. Breaking of natural skyline.</li> </ul>

Mining Activity	Potential impact on:	Type of impact	Description
Topsoil storage site	Air quality	Negative Low	<ul style="list-style-type: none"> <li>Nuisance dust will be created in these areas when the material will be dumped.</li> </ul>
	Fauna	Negative Medium	<ul style="list-style-type: none"> <li>The natural habitat of the animals will be disturbed and/or destroyed where these sites will be established.</li> </ul>
	Flora	Negative Medium	<ul style="list-style-type: none"> <li>The vegetation cover will be disturbed and / or destroyed where these sites will be established.</li> </ul>
	Ground Water	Negative Low	<ul style="list-style-type: none"> <li>Potential pollution of groundwater through hydrocarbon spills.</li> </ul>
	Noise	Negative Low	<ul style="list-style-type: none"> <li>A low noise impact is expected in these areas.</li> </ul>
	Soil	Negative Medium	<ul style="list-style-type: none"> <li>Disturbance of soil structure where these sites will be created.</li> <li>Possible hydrocarbon spills from mine vehicles and equipment in these areas.</li> </ul>
	Surface Water	Negative Low	<ul style="list-style-type: none"> <li>Potential pollution of surface water through hydrocarbon spills during a rain event.</li> </ul>
	Topography	Not applicable	<ul style="list-style-type: none"> <li>No impact to the topography is expected.</li> </ul>
	Visual	Negative Low	<ul style="list-style-type: none"> <li>Changing of natural view will take place where these sites will be established.</li> <li>Breaking of natural skyline.</li> </ul>



Mining Activity	Potential impact on:	Type of impact	Description
Wash bay	Air quality	Negative Low	<ul style="list-style-type: none"> <li>A minimal amount of nuisance dust from the vehicles and equipment in this area.</li> </ul>
	Fauna	Negative Medium	<ul style="list-style-type: none"> <li>The natural habitat of the animals will be disturbed and/or destroyed where the wash bay will be established.</li> </ul>
	Flora	Negative Medium	<ul style="list-style-type: none"> <li>The vegetation cover will be disturbed and / or destroyed where the wash bay will be established.</li> </ul>
	Ground Water	Negative Low	<ul style="list-style-type: none"> <li>The utilization of groundwater for the cleaning of vehicles and equipment.</li> <li>Potential pollution of groundwater through hydrocarbon spills.</li> </ul>
	Noise	Negative Low	<ul style="list-style-type: none"> <li>A minimal noise impact is expected at the wash bay.</li> </ul>
	Soil	Negative Low	<ul style="list-style-type: none"> <li>Disturbance of soil structure where the wash bay will be established.</li> <li>Possible hydrocarbon spills from mine vehicles and equipment in this area.</li> </ul>
	Surface Water	Negative Low	<ul style="list-style-type: none"> <li>Water from the Vaal Gamagara Pipeline will potentially be used for the cleaning of vehicles and equipment at the wash bay.</li> <li>Potential pollution of surface water through hydrocarbon spills during a rain event.</li> </ul>
	Topography	Not applicable	<ul style="list-style-type: none"> <li>No change in topography is expected.</li> </ul>
	Visual	Negative Low	<ul style="list-style-type: none"> <li>Changing of natural view will take place where the wash bay will be established.</li> </ul>

Mining Activity	Potential impact on:	Type of impact	Description
Waste disposal (domestic & industrial)	Air quality	Negative Low	<ul style="list-style-type: none"> <li>Vehicle and equipment emissions in these areas.</li> </ul>
	Fauna	Negative Medium	<ul style="list-style-type: none"> <li>The natural habitat of the animals will be disturbed and/or destroyed where these areas will be established.</li> <li>Potential 'road' kills in these areas.</li> </ul>
	Flora	Negative Medium	<ul style="list-style-type: none"> <li>The vegetation cover will be disturbed and / or destroyed where these areas will be established.</li> </ul>
	Ground Water	Negative Low	<ul style="list-style-type: none"> <li>Possible hydrocarbon spills from mine vehicles and equipment in these areas.</li> </ul>
	Noise	Negative Low	<ul style="list-style-type: none"> <li>Minimal noise impact.</li> </ul>
	Soil	Negative Low	<ul style="list-style-type: none"> <li>Disturbance of soil structure where these areas will be established.</li> <li>Possible hydrocarbon spills from mine vehicles and equipment in these areas.</li> </ul>
	Surface Water	Negative Low	<ul style="list-style-type: none"> <li>Potential pollution of surface water through hydrocarbon spills from vehicles and equipment in these areas during a rain event.</li> </ul>
	Topography	Not applicable	<ul style="list-style-type: none"> <li>No change in topography.</li> </ul>
	Visual	Negative Low	<ul style="list-style-type: none"> <li>Changing of natural view will take place. Breaking of natural skyline.</li> </ul>

Mining Activity	Potential impact on:	Type of impact	Description
Waste rock dumps (residue disposal sites)	Air quality	Negative Low	<ul style="list-style-type: none"> <li>Nuisance dust is created in these areas when the material is dumped.</li> </ul>
	Fauna	Negative Medium	<ul style="list-style-type: none"> <li>The natural habitat of the animals will be disturbed and/or destroyed where these sites will be established.</li> </ul>
	Flora	Negative Medium	<ul style="list-style-type: none"> <li>The vegetation cover will be disturbed and / or destroyed where these sites will be established.</li> </ul>
	Ground Water	Negative Low	<ul style="list-style-type: none"> <li>Potential pollution of groundwater through hydrocarbon spills.</li> </ul>
	Noise	Negative Low	<ul style="list-style-type: none"> <li>A low noise impact is expected in these areas.</li> </ul>
	Soil	Negative Medium	<ul style="list-style-type: none"> <li>Disturbance of soil structure where these sites will be created.</li> <li>Possible hydrocarbon spills from mine vehicles and equipment in these areas.</li> </ul>
	Surface Water	Negative Low	<ul style="list-style-type: none"> <li>Potential pollution of surface water through hydrocarbon spills during a rain event.</li> </ul>
	Topography	Negative High	<ul style="list-style-type: none"> <li>A permanent waste rock dump will be created on site.</li> </ul>
	Visual	Negative Low	<ul style="list-style-type: none"> <li>Changing of natural view will take place where these sites will be established.</li> <li>Breaking of natural skyline.</li> </ul>

Mining Activity	Potential impact on:	Type of impact	Description	
Water dams	Air quality	Negative Low	•	Nuisance dust from vehicles collecting water in these areas is expected.
	Fauna	Negative Medium	•	The natural habitat of the animals will be disturbed and/or destroyed where the dams will be built.
	Flora	Negative Medium	•	The natural flora will be disturbed and/or destroyed where the dams will be built.
	Ground Water	Negative Low	•	Abstraction of groundwater.
	Noise	Not applicable	•	No noise impact is expected.
	Soil	Negative Low	•	Disturbance of soil structure where the dams will be built.
	Surface Water	Not applicable	•	No impact to surface water is expected.
	Topography	Not applicable	•	No impact to topography is expected.
Visual	Negative Low	•	Changing of natural view.	

Mining Activity	Potential impact on:	Type of impact	Description	
Weighbridge & weighbridge control room	Air quality	Negative Low	•	Potential vehicle and equipment emissions in these areas.
	Fauna	Negative Medium	•	The natural habitat of the animals will be disturbed and/or destroyed where the weighbridge and control room will be built / established.
	Flora	Negative Medium	•	The natural flora will be disturbed and/or destroyed where the weighbridge and control room will be built / established.
	Ground Water	Negative Low	•	Possible hydrocarbon spills from mine vehicles and equipment in these areas.
	Noise	Negative Low	•	Minimal noise impact.
	Soil	Negative Low	•	Possible hydrocarbon spills from mine vehicles and equipment in these areas.
	Surface Water	Negative Low	•	Potential pollution of surface water through hydrocarbon spills from vehicles and equipment in these areas during a rain event.
	Topography	Not applicable	•	No change in topography.
	Visual	Negative Low	•	Changing of natural view is expected to take place. • Breaking of natural skyline.

Mining Activity	Potential impact on:	Type of impact	Description	
Workshop	Air quality	Negative Low	•	Vehicle and equipment emissions in these areas.
	Fauna	Negative Medium	•	The natural habitat of the animals will be disturbed and/or destroyed where these buildings will be built / established. • Potential 'road' kills in these areas.
	Flora	Negative Medium	•	The vegetation cover will be disturbed and / or destroyed in the areas where these buildings will be built / established.
	Ground Water	Negative Low	•	Possible hydrocarbon spills from mine vehicles and equipment in these areas.
	Noise	Negative Low	•	Minimal noise impact.
	Soil	Negative Low	•	Disturbance of soil structure where these buildings will be built / established. • Possible hydrocarbon spills from mine vehicles and equipment in these areas.
	Surface Water	Negative Low	•	Potential pollution of surface water through hydrocarbon spills from vehicles and equipment in these areas during a rain event.
	Topography	Not applicable	•	No change in topography.
	Visual	Negative Low	•	Changing of natural view is expected to take place. Breaking of natural skyline.

3.2. List of all potential cumulative environmental impacts.

Potential impact on:	Description
Air quality	<b>Impacts on the mine site:</b>
	<ul style="list-style-type: none"> <li>Nuisance dust on roads will be created by the mining equipment hauling material between the open excavation areas, the plant area, stockpile areas and waste dump areas on the mine site.</li> </ul>
	<ul style="list-style-type: none"> <li>Nuisance dust will be created by the mining equipment during excavation activities.</li> </ul>
	<ul style="list-style-type: none"> <li>Nuisance dust will be created by the drilling and blasting activities.</li> </ul>
	<ul style="list-style-type: none"> <li>Vehicle and equipment emissions in workshop, stores and office areas.</li> </ul>
	<ul style="list-style-type: none"> <li>Nuisance dust will be created at the modular processing plant.</li> </ul>
	<ul style="list-style-type: none"> <li>Nuisance dust will be created in the residue deposition site, topsoil storage site, stockpile and waste dump areas when the material is dumped.</li> </ul>
	<ul style="list-style-type: none"> <li>Nuisance dust will be created when new infrastructure is established.</li> </ul>
	<b>Impacts from area surrounding the mine site:</b>
	<ul style="list-style-type: none"> <li>Nuisance dust from the roads transecting the property and surrounding area.</li> </ul>
	<ul style="list-style-type: none"> <li>Smoke from domestic open fires in the residing communities.</li> </ul>
	<ul style="list-style-type: none"> <li>Dust created by surrounding prospecting and mining activities.</li> </ul>
	<ul style="list-style-type: none"> <li>Emmissions from vehicles utilizing the road network in the area immediately surrounding the mine.</li> </ul>

Potential impact on:	Description
Fauna	<b>Impacts on the mine site:</b>
	<ul style="list-style-type: none"> <li>Where new haulage roads will be created the natural habitat of the animals will be disturbed and/or destroyed.</li> </ul>
	<ul style="list-style-type: none"> <li>Road kills.</li> </ul>
	<ul style="list-style-type: none"> <li>Where the firebreak will be created the natural habitat of the animals will be disturbed and/or destroyed.</li> </ul>
	<ul style="list-style-type: none"> <li>Where new excavations will be created the natural habitat of the animals will be disturbed and/or destroyed.</li> </ul>
	<ul style="list-style-type: none"> <li>The natural habitat of the animals will be disturbed and/or destroyed where buildings and infrastructure will be built / established.</li> </ul>
	<ul style="list-style-type: none"> <li>The natural habitat of the animals will be disturbed and/or destroyed where the modular processing plant will be established.</li> </ul>
	<ul style="list-style-type: none"> <li>The natural habitat of the animals will be disturbed and/or destroyed where the residue deposition site, topsoil storage site, stockpile and waste dump areas will be established.</li> </ul>
	<ul style="list-style-type: none"> <li>The natural habitat of the animals will be disturbed and/or destroyed where new infrastructure will be established.</li> </ul>
	<b>Impacts from area surrounding the mine site:</b>
	<ul style="list-style-type: none"> <li>Hunting &amp; Snaring of animals</li> </ul>
	<ul style="list-style-type: none"> <li>Hunting on surrounding farms</li> </ul>
	<ul style="list-style-type: none"> <li>Disturbance and / or destruction of the natural habitat of the animals from surrounding prospecting / mining operations.</li> </ul>

Potential impact on:	Description
Flora	<b>Impacts on the mine site:</b>
	<ul style="list-style-type: none"> <li>Where new haulage roads will be created the vegetation will be disturbed and/or destroyed.</li> </ul>
	<ul style="list-style-type: none"> <li>Where the firebreak will be created the vegetation will be disturbed and/or destroyed.</li> </ul>
	<ul style="list-style-type: none"> <li>Where new excavations will be created the vegetation will be disturbed and/or destroyed.</li> </ul>
	<ul style="list-style-type: none"> <li>The vegetation cover will be disturbed and / or destroyed in the areas where the buildings and infrastructure will be built / established.</li> </ul>
	<ul style="list-style-type: none"> <li>The vegetation cover will be disturbed and / or destroyed where the modular processing plant will be established.</li> </ul>
	<ul style="list-style-type: none"> <li>The vegetation cover will be disturbed and / or destroyed where the residue deposition site, topsoil storage site, stockpile and waste dump areas will be established.</li> </ul>
	<ul style="list-style-type: none"> <li>The vegetation cover will be disturbed and / or destroyed where new infrastructure will be established.</li> </ul>
	<b>Impacts from area surrounding the mine site:</b>
	<ul style="list-style-type: none"> <li>Grazing of livestock.</li> </ul>
	<ul style="list-style-type: none"> <li>Runaway veld fires.</li> </ul>
<ul style="list-style-type: none"> <li>Disturbance and / or destruction of the natural vegetation cover from surrounding prospecting / mining operations.</li> </ul>	

Potential impact on:	Description
Groundwater	<b>Impacts on the mine site:</b>
	<ul style="list-style-type: none"> <li>Possible hydrocarbon spills from mine vehicles.</li> </ul>
	<ul style="list-style-type: none"> <li>Abstraction of groundwater for the use in the processing and beneficiation (jigging) of ore.</li> </ul>
	<ul style="list-style-type: none"> <li>The utilization of groundwater for the cleaning of vehicles and equipment.</li> </ul>
	<b>Impacts from area surrounding the mine site:</b>
	<ul style="list-style-type: none"> <li>Surrounding surface owners extracts groundwater for domestic and livestock farming uses.</li> </ul>
<ul style="list-style-type: none"> <li>Abstraction of groundwater by surrounding prospecting / mining operations.</li> </ul>	

Potential impact on:	Description
Noise	<b>Impacts on the mine site:</b>
	<ul style="list-style-type: none"> <li>Noise from the mining equipment on the haulage roads.</li> </ul>
	<ul style="list-style-type: none"> <li>Noise from the mining equipment and vehicles during excavations activities.</li> </ul>
	<ul style="list-style-type: none"> <li>Noise from drilling and blasting activities.</li> </ul>
	<ul style="list-style-type: none"> <li>A high noise impact is expected in the immediate vicinity of the modular processing plant.</li> </ul>
	<b>Impacts from area surrounding the mine site:</b>
	<ul style="list-style-type: none"> <li>Noise created by traffic on surrounding road network.</li> </ul>
	<ul style="list-style-type: none"> <li>Noise created by surrounding agricultural equipment / activities.</li> </ul>
<ul style="list-style-type: none"> <li>Noise created by surrounding prospecting / mining activities.</li> </ul>	

Potential impact on:	Description
Soil	<b>Impacts on the mine site:</b>
	<ul style="list-style-type: none"> <li>• Compaction of soil is expected on the roads that are to be used by the mining operation.</li> </ul>
	<ul style="list-style-type: none"> <li>• Possible hydrocarbon spills from mine vehicles.</li> </ul>
	<ul style="list-style-type: none"> <li>• Removal and disturbance of soil structure by excavation activities.</li> </ul>
	<ul style="list-style-type: none"> <li>• Disturbance of soil structure where buildings and infrastructure will be built / established.</li> </ul>
	<ul style="list-style-type: none"> <li>• Disturbance of soil structure where the residue deposition sites, topsoil storage sites, stockpile and waste dump sites will be created.</li> </ul>
	<ul style="list-style-type: none"> <li>• Disturbance of soil structure where new infrastructure will be established.</li> </ul>
	<b>Impacts from area surrounding the mine site:</b>
	<ul style="list-style-type: none"> <li>• Disturbance of soil structure by surrounding prospecting / mining operations.</li> </ul>
<ul style="list-style-type: none"> <li>• Potential hydrocarboun spills from vehicles and equipment of surrounding prospecting / mining operations.</li> </ul>	

Potential impact on:	Description
Surface water	<b>Impacts on the mine site:</b>
	<ul style="list-style-type: none"> <li>• If roads are not properly maintained, water erosion after thunder storms can occur.</li> </ul>
	<ul style="list-style-type: none"> <li>• Possible contamination of surface water by hydrocarbon spills during a rain event.</li> </ul>
	<ul style="list-style-type: none"> <li>• Collection of water in open excavations during and after thunderstorms.</li> </ul>
	<ul style="list-style-type: none"> <li>• Water from the Vaal Gamagara Pipeline will potentially be used for the processing and beneficiation of ore.</li> </ul>
	<ul style="list-style-type: none"> <li>• Water from the Vaal Gamagara Pipeline will potentially be used for the cleaning of vehicles and equipment at the wash bay.</li> </ul>
	<b>Impacts from area surrounding the mine site:</b>
	<ul style="list-style-type: none"> <li>• Using of water from the Vaal gamagara Pipeline for processing, beneficiation and domestic purposes by the surrounding prospecting / mining operations.</li> </ul>
	<ul style="list-style-type: none"> <li>• Potential hydrocarboun spills from vehicles and equipment of surrounding prospecting / mining operations.</li> </ul>

Potential impact on:	Description
Topography	<b>Impacts on the mine site:</b>
	<ul style="list-style-type: none"> <li>• Changing of natural slopes will take place. The hill areas will be completely mined out, altering the topography permanently.</li> </ul>
	<ul style="list-style-type: none"> <li>• A permanent waste rock dump will be created on site, altering the topography.</li> </ul>
	<b>Impacts from area surrounding the mine site:</b>
<ul style="list-style-type: none"> <li>• Changing of natural slopes by surrounding prospecting / mining operations.</li> </ul>	

Potential impact on:	Description
Visual	<b>Impacts on the mine site:</b>
	<ul style="list-style-type: none"> <li>• The haulage roads will be visible to some extent from the immediate surroundings.</li> </ul>
	<ul style="list-style-type: none"> <li>• Changing of natural aesthetic view of environment could take place from mining activities and relating infrastructure.</li> </ul>
	<ul style="list-style-type: none"> <li>• Breaking of natural skyline.</li> </ul>
	<b>Impacts from area surrounding the mine site:</b>
<ul style="list-style-type: none"> <li>• Changing of natural aesthetic view of the environment could take place from surrounding prospecting and mining activities.</li> </ul>	

3.3. State specifically whether or not there is a risk of acid mine drainage or potential groundwater contamination associated with the mineral to be mined. (If such a risk is associated with the mineral to be mined, provide a summary of the findings and recommendations of a specialist geo-hydrological report in that regard.)

**No potential for bad quality leachate or acid mine drainage development exist during or after mine closure.**

## **REGULATION (50)(b)**

### **4. The alternative land use or developments that may be affected.**

4.1. Concise description of the alternative land use of the area in which the mine is proposed to operate.

<b>Alternative Land Use</b>	<b>Description</b>
Livestock farming	The properties under application for a mining right is currently utilized for livestock farming purposes.

4.2. List and description of all the main features and infrastructure related to the alternative land uses or developments.

**Main features and infrastructure relating to alternative land uses include the following:**

- **There is a single line Eskom power line traversing the property from the north to the west. An Eskom sub-station is found approximately 2km north of the mine boundary.**
- **The R325 between Postmasburg and Kathu traverses the application area from the south to the north.**
- **Access to the site and surrounding properties is by a secondary gravel road (1.5km from the R325 to the entrance gate of the application area) turning right from the R325. There are a number of gravel roads traversing the property, which were not created by the mining operation.**
- **There are a few farm roads on the property, which are utilized by the surface owners.**
- **There are a small number of windmills, for livestock watering, on the application area.**

4.3. Plan showing the location and aerial extent of the aforesaid main features of the alternative land use and infrastructure related to alternative land developments identified during scoping.

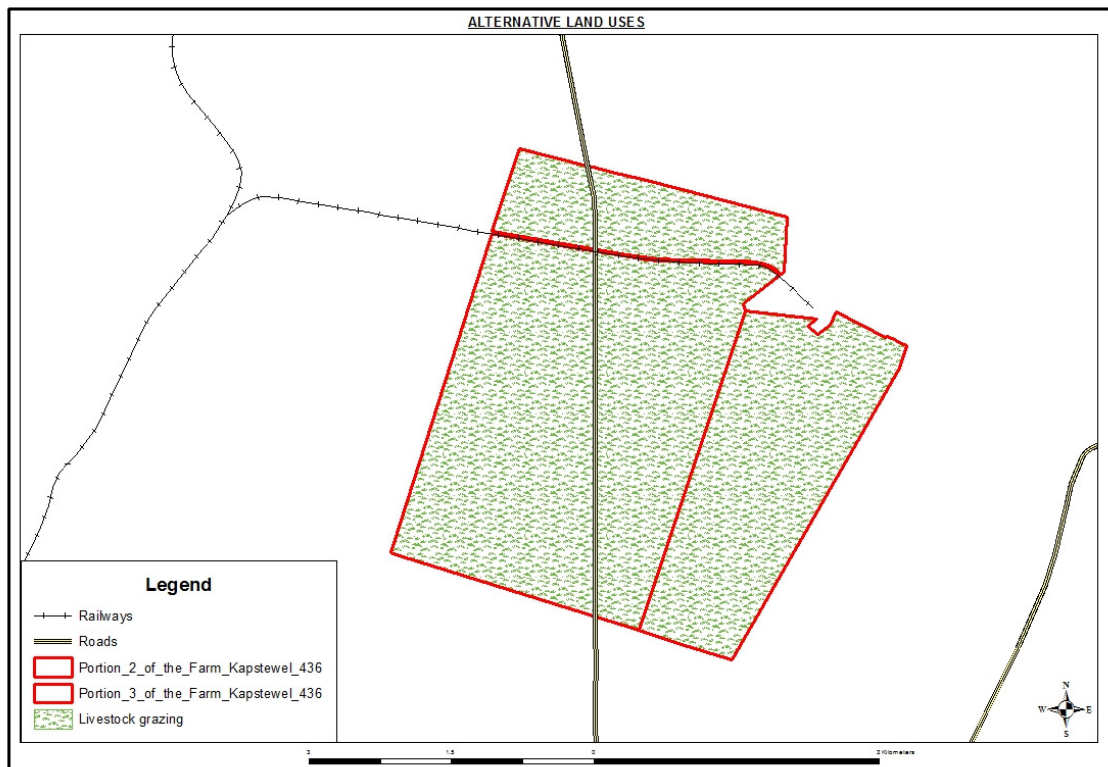


Figure 28 - Alternative land uses

## 5. The potential impacts of the alternative land use or development.

5.1. List of the potential impacts of each of the aforesaid main features and infrastructure related to the alternative land use or development and related listed activities.

**According to Listing Notice 1: List of activities and competent authorities identified in terms of Sections 24(2) and 24D of the National Environmental Management Act, 1998 (Act no. 107 of 1998) of Government Gazette no 33306, No. R. 544 the following activities are applicable according to NEMA EIA regulations:**

<p><b>Activity 22</b></p>	<p><b>The construction of a road, outside urban areas,</b>  <b>(i) with a reserve wider than 13.5 meters or,</b>  <b>(ii) where no reserve exists where the road is wider than 8 meters, or</b>  <b>(iii) for which an environmental authorisation was obtained for the route determination in terms of Activity 5 in Government Notice 387 of 2006 or activity 18 in Notice 545 of 2010.</b></p>
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According to Listing Notice 2: List of activities and competent authorities identified in terms of Sections 24(2) and 24D of the National Environmental Management Act, 1998 (Act no. 107 of 1998) of Government Gazette no 33306, No. R. 545 the following activities are applicable according to NEMA EIA regulations:

<b>Activity 15</b>	<b>Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more; except where such physical alteration takes place for:</b> <b>(i) linear development activities; or</b> <b>(ii) agriculture or afforestation where activity 16 in this Schedule will apply</b>
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The existing environmental impacts created by the above mentioned NEMA listed and other non-listed activities in relation to alternative land use, were assessed as follows:

<b>Eskom Power Line</b>	Air quality	No impact	No impact on air quality is expected.
	Fauna	No impact	No impact on fauna is expected.
	Flora	No impact	No impact on flora is expected.
	Ground water	No impact	No impact on groundwater is expected.
	Noise	No impact	No noise impact is expected.
	Soil	No impact	No impact on soil is expected.
	Surface water	No impact	No impact on surface water is expected.
	Topography	No impact	No impact on topography is expected.
	Visual	Negative Very Low	Changing of natural view and breaking of skyline.
<b>R325, Secondary gravel road &amp; Farm roads</b>	Air quality	Negative Low	Vehicle movement causes nuisance dust.
	Fauna	Negative Medium	<ul style="list-style-type: none"> <li>• The creation of gravel roads disturbs and/or destroys the natural habitat of the fauna.</li> <li>• Road kills.</li> </ul>
	Flora	Negative Medium	Where new roads are established, the natural flora will be disturbed and/or destroyed.
	Ground water	Negative Low	Potential pollution of groundwater through hydrocarbon spills of vehicles.
	Noise	Negative Low	Noise from vehicle movement.
	Soil	Negative Low	<ul style="list-style-type: none"> <li>• Soil will be compacted.</li> <li>• Potential pollution of soil through hydrocarbon spills of vehicles.</li> </ul>
	Surface water	Negative Very Low	<ul style="list-style-type: none"> <li>• If roads are not properly maintained, water will cause erosion after a thunder storm event.</li> <li>• Potential pollution of surface water through hydrocarbon spills of vehicles.</li> </ul>
	Topography	No impact	No impact to topography is expected.
	Visual	Negative Very Low	The roads are visible from the immediate surroundings.
<b>Windmills</b>	Air quality	No impact	No impact to air quality is expected.
	Fauna	No impact	No impact to fauna is expected.
	Flora	No impact	No impact to flora is expected.
	Ground water	Negative Very Low	Small amounts of groundwater are abstracted for use at the watering points.
	Noise	Negative Very Low	Windmills have a small noise impact.
	Soil	No impact	No impact to soil is expected.
	Surface water	No impact	No impact to surface water is expected.
	Topography	No impact	No impact to the topography is expected.
	Visual	Negative Very Low	Changing of natural view. Breaking of skyline.

5.2. Description of all potential cumulative impacts of the main features and infrastructure related to the identified alternative land uses or developments.

Impact	Description
Air Quality	• Dust from the farm roads transecting the property.
	• Nuisance dust from the provincial secondary road traversing the property.
	• Smoke from runaway veldt fires.
Fauna	• Hunting and snaring of animals.
	• Road kills.
Flora	• Collecting of medicinal plants.
	• Collecting of firewood.
Ground Water	• Extraction of groundwater for use at windmills.
Noise	• Noise created by traffic.
	• Windmills.
Soil	• Potential hydrocarbon spills from vehicles.
	• Soil compacting on roads.
	• Erosion
Surface Water	• Potential hydrocarbon spills from vehicles.
Topography	• Not applicable
Visual	• Changing of natural view by windmills, gravel roads and Eskom Power Line.

**REGULATION 50(c)**

**6. Identification of potential social and cultural impacts.**

6.1. List of potential impacts of the proposed mining operation on the socio-economic conditions of other parties' land use activities. (Include all the items to be included in the list referred to in the concomitant section of the guideline posted on the official website of the Department.)

	Potential Impact	Type of impact	Description
Capital Expenditure	Monies spent in local economy	Positive	Monies spent on the purchasing of fixed assets and total spent on construction.
Payroll income	Monies earned	Positive	Gross remuneration of employees in terms of salaries and wages.
Operating expenditure and maintenance	Monies spent in local economy	Positive	Monies spent locally by businesses on goods and services.
Revenue	Monies generated locally and nationally	Positive	Value of ore sales arising from mining activities.
Employment	Job creation	Positive	The mining operation provides employment opportunities.
Employment of contractors	Job creation	Positive	The mining operation provides contractual opportunities.
Provision of skills development	Skills development	Positive	The mining operation will provide skills development opportunities.

Opportunities for local SMME's	Business opportunity	Positive	Enterprise development in the community.
Community involvement	Shares	Positive	Income created for the community and business skills.
Poverty alleviation	Social upliftment	Positive	Projects in the community will uplift and alleviate poverty.
Community Health	Awareness creation	Positive	Various awareness programs (HIV, birth control, nutrition etc.)
Community proximity	Dust, noise and visual	Negative	Low levels of nuisance dust; low levels of noise outside proposed mining areas and a limited visual impact from the secondary roads surrounding the mining operation.
Social and Labour Plan	Upliftment of communities and redistribution of wealth	Positive	The mining operation will contribute to the Human Resource Development of its employees and to the Local Economic Development of the Tsantsabane Local Municipality.
Security risk	Loss of life and property.	Negative	Endangerment of lives and increase in theft.

6.2. Description of the cultural aspect that will potentially be affected, and describe the potential impact on such cultural aspect. (In cases where such features are not applicable the applicant must still include the item in the list and describe it as not applicable.)

Feature	Potential Impact	Type of impact	Description
Collecting of medicinal plants	Vegetation	Low negative	Mining will destroy flora at the excavation areas that might be used for medicinal purposes.
Collecting of firewood	Vegetation	Low negative	Trees in the excavation areas will be destroyed that could have been used for firewood purposes.
Hunting & snaring	Fauna	Low positive / negative	Although hunting and snaring forms part of the culture of the community (Maremane), the employees of the mining operation will remove all snares found on the property, which will have a positive impact on the fauna of the property.

6.3. Description of heritage features and the potential impact on such heritage feature. (In cases where such features are not applicable the applicant must still include the item in the list and describe it as not applicable.)

Feature	Potential Impact	Type of impact	Description
Archaeological artefacts	Damage or destruction	Negative	Mining could damage or destruct pre-historic artefacts, should mining take place in areas where these artefacts are present.
Burial grounds and graves	Damage or destruction	Negative	Mining could damage or destruct burial grounds and graves, should

			mining take place in areas where these burial grounds and graves are present.
Buildings and structures older than sixty years and walling sites	Damage or destruction	Negative	Mining could damage or destruct buildings and structures older than sixty years, should mining take place in areas where these buildings and structures are present.

6.4. Quantification of the impact on the socio-economic conditions of directly affected persons, as determined by the findings and recommendations of a specialist report in that regard.

6.4.1. The amount of the quantified potential impact on property or infrastructural assets.

**Livestock farming potential:**

**The economic value of the alternative land use was calculated according to the tried and tested method of the Department of Agriculture's present recommended stocking rate of 12 hectares per large stock unit (LSU).**

**Mining will disturb approximately 150 hectares per annum at full production, which disturbed areas will revert back to its current grazing capacity after 5 years. According to calculations a total area of approximately 750 hectares of grazing land will not be suitable for grazing at any one time (from years 5 - 30). 750 hectares (disturbed land) has the capacity of 62 head of cattle (LSU at 12 units per hectare). Breeding success of 80% calculates to 49 calves per annum. The monetary value of each calf is approximately R4 000 (weaned) (current market price) which calculates to R196 000-00.**

**No impact to existing infrastructure on the property is foreseen, as no mining will be allowed within 100m from any structure.**

**The buildings of the proposed mining operation will be left on the mine site after closure, for use by the surface owner, if so requested by the surface owner, and will have a positive economic impact on the property.**

6.4.2. State the amount of the quantified potential impact on commercial, economic or business activity which will be impacted upon as a result of the mining activity.

	Average of 10 Years
	R000'000
Industrial Output (Gross Sales) – Iron Ore & Manganese	2,310
<b>Expenditure</b>	
Mining	943
Technology	308
Technical Skills Cost	137
Regulatory Requirements	109
Environmental Cost	16
Social and Labour	12
Capital Cost	212
Transport	360
Total Jobs	57
Earnings per job for 10 year average	40,531,387

A summary of the economic impacts is found in the table below. As was already demonstrated in the table above, the plant's direct data consist of R2 310 million in sales or industrial output, R137 million in labour income and 57 jobs from year 1 onwards. This plant is expected to generate R23,7 million in total value added for year 1.

When the direct and the indirect workers convert their labour income into household spending, they will induce an additional R98,6 million in additional sales in the country.

Totals	Direct	Indirect	Induced	Total	Total Multiplier
	R	R	R	R	
Industrial Output	2,310,289,070	98,676,107	8,674,800	2,417,639,977	1.05
Value Added	23,718,003	10,910,282	4,743,601	39,371,885	1.66
Labour Income	8,674,800	3,469,920	1,561,464	13,706,184	1.58
Jobs	57	23	10	90	1.58

The last column in Table 2 contains the total multipliers for each category. A total multiplier is merely the ratio obtained by dividing the total value by the direct value. It tells how much the local economy reacts to a unit change in the direct value. The multiplier of 1.05 for industrial output says that for every R1 of direct industrial output, R0.05 in additional industrial output has been generated in the remaining (non-mining) economy. The multiplier of 1.66 for value added means that for every R1 of value added generated in the

proposed mining operation R0.66 in value added is sustained in the rest of the local economy. The labour income multiplier is 1.58. That means that for every rand's worth of labour income paid in the proposed mining operation R0.58 in labour income is generated in the rest of the local economy. The jobs multiplier is 1.58 which mean that for every 1 person employed at the new proposed mining operation 0.58 new jobs will be created in the local economy.

6.4.3. The sum of the amounts, referred to in paragraphs 6.4.1 and 6.4.2 above.

Description	Amount
<b>The amount of the quantified potential impact on property or infrastructural assets (negative)</b>	<b>R196 000</b>
<b>The amount of the quantified potential impact on commercial, economic or business activity which will be impacted upon as a result of the mining activity (positive)</b>	<b>R2 470 718 046</b>
	<b>R2 470 522 046</b>

## 7. Assessment and evaluation of potential impacts

7.1. List of each potential impact identified in paragraphs 3 and 6 above. (Include all the items to be included in the list referred to in the concomitant section of the guideline posted on the official website of the Department.)

**Mining - Environmental impacts on air quality, fauna, flora, groundwater, noise, soil, surface water, topography & visual:**

- Ablution facilities
- Access control (security)
- Access road
- Chemical toilets
- Diesel tank
- Electricity (gensets)
- Excavations
- Haul roads
- Laboratory
- Offices
- Processing plant
- Recycling dam
- Salvage yard
- Stockpile area
- Storage facilities
- Topsoil storage site
- Wash bay
- Waste areas
- Waste rock dumps
- Water dam

- Weighbridge
- Weighbridge control room
- Workshop
- Acid mine drainage (not applicable)

**Socio-Economic:**

- Capital expenditure
- Payroll income
- Operating expenditure & maintenance
- Revenue
- Employment
- Employment of contractors
- Provision of skills development
- Opportunities for SMME's
- Community involvement
- Poverty alleviation
- Community health
- Community proximity
- Social & Labour Plan
- Security Risk

**Cultural - Environmental impacts on air quality, fauna, flora, groundwater, noise, soil, surface water, topography & visual:**

- Collecting of medicinal plants
- Collecting of firewood
- Hunting & Snaring

**Heritage:**

- Archaeological artefacts
- Burial grounds and graves
- Buildings and structures older than 60 years

**Cumulative environmental impacts:**

- Air quality
- Fauna
- Flora
- Groundwater
- Noise
- Soil
- Surface water
- Topography
- Visual

- 7.2. Concomitant impact rating for each potential impact listed in paragraph 7.1 above in terms of its nature, extent, duration, probability and significance. (Provide a definition of the criteria used for each of the variables used for rating potential impacts and ensure that the potential impacts are rated specifically with the assumption that no mitigation measures are applied.)

## **ASSESSMENT CRITERIA TERMINOLOGY**

The assessment of the impacts has been conducted according to a synthesis of criteria required by the integrated environmental management procedure.

### **Nature of impact**

This is an appraisal of the type of effect the activity would have on the affected environmental component. Its description should include what is being affected, and how.

### **Extent**

The physical and spatial size of the impact. This is classified as follows:

- **Local**  
The impacted area extends only as far as the activity, e.g. a footprint.
- **Site**  
The impact could affect the whole, or a measurable portion of the property.
- **Regional**  
The impact could affect the area including the neighbouring farms, transport routes and the adjoining towns.

### **Duration**

The lifetime of the impact which is measured in the context of the lifetime of the proposed phase (i.e. construction or operation).

- **Short term**  
The impact will either disappear with mitigation or will be mitigated through natural process in a short time period.
- **Medium term**  
The impact will last up to the end of the mining period, where after it will be entirely negated.
- **Long term**  
The impact will continue or last for the entire operational life of the mine, but will be mitigated by direct human action or by natural processes thereafter.
- **Permanent**  
The only class of impact, which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient.

### **Intensity**

This describes how destructive, or benign, the impact is. Does it destroy the impacted environment, alter its functioning, or slightly alter it. These are rated as:



- **Low**  
This alters the affected environment in such a way that the natural processes or functions are not affected.
- **Medium**  
The affected environment is altered, but function and process continue, albeit in a modified way.
- **High**  
Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.

This will be a relative evaluation within the context of all the activities and the other impacts within the framework of the project.

### **Probability**

This describes the likelihood of the impacts actually occurring. The impact may occur for any length of time during the life cycle of the activity, and not at any given time. The classes are rated as follows:

- **Improbable**  
The possibility of the impact occurring is very low, due either to the circumstances, design or experience.
- **Probable**  
There is a possibility that the impact will occur to the extent that provisions must be made therefore.
- **Highly probable**  
It is most likely that the impacts will occur at some or other stage of the development.
- **Definite**  
The impact will take place regardless of any preventative plans, and mitigation measures or contingency plans will have to be implemented to contain the impact.

### **Determination of significance**

Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The classes are rated as follows:

- **No significance**  
The impact is not likely to be substantial and does not require any mitigatory action.
- **Low**  
The impact is of little importance, but may require limited mitigation.
- **Medium**  
The impact is of importance and therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels.

- **High**

The impact is of great importance. Failure to mitigate, with the objective to reduce the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Mitigation is therefore essential.

**Mining - Environmental impacts on air quality, fauna, flora, groundwater, noise, soil, surface water, topography & visual:**

Mining activity	Impact on	Nature	Extent	Duration	Intensity	Probability	Significance
Ablution facilities	Air quality	No impact	No impact	No impact	No impact	No impact	No impact
	Fauna	No impact	No impact	No impact	No impact	No impact	No impact
	Flora	No impact	No impact	No impact	No impact	No impact	No impact
	Groundwater	Negative	Local	Short term	Low	Improbable	Low
	Noise	No impact	No impact	No impact	No impact	No impact	No impact
	Soil	Negative	Local	Short term	Low	Improbable	Low
	Surface Water	No impact	No impact	No impact	No impact	No impact	No impact
	Topography	No impact	No impact	No impact	No impact	No impact	No impact
Visual	Negative	Site	Short term	Low	Definite	Low	
Mining activity	Impact on	Nature	Extent	Duration	Intensity	Probability	Significance
Access control (security)	Air quality	No impact	No impact	No impact	No impact	No impact	No impact
	Fauna	No impact	No impact	No impact	No impact	No impact	No impact
	Flora	No impact	No impact	No impact	No impact	No impact	No impact
	Groundwater	Negative	Local	Short term	Low	Probable	Low
	Noise	Negative	Local	Short term	Low	Probable	Low
	Soil	Negative	Local	Short term	Low	Improbable	Low
	Surface Water	Negative	Local	Short term	Low	Probable	Low
	Topography	No impact	No impact	No impact	No impact	No impact	No impact
Visual	Negative	Site	Short term	Low	Definite	Low	
Mining activity	Impact on	Nature	Extent	Duration	Intensity	Probability	Significance
Access Road	Air quality	Negative	Local	Long term	Low	Definite	Low
	Fauna	Negative	Local	Long term	Medium	Definite	Medium
	Flora	Negative	Local	Long term	Medium	Definite	Medium
	Groundwater	Negative	Local	Long term	Low	Probable	Low
	Noise	Negative	Local	Long term	Low	Definite	Low
	Soil	Negative	Local	Long term	Low	Definite	Low
	Surface Water	Negative	Local	Long term	Low	Probable	Low
	Topography	No impact	No impact	No impact	No impact	No impact	No impact
Visual	Negative	Site	Long term	Low	Definite	Low	
Mining activity	Impact on	Nature	Extent	Duration	Intensity	Probability	Significance
Chemical toilets	Air quality	No impact	No impact	No impact	No impact	No impact	No impact
	Fauna	No impact	No impact	No impact	No impact	No impact	No impact
	Flora	No impact	No impact	No impact	No impact	No impact	No impact
	Groundwater	Negative	Local	Short term	Low	Improbable	Low
	Noise	No impact	No impact	No impact	No impact	No impact	No impact
	Soil	Negative	Local	Short term	Low	Improbable	Low
	Surface Water	No impact	No impact	No impact	No impact	No impact	No impact
	Topography	No impact	No impact	No impact	No impact	No impact	No impact
Visual	Negative	Site	Short term	Low	Definite	Low	
Mining activity	Impact on	Nature	Extent	Duration	Intensity	Probability	Significance
Diesel tank	Air quality	Negative	Local	Long term	Low	Definite	Low
	Fauna	Negative	Site	Long term	Medium	Definite	Medium
	Flora	Negative	Site	Long term	Medium	Definite	Medium
	Groundwater	Negative	Local	Long term	Low	Probable	Low
	Noise	Negative	Local	Long term	Low	Definite	Low
	Soil	Negative	Local	Long term	Medium	Definite	Medium
	Surface Water	Negative	Local	Long term	Low	Probable	Low
	Topography	No impact	No impact	No impact	No impact	No impact	No impact
Visual	Negative	Site	Long term	Low	Definite	Low	