# APPENDIX A: IMPACT ASSESSMENT TABLES
# 10131MR NOUS WEST GRANITE MINE

## Table 1: Impact Assessment during Construction Phase

| CONSTRUCTION PHASE: SITE ACCESS AND SITE ESTABLISHMENT | | |
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| **Potential impact and risk:** **Loss of topsoil, increased dust levels, and soil compaction** | **IMPACT 1: SOIL EROSION & SOIL COMPACTION: The clearing of areas for waste dump extensions or extensions to logistics will result in the removal of existing vegetation and topsoil, which will disturb the soil increasing the potential for soil erosion by wind and loss of soil in the event of rainfall. Soil compaction will result from ongoing repeated use of access tracks.** | |
| **ALTERNATIVE** | **PREFERRED AND ONLY ALTERNATIVE** | **NO-GO ALTERNATIVE** |
| Nature of impact: | Negative | N/A |
| Extent and duration of impact: | Site and Short term | N/A |
| Consequence of impact or risk: | Loss | N/A |
| Probability of occurrence: | Probable | N/A |
| Degree to which the impact may cause irreplaceable loss of resources: | Low | N/A |
| Degree to which the impact can be reversed: | Reversible | N/A |
| Indirect impacts: | Dust impacting on adjacent vegetation and causing a nuisance to workers.<br>Compaction of topsoil where vehicles drive outside demarcated areas damages seed bank and habitat for invertebrates. | N/A |
| Cumulative impact prior to mitigation: | Medium | N/A |
| Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High) | Medium | |
| Degree to which the impact can be **avoided**: | High | N/A |
| Degree to which the impact can be **managed:** | High | N/A |
| Degree to which the impact can be **mitigated**: | High | N/A |
| Proposed mitigation: | • After clearing, the affected area shall be stabilized to prevent any erosion or sediment runoff. Stabilized areas shall be demarcated accordingly.<br>• Incremental clearing of ground cover should take place to avoid unnecessary exposed surfaces.<br>• Reasonable measures must be undertaken to ensure that any exposed areas are adequately protected against the wind and potential stormwater run-off.<br>• Top soil shall be removed separately and stockpiled separately from other soil base layers.<br>• The stockpile areas for topsoil are temporary as they will be re-used on a cut and fill basis.<br>• Stockpiles should ideally be located to create the least visual impact and must be maintained to avoid erosion of the material.<br>• Topsoil storage areas must be convex and should not exceed 2m in height.<br>• Topsoil must be treated with care, must not be buried or in any other way be rendered unsuitable for further use (e.g. by mixing with spoil) and precautions must be taken to prevent unnecessary handling and compaction.<br>• In particular, topsoil must not be subject to compaction greater than 1 500 kg/m² and must not be pushed by a bulldozer for more than 50 metres. Trucks may not be driven over the stockpiles. | N/A |

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| | • Reduce drop height of material to a minimum.<br>• Temporarily halt material handling in windy conditions.<br>• A speed limit of 30km/hour will be displayed and enforced through a fining system. All vehicle drivers using the access road and entering the site will be informed of the speed limit.<br>• Soil erosion and compaction on the section of public roads used by the Applicant (as shown on Diagram 3.4 in Section 3.5) is required to be monitored and timeously repaired.<br>• Soil erosion on private haul roads is to be regularly monitored and repaired.<br>• Compacted areas that are not required for access shall be scarified after use during decommissioning and rehabilitation. | |
| Residual impacts: | Potential loss of invertebrates that live in the top layers of the soil. | N/A |
| Cumulative impact post mitigation: | Low | N/A |
| Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High) | Low | N/A |
| **Potential impact and risk:**<br>**Potential Impacts on Water Resources** | **IMPACT 2: WATER RESOURCES: Potential for ground water pollution due to oil spills during routine maintenance of equipment. Management of existing boreholes with limited use of groundwater during site establishment. The Nous River is a non-perennial river with a Category B "largely natural" rating. No permanent surface water resources are in close proximity to the quarries or mining logistics.** | |
| **ALTERNATIVE** | **PREFERRED AND ONLY ALTERNATIVE** | **NO-GO ALTERNATIVE** |
| Nature of impact: | Negative | N/A |
| Extent and duration of impact: | Site & Short term | N/A |
| Consequence of impact or risk: | Loss | N/A |
| Probability of occurrence: | Unlikely | N/A |
| Degree to which the impact may cause irreplaceable loss of resources: | Low | N/A |
| Degree to which the impact can be reversed: | Reversible | N/A |
| Indirect impacts: | Rainfall is very seldom and evaporation rate is very high. Indirect impacts on surface water are very unlikely. | N/A |
| Cumulative impact prior to mitigation: | High | N/A |
| Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High) | High | |
| Degree to which the impact can be **avoided**: | High | N/A |
| Degree to which the impact can be **managed:** | High | N/A |
| Degree to which the impact can be **mitigated**: | High | N/A |
| Proposed mitigation: | • Ensure adequate capping or sealing of the boreholes to prevent infiltration of potentially contaminated surface water leading to chemical or biological contamination of groundwater.<br>• Oils and lubricants must be stored within sealed containment structures.<br>• Any mechanical equipment maintenance must be undertaken on drip trays or UPVC sheets to prevent spills/ leaks onto the soil.<br>• When not in use, a drip tray must be placed beneath mechanical equipment and vehicles.<br>• Machinery must be kept in good working order and regularly inspected for leaks.<br>• A spill kit will be available on each site where mining activities are in progress.<br>• Any spillages will be cleaned up immediately and treated in the bio-cells (soil farms) which are located on the adjacent mine. | N/A |

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| | • Waste materials generated on site must be stored in suitable lidded containers and removed off site to a suitable disposal facility.<br>• Waste separation must be undertaken if practical for recycling<br>• Provide all workers with environmental awareness training and comply with the requirements of the EMPr.<br>• Provide a bin at the site and provide a mobile ablution facility.<br>• Drinking water to be brought on site as per existing practices.<br>• Use of borehole water for construction purposes is to be sourced from existing raw water collection ponds. | |
| Residual impacts: | Disposal of contaminated soil on site at the mine's headquarters. | N/A |
| Cumulative impact post mitigation: | Medium-Low | N/A |
| Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High) | Medium-Low | N/A |
| **Potential impact and risk:**<br>**Potential Impacts on Biodiversity** | **IMPACT 3: LIMITED LOSS OF NATURAL VEGETATION AND ECOLOGICAL FUNCTIONING IN A CRITICAL BIODIVERSITY AREA 2 (CBA 2)** | |
| **ALTERNATIVE** | **PREFERRED AND ONLY ALTERNATIVE** | **NO-GO ALTERNATIVE** |
| Nature of impact: | Negative | N/A |
| Extent and duration of impact: | Site & Short term | N/A |
| Consequence of impact or risk: | Loss | N/A |
| Probability of occurrence: | Definite | N/A |
| Degree to which the impact may cause irreplaceable loss of resources: | Low | N/A |
| Degree to which the impact can be reversed: | Reversible | N/A |
| Indirect impacts: | • Soil disturbance caused by vegetation clearing will provide suitable conditions for the establishment and spreading of alien invasive vegetation.<br>• Removal of alien invasive vegetation if required, is a positive impact, and will benefit the ecological functioning. | N/A |
| Cumulative impact prior to mitigation: | Low | N/A |
| Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High) | Low | N/A |
| Degree to which the impact can be **avoided**: | Medium | N/A |
| Degree to which the impact can be **managed:** | Medium | N/A |
| Degree to which the impact can be **mitigated**: | Medium | N/A |
| Proposed mitigation: | • Refer to **Diagram 3.0 and Diagrams 3.1 to 3.8,** which show the proposed areas for mining and the existing tracks that will be used. Most quarries are extensions to existing or historic quarries, where little vegetation naturally occurs.<br>• Remove alien invasive vegetation if required and ensure ongoing alien vegetation clearing in the area.<br>• No indigenous plants outside of the demarcated work areas may be damaged.<br>• Identify protected tree species, and leave these intact, such as Camelthorn trees.<br>• The noise and vibration caused by the earthmoving equipment will disturb smaller animals (e.g. snakes). These will move away whilst operations are in progress. Should any animals be | N/A |

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| | encountered these should be moved away by a suitably trained nature conservation officer, if necessary.<br>• The Yellow Quarry boundary is to be fenced as per Diagram 3.4 in Section 3.5, which will help prevent illegal access from poachers, and neighbouring livestock from entering the Yellow Quarry mining area to browse on the natural vegetation. | |
| Residual impacts: | The local fauna is familiar with the existing mining activities on site. | N/A |
| Cumulative impact post mitigation: | Very-Low | N/A |
| Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High) | Very-Low | N/A |
| **Potential impact and risk:**<br>**Contamination & Pollution** | **IMPACT 4: POTENTIAL FOR SOIL CONTAMINATION, AND WASTE MANAGEMENT DURING CONSTRUCTION PHASE** | |
| **ALTERNATIVE** | **PREFERRED AND ONLY ALTERNATIVE** | **NO-GO ALTERNATIVE** |
| Nature of impact: | Negative | N/A |
| Extent and duration of impact: | Site & Short term | N/A |
| Consequence of impact or risk: | Loss | N/A |
| Probability of occurrence: | Possible | N/A |
| Degree to which the impact may cause irreplaceable loss of resources: | Low | N/A |
| Degree to which the impact can be reversed: | Reversible | N/A |
| Indirect impacts: | Windblown litter will cause visual blight.<br>Hydrocarbons are toxic and will cause vegetation die-back and soil poisoning. | N/A |
| Cumulative impact prior to mitigation: | Medium | N/A |
| Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High) | Medium | N/A |
| Degree to which the impact can be **avoided**: | High | N/A |
| Degree to which the impact can be **managed:** | High | N/A |
| Degree to which the impact can be **mitigated**: | High | N/A |
| Proposed mitigation: | • Oils and lubricants must be stored within sealed containment structures.<br>• Any mechanical equipment maintenance must be undertaken on drip trays or UPVC sheets to prevent spills/ leaks onto the soil.<br>• When not in use, a drip tray must be placed beneath mechanical equipment and vehicles.<br>• Machinery must be kept in good working order and regularly inspected for leaks.<br>• A spill kit will be available on each site where mining activities are in progress.<br>• Any spillages will be cleaned up immediately.<br>• Waste materials generated on site must be stored in suitable lidded containers and removed off site to a suitable disposal facility.<br>• Waste separation must be undertaken.<br>• Provide all workers with environmental awareness training.<br>• Provide a bin at the site.<br>• Regularly dispose of any solid waste at a municipal waste disposal site.<br>• Ensure all workers comply with the requirements of the EMPr.<br>• Provide mobile ablution facilities. | N/A |
| Residual impacts: | A lack of waste food management encourages vermin. | N/A |

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| Cumulative impact post mitigation: | Low | N/A |
| Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High) | Low | N/A |
| **Potential impact and risk:**<br>**Potential Impacts on Visual Landscape** | **IMPACT 5: VISUAL INTRUSION: Caused by machinery, topsoil stockpiles, cleared areas, and movement of trucks on site during preparation of site establishment. The site is remote and rural in nature with very few receptors (people or nearby public roads) and is located on private property.** | |
| **ALTERNATIVE** | **PREFERRED AND ONLY ALTERNATIVE** | **NO-GO ALTERNATIVE** |
| Nature of impact: | Negative | N/A |
| Extent and duration of impact: | Site & Short term | N/A |
| Consequence of impact or risk: | Loss | N/A |
| Probability of occurrence: | Definite | N/A |
| Degree to which the impact may cause irreplaceable loss of resources: | Low | N/A |
| Degree to which the impact can be reversed: | Reversible | N/A |
| Indirect impacts: | There are few indirect impacts as the area is remote and rural, with no people (receptors) living near the site. | N/A |
| Cumulative impact prior to mitigation: | Low | N/A |
| Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High) | Low | N/A |
| Degree to which the impact can be **avoided**: | Medium | N/A |
| Degree to which the impact can be **managed:** | Medium | N/A |
| Degree to which the impact can be **mitigated**: | Medium | N/A |
| Proposed mitigation: | • The construction areas shall be kept neat and tidy at all times. Equipment must be kept in designated areas and storing/stockpiling shall be kept orderly. | N/A |
| Residual impacts: | Good housekeeping will ensure a neat and well-maintained construction area reducing visual impact. | N/A |
| Cumulative impact post mitigation: | Very Low | N/A |
| Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High) | Very Low | N/A |
| **Potential impact and risk:**<br>**Potential Impacts on Social, and Biophysical Environments** | **IMPACT 6: EMMISSIONS (DUST, VEHICLES & NOISE): Noise and dust will be created by mining equipment (e.g. front-end loaders) and vehicles, which will emit Greenhouse Gases.** | |
| | **PREFERRED AND ONLY ALTERNATIVE** | **NO-GO ALTERNATIVE** |
| Nature of impact: | Negative | N/A |
| Extent and duration of impact: | Local & Short Term | N/A |
| Consequence of impact or risk: | Loss | N/A |
| Probability of occurrence: | Definite | N/A |
| Degree to which the impact may cause irreplaceable loss of resources: | Low | N/A |
| Degree to which the impact can be reversed: | Reversible | N/A |

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| Indirect impacts: | • Carbon emissions from vehicle exhausts have a negative impact on the ozone layer.<br>• Local residents along the access tracks and roads would be impacted on by noise, dust and vehicle emissions during the construction activities.<br>• Increase in Greenhouse Gas Emissions from vehicles. | N/A |
| Cumulative impact prior to mitigation: | Low | N/A |
| Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High) | Low | N/A |
| Degree to which the impact can be **avoided**: | Medium | N/A |
| Degree to which the impact can be **managed:** | Medium | N/A |
| Degree to which the impact can be **mitigated**: | Medium | N/A |
| Proposed mitigation: | • The Applicant shall adhere to the local by-laws and regulations regarding the noise and associated hours of operations.<br>• The Applicant shall limit noise levels (e.g. install and maintain silencers on machinery). The provisions of SANS 1200A Sub clause 4.1 regarding "built-up" area shall apply to all areas within audible distance of residents whether in urban, peri-urban or rural areas.<br>• Construction and demolition activities generating output of 85dB or more, shall be limited to normal working hours and not allowed during weekends to limit the impact of noise of neighbours. No amplified music shall be allowed on site.<br>• Hauling vehicles shall adhere to municipal and provincial traffic regulations including speed limits.<br>• Vehicles used on site for the construction related activities shall be maintained and in a good working condition so as to reduce emissions.<br>• Engines shall be turned off when the vehicle is temporarily parked or stationery for long periods.<br>• Stockpiles must be maintained (covered where necessary) to avoid wind erosion of the material.<br>• Incremental clearing of ground cover should take place to avoid unnecessary exposed surfaces. | N/A |
| Residual impacts: | Carbon emissions have impact on climate change. | N/A |
| Cumulative impact post mitigation: | Very Low | N/A |
| Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High) | Very Low | N/A |
| **Potential impact and risk:**<br>**Potential Impacts on Heritage, Paleontological and Cultural landscape** | **IMPACT 7: POTENTIAL FOR HERITAGE, PALAEONTOLOGICAL AND CULTURAL IMPACTS:**<br>**The stone walled kraal (D011) should be excluded from quarrying; no further archaeological studies or mitigation is required for the areas examined for this report; and no further palaeontological studies or mitigation is required. Refer to Appendix C.** | |
| **ALTERNATIVE** | **PREFERRED AND ONLY ALTERNATIVE** | **NO-GO ALTERNATIVE** |
| Nature of impact: | Negative for low significant finings; Neutral for potential grave. | N/A |
| Extent and duration of impact: | Local & Long term | N/A |
| Consequence of impact or risk: | Loss for low significant finings; no loss for potential grave. | N/A |
| Probability of occurrence: | Definite for low significant fining; unlikely for potential grave | N/A |
| Degree to which the impact may cause irreplaceable loss of resources: | No loss (according to Specialist Report). | N/A |
| Degree to which the impact can be reversed: | Irreversible for low significance findings | N/A |
| Indirect impacts: | Loss of context of insignificant findings. | N/A |
| Cumulative impact prior to mitigation: | Low for insignificant findings | N/A |
| Significance rating of impact prior to | Low for insignificant findings | N/A |

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| mitigation (e.g. Low, Medium, Medium-High, High, or Very-High) | | |
| Degree to which the impact can be **avoided**: | Very low for insignificant findings | N/A |
| Degree to which the impact can be **managed:** | Very low for insignificant findings | N/A |
| Degree to which the impact can be **mitigated**: | Very low for insignificant findings | N/A |
| Proposed mitigation: | None required for insignificant findings .<br>Demarcate the stone walled kraal (D011) as a no-go area. | N/A |
| Residual impacts: | None identified for insignificant findings | N/A |
| Cumulative impact post mitigation: | Low | N/A |
| Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High) | Low | N/A |
| **Potential impact and risk:**<br>**Potential Impacts on Socio-Economic Environment** | **IMPACT 8: CREATION OF EMPLOYMENT & JOB SECURITY DURING CONSTRUCTION PHASE WITH LOCAL AND REGIONAL ECONOMIC SPIN-OFFS** | |
| **ALTERNATIVE** | **PREFERRED AND ONLY ALTERNATIVE** | **NO-GO ALTERNATIVE** |
| Nature of impact: | Positive | Negative |
| Extent and duration of impact: | Local, District and Short term | Local, District & Short Term |
| Consequence of impact or risk: | Gain | Loss |
| Probability of occurrence: | Definite | Definite |
| Degree to which the impact may cause irreplaceable loss of resources: | No Loss | Medium |
| Degree to which the impact can be reversed: | Irreversible (employment can be lost by an individual due to non-performance but the job provision is irreversible) | Reversible |
| Indirect impacts: | • Upskilling<br>• Local economic spin-offs through increased income earned, and through purchasing of local materials<br>• Income generation for landowners in a time of severe drought where livestock farming is not sustainable. | • No upskilling<br>• No local economic spin-offs from purchase of equipment and goods for construction phase.<br>• Opportunity cost for landowner and applicant. |
| Cumulative impact prior to mitigation: | Medium (-) | Medium (-) |
| Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High) | Low (-) | Medium (-) |
| Degree to which the impact can be **avoided**: | Very low | Medium |
| Degree to which the impact can be **managed:** | High | Medium |
| Degree to which the impact can be **mitigated**: | High | Medium |
| Proposed mitigation: | • Employment of local previously disadvantaged labour wherever possible, with provision of training (upskilling) | No mitigation possible with No-Go alternative. |
| Residual impacts: | The upliftment of unemployed people, with positive impact on standard of living for their families.<br>Local and regional economic spin-offs from investment through Social Labour Plan. | No job creation or potential for upskilling of previously disadvantaged labour, and no |

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| | | ongoing supply of granite. |
| Cumulative impact post mitigation: | Medium (+) | Medium (-) |
| Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High) | Medium (+) | Medium (-) |

## Table 2: Impact Assessment during Operational Phase

| **OPERATIONAL PHASE** | | |
|---|---|---|
| **Potential impact and risk:**<br>**Change in Topography** | **IMPACT 1: CHANGE IN TOPOGRAPHY: Granite mining operations commonly have a permanent impact on rock masses that influences the topography on the site and can impact post-mining slope stability.** | |
| **ALTERNATIVE** | **PREFERRED AND ONLY ALTERNATIVE** | **NO-GO ALTERNATIVE** |
| Nature of impact: | Negative | N/A |
| Extent and duration of impact: | Site & Long term | N/A |
| Consequence of impact or risk: | Loss | N/A |
| Probability of occurrence: | Definite | N/A |
| Degree to which the impact may cause irreplaceable loss of resources: | High | N/A |
| Degree to which the impact can be reversed: | Irreversible | N/A |
| Indirect impacts: | Increase in habitat creation for fauna (rock hyrax and lizards) on waste rock dumps. | N/A |
| Cumulative impact prior to mitigation: | High | N/A |
| Significance rating of impact prior to mitigation<br>(e.g. Low, Medium, Medium-High, High, or Very-High) | High | N/A |
| Degree to which the impact can be **avoided**: | Medium | N/A |
| Degree to which the impact can be **managed:** | Medium | N/A |
| Degree to which the impact can be **mitigated**: | Medium | N/A |
| Proposed mitigation: | The focus of topographic rehabilitation may not be obvious at the time of mine planning and must be addressed as the mine develops and the Closure Plan must be reviewed periodically for continued relevance in the light of changed mine path or long-term plans.<br>Implementation of the following tasks to manage the risks associated with high wall stability of each quarry and slope stability of the waste dumps will ensure a safe post mining landscape without the requirement for long term monitoring and management. Regular inspections and audits will be used as management system to ensure compliance.<br>• Due to cutting with circular saws smaller and vertical benches of average 1m are created that can be planned so as to prevent an excessive highwall remaining.<br>• During construction terrain form will be used to shield the opencast pit from developed or sensitive areas as protection in the unlikely event of highwall or slope collapse.<br>• During production the height of highwalls will be reduced by separating benches to increase stability.<br>• Overall slope angle between 60° and 70° will fit in with the natural topography of the mountainous | N/A |

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| | terrain and due to the massive and competent nature of the ore body will still be stable.<br>• At final closure geotechnical investigations will identify unstable rock conditions, slopes that require support in the short-, medium- and long-term. Geotechnical slope stabilisation methods including concreting (gunnite), rock bolting, wire mesh restraint, bench wrecking to lower highwalls, rehabilitative blasting etc. which will be investigated and implemented during decommissioning.<br>• A row of blocks will be packed in a straight line at the base of the high wall to reduce the overall height as an additional preventative measure, minimizing safety risks. After the rehabilitation phase no maintenance will be required as the blocks will be permanent fixtures that can only be moved via front end loaders.<br>• The final slope of the pit floor would be towards the drainage channel to prevent collection of storm water.<br>• During operations pump rainwater that collects in the pit and store for use as process water or dust suppression.<br>• Any remaining high wall will be fenced off at final closure in order to deter people or animals from falling over.<br>• At final closure of the operation all remaining product (blocks) from the demarcated stockpile will be restored to pits wherever possible to reduce highwall height and provide surface for rehabilitation or used to fill any remaining deep excavations if any.<br>• Waste dumps must be designed to meet minimum slope stability and safety standards and vegetated to reduce erosion and runoff.<br>• In view of the fact that the mountainous terrain consists of natural depressions along the slope, and the limited topsoil available the best option for waste dumps is filling and levelling the top of these natural depressions, called “valley fill”. The natural angle of repose of 37° for granite waste dumps is compatible with the natural rocky terrain with steep slopes and no terracing will be required.<br>• Waste dumps on the sides of kopjes “sidehill fill”, which have large slopes will be terraced once the dump has reached its final profile at the top level, by dumping additional material along the sides at progressively lower levels, and developing these terraces at differing angles. Final reclamation will thus only occur toward the end of the life of the quarry.<br>• In the case of waste dumps in the valleys “heaped fill” excavations with the final designed perimeter of the dump will be created to obtain cover material for the top of the dumps and profiling the slope of historic dumps to be re-used. The excavations will serve as a base for extending the waste dump. Thereafter, dumping will proceed above surface on the top of this buried dump at successive tiers with appropriate height around 6-10m, leaving terraces of 6m wide, and working from the perimeter toward the centre. This will allow for reclamation of the outside profiles at a much earlier stage, resulting in very little outstanding reclamation toward the end of the life of the dump.<br>• The main closure objective therefore is to leave the site in as safe and self-sustaining a condition as possible and in a situation where no post-closure intervention is required. The aim is to ensure that the affected environment is maintained in a stable condition that will not be detrimental to the safety and health of humans and animals and that will not pollute the environment or lead to the degradation thereof. The aesthetic value of the area will also be reinstated.<br>• The basic rehabilitation methodology will therefore strive to replicate the pre-mining topography, wherever possible, or at least not to increase overall slope gradients without emplacement of adequately designed erosion control or runoff diversion structures. | |
| Residual impacts: | • Visual change in landscape and topography following rehabilitation.<br>• Creation of new habitats. | N/A |
| Cumulative impact post mitigation: | Medium | N/A |
| Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or | Medium | N/A |

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| Very-High) | | |
| **Potential impact and risk:**<br>**Loss of soil, increased dust levels, and soil compaction** | **IMPACT 2: SOIL EROSION & SOIL COMPACTION: The potential for soil erosion by wind and storm water run-off; soil compaction from repeated use of access tracks.** | |
| **ALTERNATIVE** | **PREFERRED AND ONLY ALTERNATIVE** | **NO-GO ALTERNATIVE** |
| Nature of impact: | Negative | N/A |
| Extent and duration of impact: | Site & Long term | N/A |
| Consequence of impact or risk: | Loss | N/A |
| Probability of occurrence: | Definite | N/A |
| Degree to which the impact may cause irreplaceable loss of resources: | Medium | N/A |
| Degree to which the impact can be reversed: | Reversible | N/A |
| Indirect impacts: | • Dust impacting on adjacent vegetation decreasing palatability for livestock and fauna, and causing a nuisance to workers.<br>• Compaction of topsoil damages seed bank and habitat for invertebrates. | N/A |
| Cumulative impact prior to mitigation: | Medium | N/A |
| Significance rating of impact prior to mitigation<br>(e.g. Low, Medium, Medium-High, High, or Very-High) | Medium | N/A |
| Degree to which the impact can be **avoided**: | Medium | N/A |
| Degree to which the impact can be **managed:** | Medium | N/A |
| Degree to which the impact can be **mitigated**: | Medium | N/A |
| Proposed mitigation: | • After clearing, the affected area shall be stabilized to prevent any erosion or sediment runoff. Stabilized areas shall be demarcated accordingly.<br>• Incremental clearing of vegetation should take place to avoid unnecessary exposed surfaces.<br>• Reasonable measures must be undertaken to ensure that any exposed areas are adequately protected against the wind and storm water run-off.<br>• Stockpiles should ideally be located to create the least visual impact and must be maintained to avoid erosion of the material.<br>• Reduce drop height of material to a minimum.<br>• Temporarily halt material handling in windy conditions.<br>• A speed limit of 30km/hour will be displayed and enforced through a fining system. All vehicle drivers using the access road and entering the site will be informed of the speed limit.<br>• Compacted areas that are not required for access shall be scarified after use during decommissioning and rehabilitation.<br>• The basic rehabilitation methodology will therefore strive to replicate the pre-mining topography, wherever possible, or at least not to increase overall slope gradients without emplacement of adequately designed erosion control or runoff diversion structures.<br>• Provision must also be made for efficient storm water control to prevent erosion of roadways.<br>• Soil erosion and compaction on the section of public road used by the Applicant (as shown on Diagram 3.4 in Section 3.5) is required to be monitored and timeously repaired.<br>• Soil erosion on private haul roads is to be regularly monitored and repaired. | N/A |
| Residual impacts: | • Unmanaged soil erosion will result in loss of topsoil.<br>• Unmanaged dust from unsurfaced roads will cause a nuisance and impact on the health of the | N/A |

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| | workers.<br>• Dust impacting on adjacent vegetation decreasing palatability for livestock and fauna. | |
| Cumulative impact post mitigation: | Low | N/A |
| Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High) | Low | N/A |
| **Potential impact and risk:**<br>**Potential Impacts on Water Resources** | **IMPACT 3: WATER RESOURCES: Process water is obtained from existing boreholes on the property. The sustainable yield of the groundwater is to be investigated and a WULA for abstraction for full production volumes is in progress. Water is recycled from the mining operations, and will be recycled from the effluent purification and recycling system to be installed at the ablution facilities. Storage consists of a 5000 litre plastic tank that can be re-used. Water reticulation is provided to the mine work area to feed water to the logistics, where water is recycled. No natural permanent surface water resources are located within the project site. Due to semi-arid conditions the opencast pits will not intercept shallow groundwater table zones. Any hydrocarbon spillages have low potential to contaminate groundwater.** | |
| **ALTERNATIVE** | **PREFERRED AND ONLY ALTERNATIVE** | **NO-GO ALTERNATIVE** |
| Nature of impact: | Negative | N/A |
| Extent and duration of impact: | Site & Long term | N/A |
| Consequence of impact or risk: | Loss | N/A |
| Probability of occurrence: | Unlikely | N/A |
| Degree to which the impact may cause irreplaceable loss of resources: | Low | N/A |
| Degree to which the impact can be reversed: | Reversible | N/A |
| Indirect impacts: | • Rainfall is very seldom and evaporation rate is very high. Indirect impacts on surface water are very unlikely.<br>• Should natural surface run-off occur on excavated surfaces that are being actively mined, it could pool in areas of accumulated water being re-used for cooling of saw blades. | N/A |
| Cumulative impact prior to mitigation: | High | N/A |
| Significance rating of impact prior to mitigation<br>(e.g. Low, Medium, Medium-High, High, or Very-High) | High | N/A |
| Degree to which the impact can be **avoided**: | Medium | N/A |
| Degree to which the impact can be **managed:** | High | N/A |
| Degree to which the impact can be **mitigated**: | High | N/A |
| Proposed mitigation: | • Water used for cooling of saw blades together with the fine residue (cutting spoils) will be collected in a series of settling dams from where the water will be recycled.<br>• Ensure maintenance of boreholes and reticulation pipes for supply to each quarry.<br>• Ensure adequate capping or sealing of the boreholes to prevent infiltration of potentially contaminated surface water leading to chemical or biological contamination of groundwater.<br>• Ensure water abstraction is within allowable limits set by the Department of Water & Sanitation | N/A |

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| | (DWS). Any conditions set by DWS in the license approval process will need to be adhered to.<br>• Ensure that an effluent purification and recycling system is installed at the ablution facilities located at the Yellow and Cape Spring Quarries. | |
| Residual impacts: | Stored raw water provides drinking water for local fauna. | N/A |
| Cumulative impact post mitigation: | Medium-High | N/A |
| Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High) | Medium-High | N/A |
| **Potential impact and risk:**<br>**Potential Impacts on Biodiversity** | **IMPACT 4: LIMITED LOSS OF NATURAL VEGETATION AND ECOLOGICAL FUNCTIONING IN AN CRITICAL BIODIVERSITY AREA 2 (CBA 2): The proposed mining area footprint per quarry will result in an impact on localised ecological functioning, although limited as: bulk sampling, prospecting and mining has already occurred; the granite is mostly devoid of vegetation; access and haul roads exist.. Transport of materials will be along existing access tracks resulting in little impact on ecological functioning at a local level during the operation phase. The machinery and trucks will continue to disturb local fauna, already accustomed to the existing mining activities.** | |
| **ALTERNATIVE** | **PREFERRED AND ONLY ALTERNATIVE** | **NO-GO ALTERNATIVE** |
| Nature of impact: | Negative | N/A |
| Extent and duration of impact: | Site & Long term | N/A |
| Consequence of impact or risk: | Loss | N/A |
| Probability of occurrence: | Definite | N/A |
| Degree to which the impact may cause irreplaceable loss of resources: | Low | N/A |
| Degree to which the impact can be reversed: | Irreversible | N/A |
| Indirect impacts: | • Soil disturbance caused by vegetation clearing will provide suitable conditions for the establishment and spreading of alien invasive vegetation.<br>• Removal of alien invasive vegetation is a positive impact, and will benefit the ecological functioning. | N/A |
| Cumulative impact prior to mitigation: | Medium | N/A |
| Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High) | Medium | N/A |
| Degree to which the impact can be **avoided**: | Medium | N/A |
| Degree to which the impact can be **managed:** | High | N/A |
| Degree to which the impact can be **mitigated**: | High | N/A |
| Proposed mitigation: | • Refer to **Diagrams 3.1, 3.2 and 3.3,** which show that existing access tracks will be used.<br>• The mining area and stockpile areas must be demarcated and the footprint contained within the demarcated areas as shown on **Diagrams 3.1, 3.2 and 3.3.**<br>• The annual rehabilitation plan must be implemented.<br>• Remove alien invasive vegetation, and ensure ongoing alien vegetation clearing should this be required.<br>• No indigenous plants outside of the demarcated work areas may be damaged.<br>• The noise and vibration caused by the earthmoving equipment will disturb smaller animals. These will move away whilst operations are in progress. Should any animals be encountered these should be moved away by a suitably trained nature conservation officer, if necessary. | N/A |

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| | • Regular maintenance of the boundary fence around the Yellow Quarry is required. | |
| Residual impacts: | Increase in habitat creation for fauna (rock hyrax and lizards) on waste rock dumps. | N/A |
| Cumulative impact post mitigation: | Low | N/A |
| Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High) | Low | N/A |
| **Potential impact and risk:**<br>**Contamination & Pollution** | **IMPACT 5: POTENTIAL FOR SOIL AND GROUND WATER CONTAMINATION, AND WASTE MANAGEMENT DURING OPERATIONAL PHASE: Waste collected in settling dams; waste rock; overburden; sub-economic economic lower grade ore; industrial waste (hazardous wastes, oil & greases); domestic waste; waste water, including effluent & sewage sludge** | |
| **ALTERNATIVE** | **PREFERRED AND ONLY ALTERNATIVE** | **NO-GO ALTERNATIVE** |
| Nature of impact: | Negative | N/A |
| Extent and duration of impact: | Site & Short term | N/A |
| Consequence of impact or risk: | Loss | N/A |
| Probability of occurrence: | Possible | N/A |
| Degree to which the impact may cause irreplaceable loss of resources: | Medium | N/A |
| Degree to which the impact can be reversed: | Reversible | N/A |
| Indirect impacts: | Windblown litter will cause visual blight.<br>Hydrocarbons are toxic and will cause vegetation die-back and soil poisoning.<br>A lack of waste food management encourages vermin. | N/A |
| Cumulative impact prior to mitigation: | High | N/A |
| Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High) | High | N/A |
| Degree to which the impact can be **avoided**: | Medium | N/A |
| Degree to which the impact can be **managed:** | High | N/A |
| Degree to which the impact can be **mitigated**: | High | N/A |
| Proposed mitigation: | • **Waste that is collected within the settling dams**<br>- The physical properties required of a successful dimension stone and due to the requirement for inert materials which are not affected by weathering (and in today's context, the effect of severe chemically polluted atmospheric environments), dimension stone residues are typically benign from a pollution point of view.<br>- Water used for cooling of saw blades together with the fine residue (cutting spoils) will be collected in a series of settling dams from where the water will be re-used.<br>- Sludge collected within the settling ponds will be disposed of within the waste rock dump.<br><br>• **Waste rock from the mining process**<br>- Like natural aggregates, dimension stone is used in its natural state, and does not require concentration and extraction from an ore. It is these latter two processes that result in significant environmental impacts such as acid mines drainage and other toxic effects associated with many of the metal extraction industries.<br>- Waste or un-saleable blocks will be dumped in the demarcated waste dump on a regular basis.<br>- Bury all surplus loose, isolated waste rock and un-saleable blocks in designated sub surface pits | N/A |

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| | and cover with growth medium.<br>- Waste or low-grade blocks can be subjected to secondary processing by cutting into smaller blocks, used as refill or landscaping, crushed for other applications (such as concrete production), or otherwise dealt with responsibly.<br><br>• **Overburden, cover, and/or "soft" material including topsoil**<br>- Stored overburden in the form of boulder rubble and other stone waste should not be left in piles and should be used to cover waste dumps.<br>- Soil removal creates permanent impacts that can be mitigated through restoration of soil cover, although the significance of the impact remains high. This is most apparent in steep rocky slopes where there is thin soil cover of limited areal extent which is seldom removed and stockpiled ahead of mining. However, rocky post-mining slopes can usually be rehabilitated with fine waste rock or tailings to provide the ecological niche provided by the thin patchy lithosoil (rocky soil).<br>- Remove and stockpile 300mm topsoil in berms or heaps less than 1,5m high and turn soil or re-use every six months. Do not use as permanent storm water control feature.<br>- Remove and stockpile topsoil from roads, building platforms and stockpile areas prior to construction for use to restore disturbed areas. To ensure long-term stability, the restored soil cover should attempt to mimic the pre-mining distribution of soil texture and thickness.<br>- Contaminated soil must be treated by first removing the source of contamination - removing the source of contamination should allow the system to recover without further cleanup required.<br>- Petrochemical spillages to be collected in a drip tray and drum to store excavated spill affected soil for disposal at a registered facility or onsite treatment.<br>- The most promising techniques for in on-site treatment involve bioremediation. Bioremediation involves the use of microorganisms to destroy hazardous contaminants.<br><br>• **Other non-specification waste such as sub-economic lower grade ore**<br>- Any product stockpiles left or oversize builders must be removed and used to backfill excavations or to slope remaining high walls.<br>- Waste or low-grade blocks can be subjected to secondary processing by cutting into smaller blocks, used as refill or landscaping, crushed for other applications (such as concrete production), or otherwise dealt with responsibly.<br><br>• **Industrial waste (i.e. including hazardous wastes and oils and greases)**<br>- Distinguished between farming and mining infrastructure and waste in consultation with landowner<br>- Separation of wastes into classes will ensure that waste is disposed of safely and according to the correct procedure. In order to ensure that waste classes are kept in separate streams, communication will be passed on and people will be trained on the different waste classes.<br>- Unwanted steel, sheet metal and equipment needs to be stored in a demarcated salvage yard.<br>- Unwanted steel, sheet metal and equipment in the salvage yard will be sold or disposed of as scrap metal. Recycling and reusing materials may reduce garbage haul fees or generate income through the sale of scrap metal and old equipment.<br>- All steel structures and reinforcing will be discarded or sold as scrap.<br>- All equipment and other items used during the mining operation needs to be removed from the site.<br>- Used oils / hydrocarbons fuels / liquids are to be collected in sealed containers (stored on concrete slabs) and removed from site for recycling by a reputable company.<br>- All waste in the temporary storage area for used lubrication products and other hazardous chemicals will be disposed of at a collection point from where it will be collected by a waste recycling company.<br>- Mobile generators will supply electricity to the machinery. Generator bays will be constructed with the necessary pollution control measures (drip trays).<br>- Clean out content of oil traps and dispose of waste at registered and purpose designed landfill | |

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| | sites.<br>- Hydrocarbon contaminated sludge (collected in oil traps) - Removed from the oil traps and removed from site for recycling (if possible) or disposal at a suitably permitted facility.<br>- All temporary waste storage areas need to be cleaned out and waste removed.<br>- Tyres to be return to supplier or a company that uses old tyres for making door mats, shoes, swings, etc.<br>- Batteries to be return to supplier or dispose at a permitted hazardous waste facility.<br>- Fluorescent tubes to be collected in sealed containers (stored on concrete slabs) and removed from site for disposal at a permitted hazardous waste facility.<br>- Chemical containers to be returned to supplier or disposed of at a legal, permitted facility that is capable of disposing of the waste. (DO NOT sell chemical containers to workers or communities).<br>- Laboratory waste (chemicals) - Returned to supplier or disposed of at a permitted facility that is capable of disposing of the waste.<br>- Industrial chemicals (laboratory waste) - Returned to supplier or disposed of at a permitted facility that is capable of disposing of the waste. These liquid wastes cannot be disposed of on the waste dumps.<br><br>• **Domestic waste (i.e. waste that is generated from the accommodation and offices)**<br>- Domestic waste - Separated at source into recyclable products. These must then be removed and recycled by recognised contractors. (Note that the mine is responsible for the waste from cradle to grave).<br>- Disposal at a registered and officially permitted commercial or municipal landfill site is the most cost-effective option for materials that cannot be recycled.<br>- Domestic waste generated by workers needs to be sorted and all biodegradable waste must be stored in separate drums provided for.<br>- This biodegradable waste will be dumped in a landfill provided for onsite. In addition, a small herd of pigs are being kept at the headquarters to eat the biodegradable waste.<br><br>• **Waste water (i.e. including process water and water from sanitation processes, as well as sewage sludge)**<br>- Equipment used in the mining process will be adequately maintained in the workshops of the company so that during operations it does not spill oil, diesel, fuel, or hydraulic fluid.<br>- By keeping contaminated and clean water separate and establishing controlled runoff washing bays, the flow and end destination of decontamination washing water will be controlled.<br>- A Standard French drain system will be developed for sewage and grey water disposal.<br>- Although erosion and runoff are natural processes it should be managed by maintaining topsoil in any areas not in use and maintaining maximum existing vegetation coverage.<br>- Slow storm water runoff with contoured, low-gradient drains and channels, as well as retention ponds. A series of ponds may also be used to remove sediment and other contaminants from water before reuse or reintroduction into the mining process.<br>- Storm water diversion and erosion control contour berms separate clean and contaminated water systems around the pit and infrastructure areas.<br>- Sewage - No sewage outfall may be located within 100m of a water feature. No sewage may be discharged into a water body.<br>- Ensure that a purification and recycling sewage and effluent management system is installed at the ablution facilities at the Yellow and Cape Spring Quarries. | |
| Residual impacts: | Recycling of waste material creates employment. | N/A |
| Cumulative impact post mitigation: | Medium-Low | N/A |
| Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High) | Medium-Low | N/A |

| **Potential impact and risk:**<br>**Potential Impacts on Visual Landscape** | **IMPACT 6: VISUAL INTRUSION: Caused by the machinery, topsoil and rock stockpiles, cleared areas, and movement of trucks on site. The quarries already exist. The site is however, remote and rural in nature with no receptors (people) as it is located on private property.** | |
|---|---|---|
| **ALTERNATIVE** | **PREFERRED AND ONLY ALTERNATIVE** | **NO-GO ALTERNATIVE** |
| Nature of impact: | Negative | |
| Extent and duration of impact: | Site & Long term | |
| Consequence of impact or risk: | Loss | |
| Probability of occurrence: | Definite | |
| Degree to which the impact may cause irreplaceable loss of resources: | Low | |
| Degree to which the impact can be reversed: | Reversible | |
| Indirect impacts: | The local topography and landscape is already altered due the existing mines. The hills and valleys generally obstruct views of mining areas. | |
| Cumulative impact prior to mitigation: | Medium-High | |
| Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High) | Medium-High | |
| Degree to which the impact can be **avoided**: | Medium | |
| Degree to which the impact can be **managed:** | Medium | |
| Degree to which the impact can be **mitigated**: | Medium | |
| Proposed mitigation: | • The site shall be kept neat and tidy at all times. Equipment must be kept in designated areas and storing/stockpiling shall be kept orderly.<br>• The natural red-brown colour of rock is a result of weathering of the outer 1-2mm of the rock surface, and the natural process can be mimicked by coating the rock surface with ferric chloride (FeC13) available commercially in large quantities, as it is extensively used in sewage treatment. Concentrations of around 40% give the best results and are ideal, as one of the products supplied commercially for sewage treatment is a 43% concentration of contained FeC13. Freshly sprayed areas need several days to dry as rain within the first 24-48 hours after spraying causes much of the ferric chloride to be washed off, requiring that the work be repeated. Due to these factors, it is preferential that spraying of rock surfaces with ferric chloride be conducted during the dry season. However, care must be taken, as experience has shown that where there is excessive dust collection on the rock surfaces, such as is the case with dumps close to haul roads, haematite tends to form around the dust particles rather than on the rock surface, resulting in substantial loss of coverage when the rains wash off the dust. This can be overcome by washing down these surfaces with water several days prior to spraying, or by treating these areas during dry window periods within the rainy season.<br>• Mitigation of the visual impact of “heaped fill dumps” and “sidehill dumps” will include rock shading and limited topsoil application to the slope and revegetation on the top of the dump. | |
| Residual impacts: | Good housekeeping will ensure a neat and well-maintained construction area reducing visual impact. | |
| Cumulative impact post mitigation: | Medium-Low | |
| Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High) | Medium-Low | |

| **Potential impact and risk:** **Potential Impacts on Social, and Biophysical Environments** | **IMPACT 7: EMMISSIONS (DUST, VEHICLES & NOISE): Noise and dust will be created by the cutting of the granite into blocks; from the mining equipment (e.g. front-end loaders) and hauling vehicles that also emit Greenhouse Gases.** | |
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| **ALTERNATIVE** | **PREFERRED AND ONLY ALTERNATIVE** | **NO-GO ALTERNATIVE** |
| Nature of impact: | Negative | N/A |
| Extent and duration of impact: | Site and Long Term | N/A |
| Consequence of impact or risk: | Loss | N/A |
| Probability of occurrence: | Definite | N/A |
| Degree to which the impact may cause irreplaceable loss of resources: | Low | N/A |
| Degree to which the impact can be reversed: | Low | N/A |
| Indirect impacts: | • Carbon emissions from vehicle exhausts have a negative impact on the ozone layer.<br>• Residents outside the project site that reside along the hauling roads would be impacted on by noise, dust and vehicle emissions. | N/A |
| Cumulative impact prior to mitigation: | Medium | N/A |
| Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High) | Medium | N/A |
| Degree to which the impact can be **avoided**: | Medium | N/A |
| Degree to which the impact can be **managed:** | Medium | N/A |
| Degree to which the impact can be **mitigated**: | Medium | N/A |
| Proposed mitigation: | • Health and safety equipment is required for workers.<br>• The wetting of the saws helps reduce dust generation during cutting of the blocks.<br>• No amplified music should be allowed on site.<br>• Existing tracks will be used as haul roads and will only be upgraded to facilitate haul trucks by applying dust suppression and/or hardening compound such as Macadamite.<br>• On public roads the vehicles shall adhere to municipal and provincial traffic regulations including speed limits.<br>• Vehicles used on site for the construction related activities shall be maintained and in a good working condition so as to reduce emissions.<br>• Engines shall be turned off when the vehicle is temporarily parked or stationery for long periods. | N/A |
| Residual impacts: | Dust settling on adjacent vegetation can impact on vegetative growth, which is a short-term impact until the rainfall season. | N/A |
| Cumulative impact post mitigation: | Low | N/A |
| Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High) | Low | |
| **Potential impact and risk:** **Potential Impacts on Heritage, Paleontological and Cultural landscape** | **IMPACT 8: POTENTIAL FOR HERITAGE, PALAEONTOLOGICAL AND CULTURAL IMPACTS:** **The stone walled kraal (D011) should be excluded from quarrying; no further archaeological studies or mitigation is required for the areas examined for this report; and no further palaeontological studies or mitigation is required. Refer to Appendix C**. | |
| **ALTERNATIVE** | **PREFERRED AND ONLY ALTERNATIVE** | **NO-GO ALTERNATIVE** |
| Nature of impact: | Negative for low significant finings; Neutral for potential grave. | N/A |

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| Extent and duration of impact: | Local & Long term | N/A |
| Consequence of impact or risk: | Loss for low significant finings; no loss for potential grave. | N/A |
| Probability of occurrence: | Definite for low significant fining; unlikely for potential grave | N/A |
| Degree to which the impact may cause irreplaceable loss of resources: | No loss (according to Specialist Report). | N/A |
| Degree to which the impact can be reversed: | Irreversible for low significance findings | N/A |
| Indirect impacts: | Loss of context of insignificant findings. | N/A |
| Cumulative impact prior to mitigation: | Low for insignificant findings | N/A |
| Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High) | Low for insignificant findings | N/A |
| Degree to which the impact can be **avoided**: | Very low for insignificant findings | N/A |
| Degree to which the impact can be **managed:** | Very low for insignificant findings | N/A |
| Degree to which the impact can be **mitigated**: | Very low for insignificant findings | N/A |
| Proposed mitigation: | None required for insignificant findings<br>Demarcate the stone walled kraal (D011) as a no-go area. | N/A |
| Residual impacts: | None identified for insignificant findings | N/A |
| Cumulative impact post mitigation: | Low | N/A |
| Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High) | Low | N/A |
| **Potential impact and risk:**<br>**Potential Impacts on Socio-Economic Environment** | **IMPACT 9: CREATION OF EMPLOYMENT & JOB SECURITY DURING OPERATIONAL PHASE WITH LOCAL AND REGIONAL ECONOMIC SPIN-OFFS** | |
| **ALTERNATIVE** | **PREFERRED AND ONLY ALTERNATIVE** | **NO-GO ALTERNATIVE** |
| Nature of impact: | Positive | Negative |
| Extent and duration of impact: | Local, district and Long term | Local, District & Long Term |
| Consequence of impact or risk: | Gain | Loss |
| Probability of occurrence: | Definite | Definite |
| Degree to which the impact may cause irreplaceable loss of resources: | No loss | Medium |
| Degree to which the impact can be reversed: | Irreversible (employment can be lost by an individual due to non-performance but the job provision is irreversible) | Reversible |
| Indirect impacts: | • Upskilling<br>• Local economic spin-offs through increased income earned, and through purchasing of local materials required for the operational activities.<br>• Income generation for landowners in a time of severe drought where livestock farming is not sustainable. | • No upskilling.<br>• No local economic spin-offs due to lack of income earned.<br>• No ongoing supply of granite to international markets.<br>• Opportunity cost for landowner and applicant. |
| Cumulative impact prior to mitigation: | Medium (-) | Medium (-) |
| Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, | Medium (-) | Medium (-) |

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| High, or Very-High) | | |
| Degree to which the impact can be **avoided**: | Very low | Medium |
| Degree to which the impact can be **managed:** | High | Medium |
| Degree to which the impact can be **mitigated**: | High | Medium |
| Proposed mitigation: | • Employment of local previously disadvantaged labour wherever possible, with provision of training (upskilling) | No mitigation possible with No-Go alternative. |
| Residual impacts: | The upliftment of unemployed people, with positive impact on standard of living for their families. Local and regional economic spin-offs from investment through Social Labour Plan. | No job creation or potential for upskilling of previously disadvantaged labour. |
| Cumulative impact post mitigation: | Medium (+) | Medium (-) |
| Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High) | Medium (+) | Medium (-) |

## Table 3: Impact Assessment during Decommissioning and Closure Phase

| **DECOMMISSIONING & CLOSURE PHASE** | | |
|---|---|---|
| **Potential impact and risk:** **Potential Impacts on Biophysical Environment** | **IMPACT 1: REHABILITATION OF MINED AND CLEARED AREAS: As per Rehabilitation, Decommissioning and Mine Closure Plan (Appendix D)** | |
| **ALTERNATIVE** | **ALTERNATIVE 1 (PREFERRED)** | **NO-GO ALTERNATIVE** |
| Nature of impact: | Positive | N/A |
| Extent and duration of impact: | • Local and Long term | N/A |
| Consequence of impact or risk: | Gain | N/A |
| Probability of occurrence: | Definitely | N/A |
| Degree to which the impact may cause irreplaceable loss of resources: | No loss | N/A |
| Degree to which the impact can be reversed: | Reversible | N/A |
| Indirect impacts: | • Ore bodies like granite that lend themselves to open-pit mining are not prone to causing water pollution and therefore water accumulating in the rehabilitated pit can usually be used for a number of purposes. | N/A |
| Cumulative impact prior to mitigation: | Medium | N/A |
| Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High) | Medium | N/A |
| Degree to which the impact can be **avoided**: | Very low (rehabilitation is mandatory) | N/A |
| Degree to which the impact can be **managed:** | High | N/A |
| Degree to which the impact can be **mitigated**: | High | N/A |
| Proposed mitigation: | • Implementation of Final Rehabilitation, Decommissioning and Mine Closure Plan (to be included in EIA Phase).<br>• The focus of topographic rehabilitation may not be obvious at the time of mine planning and must | N/A |

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| | be addressed as the mine develops and the Closure Plan must be reviewed periodically for continued relevance in the light of changed mine path or long-term plans.<br>• Implementation of the tasks detailed under waste management (Operational Phase: Impact 1 above) to manage the risks associated with high wall stability of the quarry and slope stability of the waste dump will ensure a safe post mining landscape without the requirement for long term monitoring and management. Regular inspections and audits will be used as management system to ensure compliance.<br>• At final closure of the operation all remaining product (blocks) from the demarcated stockpile will be restored to pit wherever possible to reduce highwall height and provide surface for rehabilitation or used to fill any remaining deep excavations if any.<br>• Compacted areas shall be scarified after use during decommissioning and rehabilitation.<br>• Any stored topsoil shall be spread over the scarified surface.<br><br>• **Other mitigating with regard to residual environmental impact**<br>- Implementing screening as part of the cleaning activities before materials are moved from the mine.<br>- The infrastructure area will be screened for petrochemical spills and cleaned and waste from the temporary storage facility will be removed and the area cleaned.<br>- The compacted salvage yard, lay down and movement areas will be screened for petrochemical spills and cleaned before it is ripped and levelled.<br>- Redundant structures, buildings and civil foundations (down to one meter below surface for subsurface infrastructure) will be removed for use elsewhere or demolished and discarded.<br>- All redundant infrastructure and services needs to be demolished including ruins, buildings, foundations and footings.<br>- Building rubble will be used as backfill in excavations or removed from site in the absence of excavations.<br>- Remove all power and water supply installations not to be retained by landowner in terms of section 44 of the MPRDA.<br>- Removing underground infrastructure to one meter below surface.<br>- Excavations created by removing subsurface infrastructure needs to be filled, levelled and compacted.<br>- Final walk through of complete mining lease area to ensure no mining related waste and of re-usable infrastructure remain on site.<br>- As part of this phase training of personnel in the implementation of the Closure Plan will done and the implementation of the environmental awareness plan will be an ongoing process. | |
| Residual impacts: | Increase in natural habitat following rehabilitation processes. | N/A |
| Cumulative impact post mitigation: | Very Low | N/A |
| Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High) | Very Low | N/A |
| **Potential impact and risk:**<br>**Potential Impacts on Socio-Economic Environment** | **IMPACT 2: CREATION OF EMPLOYMENT, JOB SECURITY WITH LOCAL AND REGIONAL ECONOMIC SPIN-OFFS DURING DECOMMISSIONING & CLOSURE PHASE** | |
| **ALTERNATIVE** | **PREFERRED AND ONLY ALTERNATIVE** | **NO-GO ALTERNATIVE** |
| Nature of impact: | Positive | Negative |
| Extent and duration of impact: | Local, district and Short term | Local, District & Short Term |
| Consequence of impact or risk: | Gain | Loss |
| Probability of occurrence: | Definite | Definite |

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| Degree to which the impact may cause irreplaceable loss of resources: | No loss | Medium |
| Degree to which the impact can be reversed: | Irreversible (employment can be lost by an individual due to non-performance but the job provision is irreversible) | Reversible |
| Indirect impacts: | • Upskilling.<br>• Local economic spin-offs through increased income earned. | • No upskilling<br>• No local economic spin-offs due to lack of income earned.<br>• Opportunity cost for landowner and applicant. |
| Cumulative impact prior to mitigation: | Medium (-) | Medium (-) |
| Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High) | Low | Medium (-) |
| Degree to which the impact can be **avoided**: | Very low | Medium |
| Degree to which the impact can be **managed:** | High | Medium |
| Degree to which the impact can be **mitigated**: | High | Medium |
| Proposed mitigation: | • Ongoing employment of local previously disadvantaged labour wherever possible, with provision of training (upskilling) | No mitigation possible with No-Go alternative. |
| Residual impacts: | The upliftment of unemployed people, with positive impact on standard of living for their families.<br>Local and regional economic spin-offs from investment through Social Labour Plan. | No job creation or potential for upskilling of previously disadvantaged labour. |
| Cumulative impact post mitigation: | Medium (+) | Medium (-) |
| Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High) | Medium (+) | Medium (-) |