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BASIC ASSESSMENT REPORT & ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

THE PROPOSED MINING PERMIT COMBINED WITH A WASTE LICENCE APPLICATION FOR THE MINING OF STONE AGGREGATE (GRAVEL) AND STONE AGGREGATE (FROM WASTE DUMP) INCLUDING ASSOCIATED INFRASTRUCTURE, STRUCTURE, AND EARTHWORKS ON A CERTAIN 5HA PORTION OF PORTION 90 OF THE FARM ELANDSFONTEIN 34, REGISTRATION DIVISION: IP, NORTH WEST PROVINCE.

| | |
|-------------------|--|
| NAME OF APPLICANT | GCG Crushers CC |
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| REFERENCE NUMBER: | NW30/5/1/3/2/11013MP |

PROJECT INFORMATION

Project Name: Application for an Environmental Authorisation for the proposed Mining Permit combined with a Waste Licence application for the mining of Stone aggregate (Gravel) and Stone Aggregate (From waste dump) including associated infrastructure, structure, and earthworks on a certain 5ha portion of Portion 90 of the farm Elandsfontein 34, Registration Division: IP, North West province.

Report Title: EIR & EMPr

Prepared By: Milnex CC

Date: 04/07/2022

QUALITY CONTROL:

| | Report Author: | Report Reviewer: |
|--------------|--|-------------------------|
| Name: | Lizanne Esterhuizen Honours Degree in Environmental Science | N/A |

Signature:



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The Public Participation Process (PPP) must follow Regulation 41 of NEMA EIA Regulations; thus, the process needs to be transparent. However, due to the Protection of Personal Information Act (POPI Act) which commenced on 01 July 2021, Stakeholders, Landowners, surrounding landowners and registered I&AP' addresses, contact details and comments will not be included in any draft report to be circulated. All this information will form part of the final report to be submitted to the Competent Authority only.

Should you be identified as a Stakeholder, Landowner, Surrounding landowner and you do not wish to receive any further communicate from Milnex CC regarding the application in question, you may request in writing that your details be removed from the Milnex CC database for this application.

IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002 as amended), the Minister must grant a prospecting or mining right if among others the mining “will not result in unacceptable pollution, ecological degradation or damage to the environment”.

Unless an Environmental Authorisation can be granted following the evaluation of an Environmental Impact Assessment and an Environmental Management Programme report in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

In terms of section 16(3)(b) of the EIA Regulations, 2014, any report submitted as part of an application must be prepared in a format that may be determined by the Competent Authority and in terms of section 17 (1) (c) the competent Authority must check whether the application has taken into account any minimum requirements applicable or instructions or guidance provided by the competent authority to the submission of applications.

It is therefore an instruction that the prescribed reports required in respect of applications for an environmental authorisation for listed activities triggered by an application for a right or permit are submitted in the exact format of, and provide all the information required in terms of, this template. Furthermore, please be advised that failure to submit the information required in the format provided in this template will be regarded as a failure to meet the requirements of the Regulation and will lead to the Environmental Authorisation being refused.

It is furthermore an instruction that the Environmental Assessment Practitioner must process and interpret his/her research and analysis and use the findings thereof to compile the information required herein. (Unprocessed supporting information may be attached as appendices). The EAP must ensure that the information required is placed correctly in the relevant sections of the Report, in the order, and under the provided headings as set out below, and ensure that the report is not cluttered with un-interpreted information and that it unambiguously represents the interpretation of the applicant.

BASIC ASSESSMENT REPORT PROCESS

- 1) The environmental outcomes, impacts and residual risks of the proposed activity must be set out in the basic assessment report.

OBJECTIVE OF THE BASIC ASSESSMENT PROCESS

- 2) The objective of the basic assessment process is to, through a consultative process—
 - a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;
 - b) identify the alternatives considered, including the activity, location, and technology alternatives;
 - c) describe the need and desirability of the proposed alternatives[.];
 - d) through the undertaking of an impact and risk assessment process, inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage[], and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on [the] these aspects to determine—
 - i) the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
 - ii) the degree to which these impacts—
 - aa) can be reversed;
 - bb) may cause irreplaceable loss of resources; and
 - cc) can be avoided, managed or mitigated; and
 - e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to—
 - i) identify and motivate a preferred site, activity and technology alternative;
 - ii) identify suitable measures to avoid, manage or mitigate identified impacts; and
 - iii) identify residual risks that need to be managed and monitored.

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SCOPING OF ASSESSMENT AND CONTENT OF BASIC ASSESSMENT REPORT

1) Contact Person and correspondence address

A) DETAILS OF:

i) THE EAP WHO PREPARED THE REPORT

ii) EXPERTISE OF THE EAP

| Name of Practitioner | Qualifications | Contact details |
|----------------------|---|---|
| Lizanne Esterhuizen | Honours Degree in Environmental Science (refer to Appendix 1) | Tel No.: (018) 011 1925 Fax No. : (053) 963 2009 e-mail address: lizanne@milnex-sa.co.za |
| Christiaan Baron | Master's Degree in Environmental Management (M.ENV.MAN) (refer to Appendix 1) | Tel No.: (018) 011 1925 Fax No.: (053) 963 2009 e-mail address: christiaan@milnex-sa.co.za |
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Summary of the EAP's past experience. (Attach the EAP's curriculum vitae as **Appendix 2**)

Milnex CC was contracted by **GCG Crushers CC** as the independent environmental consultant to undertake the BAR and EMPr process for a Mining Permit combined with a Waste Licence application for the mining of Stone aggregate (Gravel) and Stone Aggregate (From waste dump) including associated infrastructure, structure, and earthworks on a certain 5ha portion of Portion 90 of the farm Elandsfontein 34, Registration Division: IP, North West province. The Elandsfontein 34 property is located approximately 4km north of Lichtenburg adjacent the R505 on route to Ottoshoop in the North-West Province. Milnex CC does not have any interest in secondary developments that may arise out of the authorisation of the proposed project.

Milnex CC is a specialist environmental consultancy with extensive experience in the mining industry which provides a holistic environmental management service, including environmental assessment and planning to ensure compliance with relevant environmental legislation. Milnex CC benefits from the pooled resources, diverse skills and experience in the environmental and mining field held by its team that has been actively involved in undertaking environmental studies for a wide variety of mining related projects throughout South Africa. The Milnex CC team has considerable experience in environmental impact assessment and environmental management, especially in the mining industry.

Milnex CC have experience consulting in the environmental field. Their key focus is on environmental assessment, advice and management and ensuring compliance to legislation and guidelines. They are currently involved in undertaking EIAs for several projects across the country (refer to **Appendix 2** for CV)

B) DESCRIPTION OF THE PROPERTY.

| | |
|---|---|
| Farm Name: | 1) A certain 5ha portion of Portion 90 of the farm Elandsfontein 34 |
| Application area (Ha) | 5 hectares |
| Municipalities | Ngaka Modiri Molema District Municipality Ditsobotla Local Municipality |
| Registration Division | IP |
| Distance and direction from nearest town | The property is located approximately 4km north of Lichtenburg adjacent the R505 on route to Ottoshoop. |
| 21 digit Surveyor General Code for each farm portion | 1) TOIP00000000003400090 |
| Minerals applied for | Stone aggregate (Gravel) Stone Aggregate (From waste dump) |
| Locality map | Attach a locality map at a scale not smaller than 1:250000 and attach as Appendix 2 |

III. FARM CO-ORDINATES

| Farm | Longitude | Latitude |
|---|------------------|------------------|
| 1) A certain 5ha portion of Portion 90 of the farm Elandsfontein 34 | 26° 7' 2.721" E | 26° 7' 39.135" S |
| | 26° 6' 54.826" E | 26° 7' 32.372" S |
| | 26° 6' 56.123" E | 26° 7' 41.871" S |
| | 26° 6' 50.197" E | 26° 7' 36.446" S |

C) LOCALITY MAP (show nearest town, scale not smaller than 1:250000 attached as Appendix 3).

A Locality map is attached in Appendix 3 and on figure 1 below.

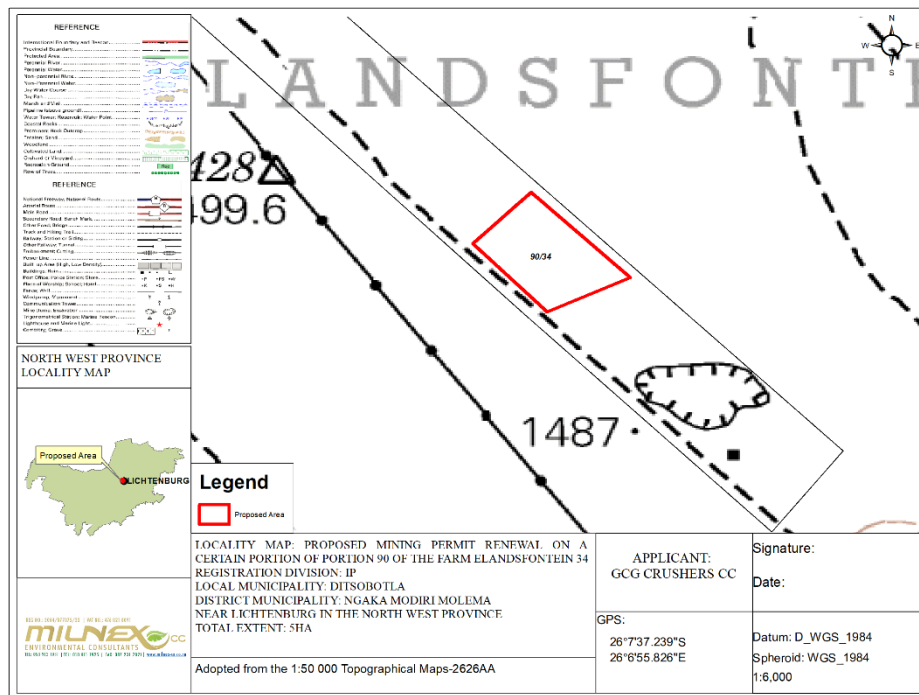


Figure 1: Locality Map

Figure 2: Site Plan Map



D) DESCRIPTION OF THE SCOPE OF THE PROPOSED OVERALL ACTIVITY.

i) LISTED AND SPECIFIED ACTIVITIES

| NAME OF ACTIVITY (E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc E.g. for mining,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.) | Aerial extent of the Activity Ha or m² | LISTED ACTIVITY (Mark with an X where applicable or affected). | APPLICABLE LISTING NOTICE (GNR 544, GNR 545 or GNR 546) | WASTE MANAGEMENT AUTHORISATION (Indicate whether an authorisation is required in terms of the Waste Management Act). (Mark with an X) |
|--|---|---|---|---|
| Mining permit: Listing Notice 1 (GNR 327) as amended (GNR 517), Activity 21: <i>“Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity as contained in this Listing Notice on in Listing Notice 3 of 2014, required to exercise the mining permit”</i> | The application area is 5ha | X | Listing Notice 1 (GNR 327) as amended (GNR 517), Activity 21 | - |
| Clearance of indigenous vegetation: Listing Notice 1 (GNR 327), Activity 27: <i>"The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation."</i> | The application area is 5ha | X | Listing Notice 1 (GNR 327), Activity 27 | - |
| Listing Notice 3 (GNR 324), Activity 4: <i>“The development of a road wider than 4 metres with a reserve less than 13,5 metres. (h): North West: (iv) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority; (vi) Areas within 5 kilometres from protected areas identified in terms of NEMPAA or from a biosphere reserve.</i> | The application area is 5ha | X | Listing Notice 3 (GNR 324), Activity 4 (h)(iv)(vi) | - |
| Clearance of vegetation: Listing Notice 3 (GNR 324), Activity 12: <i>The clearance of an area of 300 square metres or more of indigenous vegetation (h) North West: (iv) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority;</i> | The application area is 5ha | X | Listing Notice 3 (GNR 324), Activity 12 (h)(iv) | - |

| | | | | |
|--|-----------------------------|--|--|----------|
| NEM:WA 59 of 2008: Residue stockpiles or residue deposits, Category A: (15): The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a prospecting right or mining permit, in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002). | The application area is 5ha | | NEM:WA 59 of 2008: Residue stockpiles or residue deposits, Category A: (15) | X |
|--|-----------------------------|--|--|----------|

ii) DESCRIPTION OF THE ASSOCIATED STRUCTURES AND INFRASTRUCTURE RELATED TO THE DEVELOPMENT

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

GCG Crushers CC has embarked on a process for applying for a Mining Permit for the Mining of Stone aggregate (Gravel) and Stone Aggregate (From waste dump) including associated infrastructure, structure, and earthworks on a certain 5ha portion of Portion 90 of the farm Elandsfontein 34, Registration Division: IP, North West province. These portions are preferred due to the sites expected mineral resources. **GCG Crushers CC** requires a Mining Permit in terms of NEMA and the Mineral and Petroleum Resources Development Act to mining for minerals mentioned above within the Ditsobotla Local Municipality, North West Province (refer to a locality map attached in **Appendix 3**).

Access roads

Access will be obtained from existing gravel roads off the R503.

Water Supply

Additional water requirements related to the portable water supply for employees and workers will be supplied.

Water uses

If water uses under section 21 a-k of the NWA are triggered, a Water Use Licence Application (WULA) will need to be lodged with the department of Water & Sanitation (DWS).

Dust suppression

Unacceptable levels of dust fallout can be determined by implementing dust management by monitoring compliance with the requirements of the National Dust Control Regulations for an activity, in terms of nuisance or disturbance.

The National Framework for Air Quality Management in the Republic of South Africa (the National Framework), as published under Government Notice No. 1144 of 26 October 2018, underpins NEM:AQA by providing national norms and standards for air quality management to ensure compliance with legislation. The National Framework serves as the country's AQMP.

Section 32 of the NEM:AQA makes provision for the Minister or the MEC to prescribe measures for the control of dust in specific places or areas, or by specified machinery or in specific instances. While dust generally does not pose a health risk, it may be regarded as a nuisance. It is the responsibility of the owner of the dust generating activity to take reasonable measures to limit the nuisance factor.

With respect to this, the Minister has published in the gazette the regulations for the control of dust in 2013 (Notice 827, Government Gazette No. 36974). These regulations provide requirements for measures for the control of dust, which includes the requirements for monitoring, dust management plan development and implementation and reporting.

Section 3. Dustfall standard

Table 1. Acceptable dust falls rates

| Restriction Areas | Dust falls rate (D) (mg/m ² /day, 30-day average) | Permitted frequency of exceeding dust fall rate |
|----------------------|--|---|
| Residential Area | D < 600 | Two within a year, not sequential months |
| Non-residential Area | 600 < D < 1200 | Two within a year, not sequential months |

Ablution

Chemical toilets shall be used, no french drains and pits shall be permitted.

Storage of dangerous goods

During the mining activities, limited quantities of diesel and fuel, oil and lubricants if any will be stored on site. These goods should be placed in a bunded area one and a half times the volume of the total amount of goods to be stored. Less than 30 cubic metres of dangerous good will be stored on site.

(i) **DESCRIPTION OF PLANNED NON-INVASIVE ACTIVITIES:**

(These activities do not disturb the land where mining will take place e.g. aerial photography, desktop studies, aeromagnetic surveys, etc.).

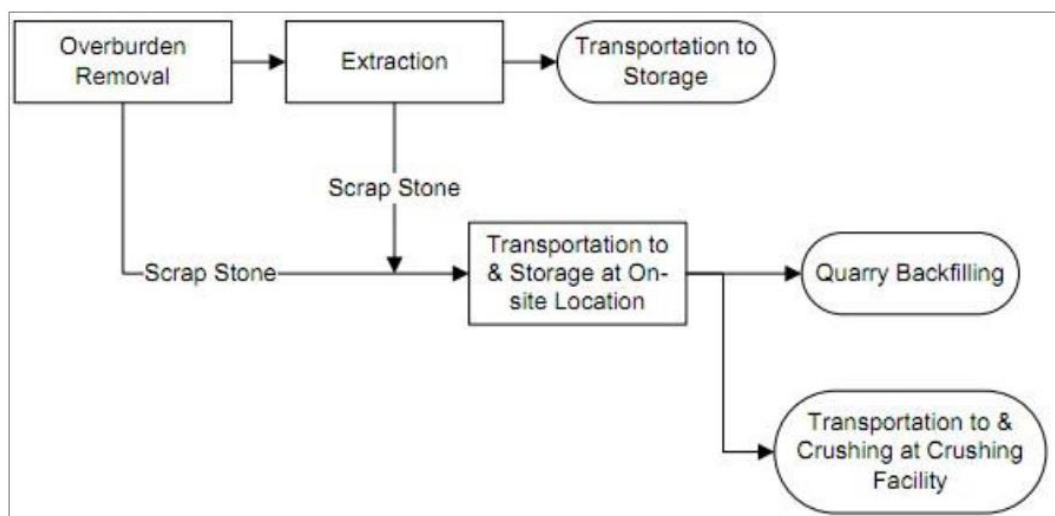
Not applicable

(ii) **DESCRIPTION OF PLANNED INVASIVE ACTIVITIES:**

(These activities result in land disturbances e.g. sampling, drilling, bulk sampling, etc.)

The stone aggregate mining methodology in the open pit environment will be:

- The clearance of vegetation (If not already cleared)
- Stripping and stockpiling of topsoil for future rehabilitation (If topsoil exists)
- Blasting of rock
- Material blasted will be removed from the pit with an excavator. The material will be loaded onto dumper trucks from where it will be moved to the crusher.
- The gravel will be stockpiled and fed into the crusher.
- In the pilot crusher the material will be crushed from 800mm to approximately 50mm.
- It will be screened into 50 mm material and crusher dust.
- The material not screened will again be crushed by a cone crusher.
- This will mainly be 50mm material which will be crushed to less than 20mm material.
- The plant will be used for road building material.
- The material will be screened in 19.2mm, 13.2mm, 9.5mm, 6.7mm and crusher dust.
- In relation to the sand operation, the sand will be removed by an excavator and stockpiled.
- Rehabilitation will follow.



Rehabilitation activities will be:

- The quarry area will not be rehabilitated completely as backfilling will not be possible.
- The pit edges will be sloped with any waste rock and unused overburden to a safe gradient.
- Slopes that have overburden coverage will be revegetated.
- Any remaining unusable waste rocks and overburden (if any) will be placed into the pit to partly fill voids.

E) POLICY AND LEGISLATIVE CONTEXT

| Title of legislation, policy or guideline: | Administering authority: | Promulgation Date: |
|---|--|--------------------|
| National Environmental Management Act No. 107 of 1998 as amended. | Department of Environmental Affairs | 27 November 1998 |
| Constitution of South Africa Act 108 of 1996 | National | 18 December 1996 |
| The National Heritage Resources Act (Act No. 25 of 1999) | SAHRA | 1999 |
| Mineral and Petroleum Resources Development Act (Act No. 28 of 2002) | Department of Mineral Resources & Energy (DMRE) | 2002 |
| Mineral and Petroleum Resources Development Regulations, 2014. | Department of Mineral Resources & Energy (DMRE) | |
| National Infrastructure Plan | National | |
| National Environmental Management: Biodiversity Act No. 10 of 2004 | Department of Environmental Affairs | 7 June 2004 |
| National Environmental Management Waste Act, 2008 (Act No. 59 of 2008) | National & Provincial | 1 July 2009 |
| National Environmental Management: Waste Act, 2008 (Act No. 59 Of 2008). Regulations regarding the Planning & Management of Residue Stockpiles & Residue Deposits from a Prospecting, Mining, Exploration or Production Operation | | |
| EIA regulations under NEMA | Department of Environmental Affairs | 14 December 2014 |
| Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) | Department of Agriculture Forestry and Fisheries | 1 June 1984 |
| National Environmental Management Air Quality Act, 2004 (Act No. 39 of 2004). | National and Provincial | 11 September 2004 |
| National Water Act, 1998 (Act No. 36 of 1998). | National | 20 August 1998 |
| National Forest Act (Act 84 of 1998) (NFA) | National | 30 October 1998 |
| National Veld & Forest Fires Act (Act 101 of 1998) | National | 27 November 1998 |
| National Environmental Management: Protected Areas Act 57 of 2003 | | |
| Hazardous Substances Act (No. 15 of 1979) | | |
| Subdivision of Agricultural Land Act (No. 70 of 1970) | | |
| Occupational Health and Safety Act (No. 85 of 1993) | | |
| Mine Health and Safety Act (No. 29 of 1996) | | |
| Government Notice Regulation 704 of 1999 | | |
| Ngaka Modiri Molema District Municipality Integrated Development Plan (IDP) | Municipal | |
| Ditsobotla Local Municipality Integrated Development Plan (IDP) | Municipal | |

POLICY AND LEGISLATIVE CONTEXT

| Title of legislation, policy or guideline: | Reference where applied | How does this development comply with and respond to the legislation and policy context. |
|--|--|--|
| Constitution of South Africa Act 108 of 1996 | Section 24 | <p>The Constitution is the supreme law of the Republic and all law and conduct must be consistent with the Constitution. The Chapter on the Bill of Rights contains a number of provisions, which are relevant to securing the protection of the environment. Section 24 of the Constitution of the Republic of South Africa (Act 108 of 1996) states the following:</p> <p><i>“Everyone has the right –</i></p> <p><i>(a) to an environment that is not harmful to their health or well-being; and</i></p> <p><i>(b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that –</i></p> <p><i>i) prevent pollution and ecological degradation;</i></p> <p><i>ii) promote conservation; and</i></p> <p><i>iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.”</i></p> <p>The Constitution therefore, compels government to give effect to the people’s environmental right and places government under a legal duty to act as a responsible custodian of the country’s environment. It compels government to pass legislation and use other measures to protect the environment, to prevent pollution and ecological degradation, promote conservation and secure sustainable development.</p> |
| National Environmental Management Act No. 107 of 1998 as amended. | S24(1) of NEMA S28(1) of NEMA | <p>NEMA provides for co-operative governance by establishing principles and procedures for decision-makers on matters affecting the environment. An important function of the Act is to serve as an enabling Act for the promulgation of legislation to effectively address integrated environmental management. Some of the principles in the Act are accountability; affordability; cradle to grave management; equity; integration; open information; polluter pays; subsidiary; waste avoidance and minimisation; co-operative governance; sustainable development; and environmental protection and justice.</p> <p>The mandate for EIA lays with the National Environmental Management Act (107 of 1998) and the EIA Regulations No. 326, 327, 325, and 324 promulgated in terms of Section 24 of NEMA. The EIA Regulations determine that an Environmental Authorisation is required for certain listed activities, which might have a detrimental effect on the environment.</p> |
| EIA regulations as amended under NEMA | Listing notice 1 Listing notice 2 Listing Notice 3 | <p>The National Environmental Management Act 107 of 1998 (NEMA), as amended, makes provision for the identification and assessment of activities that are potentially detrimental to the environment. These activities are detailed in Listing Notice 1 (as amended by GNR 327 of 7 April 2017), Listing Notice 2 (as amended by GNR325 of 7 April 2017) and Listing Notice 3 (as amended by GNR324 of 7 April 2017). Undertaking activities specified in the Listing Notices are only allowed once Environmental Authorisation has been obtained from the competent authority. Such Environmental Authorisation will only be considered once there has been compliance with the EIA Regulations, 2014. The Environmental Authorisation which may be granted subject to conditions.</p> |
| Mineral and Petroleum Resources Development Act (Act No. 28 of 2002) | Section 10, 16, 22, 27 and 48 | <p>The Minerals and Petroleum Resources Development Act identifies the state as the official custodian of South Africa’s Mineral and Petroleum Resources. Therefore, all activities relating to the reconnaissance, prospecting rights, mining rights, mining permits and retention permits are regulated by the State. One of the objectives of the Act is to give effect to section 24 of the Constitution by ensuring that the nation’s mineral and petroleum resources are developed in an orderly and ecologically sustainable manner while promoting justifiable social and economic development.</p> |
| Mineral and Petroleum Resources Development Regulations, 2014. | Regulations 3, 5, 10 and 14 | <p>MPRDA Regulations prescribe how an application for a permit or right must be lodged.</p> |

| | | |
|---|--|--|
| The National Heritage Resources Act (Act No. 25 of 1999) | Section 35 Section 38 | The National Heritage Resources Act (Act No 25 of 1999, Section 35) protects South Africa's unique and non-renewable archaeological and palaeontological heritage sites. These sites may not be disturbed without a permit from the relevant heritage resources authority. Section 38 of the NHRA provides guidelines for Cultural Resources Management and proposed developments: |
| National Environmental Management Waste Act, 2008 (Act No. 59 of 2008) | Category A Category B Category C | <p>Section 24S of NEMA deals with the management of residue stockpiles and residue deposits and provides that Residue stockpiles and residue deposits must be deposited and managed in accordance with the provisions of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), on any site demarcated for that purpose in the environmental management plan or environmental management programme in question.</p> <p>The management of residue stockpiles and residue deposits must be done in accordance with any conditions set out and any identified measures in the environmental authorisation issued in terms of NEMA, an environmental management programme and a waste management licence issued in terms of NEMA (Regulation 3(2)).</p> <p>The National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEM:WA) regulates waste management in all aspects and created a list of waste management activities that have, or are likely to have, a detrimental effect on the environment, which requires an impact assessment and licensing process. Activities listed in Category A require a Basic Assessment process, activities listed in Category B require a Scoping and EIA process and activities under Category C must comply with the relevant requirements or standards, in order for competent authorities to consider an application in terms of NEM:WA.</p> |
| National Environmental Management: Biodiversity Act No. 10 of 2004 | Chapter 4 Chapter 5 | <p>The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) is part of a suite of legislation falling under NEMA. The Act provides for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998; the protection of species and ecosystems that warrant protection; the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources; the establishment and functions of a South African National Biodiversity Institute; and for matters connected therewith (SANBI).</p> <p>Chapter 4 of NEMBA deals with threatened and protected ecosystems and species to ensure the maintenance of their ecological integrity, their survival in the wild, the utilisation of biodiversity is managed in an ecologically sustainable way and to regulate international trade in specimens of endangered species. Chapter 5 of NEMA deals with species and organisms posing potential threats to biodiversity. The purpose of this chapter is to prevent the introduction and spread of alien species and invasive species, also to manage, control and eradicate alien species and invasive species</p> |
| National Environmental Management Air Quality Act, 2004 (Act No. 39 of 2004). | Section 21 | <p>The object of this Act is to protect the environment by providing reasonable measures for the protection and enhancement of the quality of air in the Republic; the prevention of air pollution and ecological degradation; and securing ecologically sustainable development while promoting justifiable economic and social development.</p> <p>Regulations No. R248 (of 31 March 2010) promulgated in terms of Section 21(1) (a) of the National Environmental Management Act: Air Quality Act (39 of 2004) determine that an Atmospheric Emission License (AEL) is required for certain listed activities, which result in atmospheric emissions which have or may have a detrimental effect on the environment. The Regulation also sets out the minimum emission standards for the listed activities. It is not envisaged that an Atmospheric Emission License will be required for the proposed development.</p> |
| National Water Act, 1998 (Act No. 36 of 1998). | Section 21 | <p>Sustainability and equity are identified as central guiding principles in the protection, use, development, conservation, management and control of water resources. The intention of the Act is to promote the equitable access to water and the sustainable use of water, redress past racial and gender discrimination, and facilitate economic and social development. The Act provides the rights of access to basic water supply and sanitation, and environmentally, it provides for the protection of aquatic and associated ecosystems, the reduction and prevention of pollution and degradation of water resources.</p> <p>As this Act is founded on the principle that National Government has overall responsibility for and authority over water resource management, including the equitable allocation and beneficial use of water in the public interest, a person can only be entitled to use water if the use is permissible under the Act. Chapter 4 of the Act lays the basis for regulating water use.</p> |

| | | |
|---|----------------------------|--|
| National Forest Act (Act 84 of 1998) (NFA) | Regulation 7 | <p>The protection, sustainable management and use of forests and trees within South Africa are provided for under the National Forests Act (Act 84 of 1998).</p> <p>Regulation 7 from the Act states the following:</p> <p>Prohibition on destruction of trees in natural forests.</p> <p>(1) No person may -</p> <p>(a) cut, disturb, damage or destroy any indigenous tree in a natural forest; or</p> <p>(b) possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any tree, or any forest product derived from a tree contemplated in paragraph (a), except in terms of-</p> <p>(i) a licence issued under subsection (4) or section 23; or</p> <p>(ii) an exemption from the provisions of this subsection published by the Minister in the Gazette on the advice of the Council.</p> <p>The proposed project would not entail any activities to which the Act applies.</p> |
| National Veld & Forest Fires Act (Act 101 of 1998) | Regulation 13 Chapter 5 | <p>The purpose of the Act is to prevent and combat veld, forest and mountain fires throughout the Republic and provides for a variety of institutions, methods and practices for achieving the purpose. Regulations 13 provides the requirement for firebreaks. Chapter 5 places a duty on all owners to acquire equipment and have available personnel to fight fires.</p> |
| Conservation of Agricultural Resources Act (Act No. 85 of 1983) | | <p>The purpose of the Act is to provide for control over the utilization of the natural agricultural resources of the Republic in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants; and for matters connected therewith.</p> <p>The objects of this Act are to provide for the conservation of the natural agricultural resources of the Republic by the maintenance of the production potential of land, by the combating and prevention of erosion and weakening or destruction of the water sources, and by the protection of the vegetation and the combating of weeds and invader plants.</p> |
| National Infrastructure Plan | | <p>The National Government adopted a National Infrastructure Plan in 2012. With the plan they aim to transform the South African economic landscape while simultaneously creating significant numbers of new jobs, and strengthening the delivery of basic services.</p> <p>Government will over the three years from 2013/14 invest R827 billion in building and upgrading existing infrastructure.</p> <p>These investments will improve access by South Africans to healthcare facilities, schools, water, sanitation, housing and electrification. On the other hand, investments in the construction of ports, roads, railway systems, electricity plants, hospitals, schools and dams will contribute to faster economic growth.</p> <p>This mining activity will indirectly contribute to the growing of the South African economy by supplying SANRAL with material to build and upgrade road infrastructure.</p> |
| North West Province Growth and Development Strategy | | <p>The North West Provincial Growth and Development Strategy provides a framework for integrated and sustainable growth and economic development for the province and its people over the next ten years. It addresses the formulation of a common vision, goals and objectives of what should be achieved and how the provincial government and its social partners should achieve its objectives. The Strategy establishes the foundation blocks from where the Provincial Programme of Action is negotiated in partnership with a variety of stakeholders in the province. It forms the benchmark from which progress and achievements are monitored and evaluated.</p> |

| | | |
|---|--|---|
| District Municipality Integrated Development Plan (IDP) | | The IDP and SDFs of the relevant municipalities was examined and relevant information was included in the EIA report. |
| Local Municipality Integrated Development Plan (IDP) | | The IDP and SDFs of the relevant municipalities was examined and relevant information was included in the EIA report. |

F) NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES.

(Motivate the need and desirability of the proposed development including the need and desirability of the activity in the context of the preferred location).

Aggregates represent about 98% of quarry output, most of which is used in road construction, maintenance and repair. Much of this goes to the production of asphalt, the remainder is used 'dry' without the addition of other materials to provide a sturdy base for roads. Some of the asphalt is processed in the area at or near the quarry, the rest is processed at remote plants. Only the harder more resilient rocks such as the Silurian andesite lavas from Moon's Hill can be employed for most road surfacing requirements. The harder Carboniferous Limestone aggregates are generally used in the lower layers of roads and in footpaths, car parks etc. but polish too readily (and hence have low resistance to skidding) to be used for road surfacing.

Apart from road usage, substantial amounts are mixed (coarse gravel sized stone with finer stone particles or sand) with cement and water to make concrete. This may be carried out at the quarry or materials supplied to truck-mixers (for mixing en-route) or to remote plants. An important local 'downstream' industry is that of concrete product (blocks, pipes, kerbs, pavers, etc) with operations for example at Callow Rock, Mells, Torr Works, Holcombe, Wells and Cheddar. Not only do these produce 'added value' to the raw aggregate, they often make use of 'fines' which are a by-product of general aggregate processing, and without this market would often have to be dumped.

G) MOTIVATION FOR THE PREFERRED DEVELOPMENT FOOTPRINT WITHIN THE APPROVED SITE INCLUDING A FULL DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED DEVELOPMENT FOOTPRINT WITHIN THE APPROVED SITE.

NB!! – This section is about the determination of the specific site layout and the location of infrastructure and activities on site, having taken into consideration the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout.

Location of the site

The location of the site is preferred due to its shallow stone deposits and the close proximity to the town of Lichtenburg in the North West Province.. Access will be obtained from existing gravel roads of the R503.

There is existing exiting mine and processing plant on a certain portion of Portion 90 of the farm Elandsfontein 34 to mine the same mineral.

Preferred activity

The mining of Stone Aggregate is the optimum preferred activities for the site. The shallow stone deposits makes the site ideal for opencast stone aggregate mining. The mine will provide significantly more job opportunities than what is providing currently.

The proposed 5ha can be used for livestock grazing but it is not being utilized.

Technology alternatives

In terms of the technologies proposed, these have been chosen based on the long term success of their mining & prospecting history.

The preferred technology for the proposed mining activity, will be to drill and blast the rock bed and then depositing the material, using an excavator, to the crusher. A jaw- and standard cone crusher will be used for the purpose of crushing the material to adequate sizes required.

When it comes to dust suppression two main methods were considered, namely molasses stillage and the wetting (water) of roads. The table below provides a short summary of the advantages and disadvantages of each.

| Water | Molasses stillage |
|---|---|
| More cost effective | Much more expensive |
| Could lead to the depleting of water resources | Requires less water |
| No damage (only if used excessively) | The product may be toxic to aquatic organisms. (As this product could have physical effects on aquatic organisms for e.g. floating, osmotic damage) |
| No harm to humans or animals (Only a high quantity will have harm to humans or animals) | Not Hazardous or toxic. Could cause irritation to eyes, skin or when ingested and inhaled. |
| Non-flammable | Non-flammable |
| Eye-wash fountains not needed | Eye-wash fountains in the work place are strongly recommended |
| | Working procedures should be designed to minimize worker exposure to this product. |
| Basic storing methods | Storing methods are a bit more complicated. Should be stored in a plastic, plastic lined or stainless steel, tight closed containers between 5 and 40 degrees Centigrade. |

Considering the above mentioned information, water will be used for dust suppression purposes.

H) A FULL DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED DEVELOPMENT FOOTPRINT WITHIN THE APPROVED SITE, INCLUDING:

i) DETAILS OF THE DEVELOPMENT FOOTPRINT ALTERNATIVES CONSIDERED;

- **Consideration of alternatives**

The DEAT 2006 guidelines on 'assessment of alternatives and impacts' proposes the consideration of four types of alternatives namely, the no-go, site, activity, and technology alternatives. It is however, important to note that the regulation and guidelines specifically state that only 'feasible' and 'reasonable' alternatives should be explored. It also recognizes that the consideration of alternatives is an iterative process of feedback between the developer, the EAP and Interested and affected parties, which in some instances culminates in a single preferred project proposal. The following sections explore each type of alternative in relation to the proposed activity.

- **Location alternatives**

This alternative asks the question, if there is not, from an environmental perspective, a more suitable location for the proposed activity. From a local perspective, Portion 90 of the farm Elandsfontein is preferred due to the sites underlying geology and the shallowness of the rock bed to the surface as well as site access, the site has also previously been mined, making it optimum from an environmental perspective.

The proposed development falls within an area used mining purposes and the site is therefore considered to have limited environmental sensitivity as a result. The proposed 5ha area is not used for any agriculture related activities.

- **Activity alternatives**

The basic assessment process also needs to consider if the development of a Stone aggregates mine would be the most appropriate land use for the particular site.

There is an existing mine and a processing plant on a certain portion of Portion 90 of the farm Elandsfontein 34 to mine for Stone aggregate. From the surface and desktop assessment there are no indications that there are other commodities to be mined on the site, except stone aggregate.

Since the proposed area is not used for agriculture related activities, if the proposed mining permit is not granted the proposed area will still not be used for any other activities.

- **Design and layout alternatives**

There is an existing processing plant on a certain portion of Portion 90 of the farm Elandsfontein 34. The mined material from the proposed 5ha area will be transported to the processing plant. Any waste rock will be transported back to the proposed 5ha area to be used rehabilitation.

- **Operational alternatives**

Due to the nature of the mining activities, no permanent services in terms of water supply, electricity, or sewerage services are required.

The facility will be operational from 6 A.M. to 6 P.M., Monday to Friday, but working hours may extend to 7 P.M. and Saturdays. It is however possible that the lifetime of the project can be prolonged by a year or two and that the facility can become operational for prolonged hours or over weekends, depending on the resource.

- **No-go alternative**

This alternative considers the option of 'do nothing' and maintaining the status quo. The description provided in section H of this report could be considered the baseline conditions (status quo) to persist should the no-go alternative be preferred. Should the proposed activity not proceed, the site will remain unchanged

ii) **DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED**

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

Disclaimer:

The Public Participation Process (PPP) must follow Regulation 41 of NEMA EIA Regulations; thus, the process needs to be transparent. However, due to the Protection of Personal Information Act (POPI Act) which commenced on 01 July 2021, Stakeholders, Landowners, surrounding landowners and registered I&AP' addresses, contact details and comments will not be included in any draft report to be circulated. All this information will form part of the final report to be submitted to the Competent Authority only.

Should you be identified as a Stakeholder, Landowner, Surrounding landowner and you do not wish to receive any further communique from Milnex CC regarding the application in question, you may request in writing that your details be removed from the Milnex CC database for this application.

NEWSPAPER ADVERTISEMENT

An advertisement will be placed in English in the local newspaper (**NOORDWESTER**) notifying the public of the EIA process and requesting Interested and Affected Parties (I&APs) to register with, and submit their comments to Milnex CC. I&APs were given the opportunity to raise comments within 30 days of the advertisement.

SITE NOTICES

Site notices was placed (as anticipated on the coordinates below) on site in English to inform surrounding communities and immediately adjacent landowners of the proposed development. I&APs will be given the opportunity to raise comments. Photographic evidence of the site notices will be included in **Appendix 6**. Below are the coordinates where the site notices were placed.

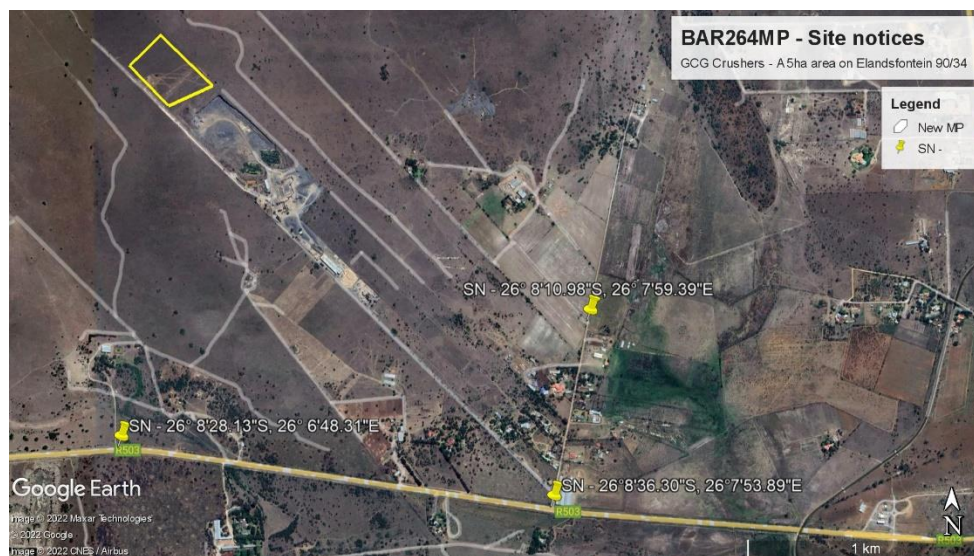


Figure 3: Site notices

DIRECT NOTIFICATION AND CIRCULATION OF BASIC ASSESSMENT REPORT TO IDENTIFIED LANDOWNERS, SURROUNDING LANDOWNERS, OCCUPIERS AND STAKEHOLDERS.

Identified I&APs, including key Stakeholders representing various sectors, Landowners, Surrounding landowners and Occupiers are directly informed of the proposed development and the availability of the **Basic Assessment Report** via registered post or email on **03 May 2022** and were requested to submit comments by **02 June 2022**. A copy of the report was also available at the Milnex offices in Schweizer-Reneke, 4 Botha Street, Schweizer-Reneke and Potchefstroom (Waterberry Street, Waterberry Square, 1st floor, Office 5B, Potchefstroom), between 7:30AM and 5PM, Monday to Friday. For a complete list of stakeholder details and for proof of registered post see **Appendix 6**.

It is expected from I&APs to provide their inputs and comments within 30 days after receipt of the notification or Basic Assessment Report. When the comment period ends, all comments received will be included in the final Basic Assessment Report & EMP Report.

Table 1: List of Stakeholders, Landowners, & surrounding landowners

| Stakeholders |
|--|
| Department of Economic Development, Environment, Conservation & Tourism (DEDECT) |
| Department of Water & Sanitation (DWS) |
| Department of Agriculture, Forestry & Fisheries (DAFF) |
| Provincial Heritage Resources Agency (PHRA) North West |
| Department of Public Works and Roads (DPWR) |
| Department of Mineral Resources & Energy (DMRE) |
| Department of Agriculture & Rural Development (DARD) |
| Department of Environment, Forestry & Fisheries (DEFF) |
| Department: Cooperative Governance and Traditional Affairs (DCGTA) |
| Department of Human Settlements (DHS) |
| Ngaka Modiri Molema District Municipality |
| WESSA |
| Municipal Manager at the Ditsobotla Local Municipality |
| Ward 6 Councillor at the Ditsobotla Local Municipality |
| Landowners |
| Gerhardus Cornelius Grobler |
| Surrounding Landowner |
| Gerhardus Cornelius Grobler |
| Benjiworx (Pty) Ltd |

| Stakeholders |
|---------------------------------------|
| Mokone Matshediso Abiel |
| Trippel A Boerdery CC |
| Catharina Joachomina Elizabeth Venter |
| Daniel Wybrand Wondergem |

MEETINGS

Please note that the Stakeholders & Interested and Affected Parties were informed about the proposed project with the use of press advertisement and registered letters. It was mentioned that due to COVID-19, any meetings will be conducted virtually via Zoom or Microsoft Teams upon request by the I&APs.

No meeting was request by I&APs.

LANDOWNER CONSULTATION

Landowner consent letter was signed, please see **Appendix 11**.

ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Comments received were included in the comments and response table/form (See **Appendix 6** for comments and response form).

iii) **SUMMARY OF ISSUES RAISED BY I&APS**

(Complete the table summarising comments and issues raised, and reaction to those responses)

| Interested and Affected Parties | | Issues raised | EAPs response to issues as mandated by the applicant | Section and paragraph reference in this report where the issue and or response where incorporated |
|--|---|----------------------|--|---|
| List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted. | | | | |
| Organisation | Contact person | | | |
| Landowner | | | | |
| Elandsfontein 90/34 | Gerhardus Cornelius Grobler | No comments received | | |
| Surrounding Landowners | | | | |
| Elandsfontein 90/34 | Gerhardus Cornelius Grobler | No comments received | | |
| Elandsfontein 7/34 | Benjiworx (Pty) Ltd | No comments received | | |
| Elandsfontein 24/34 | Mokone Matshediso Abiel | No comments received | | |
| Elandsfontein RE/28/34, 69/34 & 68/34 | Trippel A Boerdery CC | No comments received | | |
| Elandsfontein RE/26/34 | Catharina Joachomina Elizabeth Venter | No comments received | | |
| Elandsfontein RE/25/34 | Daniel Wybrand Wondergem | No comments received | | |
| Elandsfontein RE/27/34 | G.C. Grobler Eiendomme (Pty) Ltd | No comments received | | |
| The Municipality in which jurisdiction the development is located | | | | |
| Ditsobotla Local Municipality | Municipal Manager: To whom it may concern | No comments received | | |
| Municipal councilor of the ward in which the site is located | | | | |
| Ditsobotla Local Municipality | Ward 6 Councillor Mr Pretorius Jan Wilhelm | No comments received | | |
| Organs of state having jurisdiction | | | | |
| Department of Economic Development, Environment, Conservation & Tourism (DEDECT) | Ouma Skosana | No comments received | | |

| | | | | |
|---|---|---|---|-----------------|
| Department of Water & Sanitation (DWS) | To whom it may concern | No comments received | | |
| | Mr Khutjo Kwena Sekwaila (WUL Manager) | No comments received | | |
| Department of Agriculture, Forestry & Fisheries (DAFF) | Mr. Maurice Vukeya & Mrs Mpho Gumula | No comments received | | |
| Provincial Heritage Resources Agency (PHRA) North West | Mr. Motlhabane Mosiane | No comments received | | |
| Department of Public Works and Roads (DPWR) | To whom it may concern | No comments received | | |
| Department of Mineral Resources & Energy (DMRE) | Me. Ntanganedzeni Mushome | Email received on 08/02/2022 with the acknowledgement letter attached. | Email sent on 08/02/2022 with Public Participation Plan attached. | Appendix 6(iii) |
| | | Received the Acceptance letter date 07/02/2022, only on 14/04/2022. | Email sent on 25/04/2022 with letter attached requesting timeframe extension. | |
| | | Email received on 26/04/2022 grants the timeframe extension request. | Resent the email with the letter request timeframe extension on 26/04/2022 as the previous email was not delivered. | |
| Department of Agriculture & Rural Development (DARD) | Head of Department: Mr Dipepeneneng Serage | No comments received | | |
| Department of Environment, Forestry & Fisheries (DEFF) | To whom it may concern | No comments received | | |
| Department: Cooperative Governance and Traditional Affairs (DCGTA) | Head of Department: Mr James Keatlegile Mashego | No comments received | | |
| Department of Human Settlements (DHS) | Head of Department: Mr JK Mashego | No comments received | | |
| Department of Rural Development and Land reform: Land Claims Commission | Agnes Montwedi | Email received on 13/05/2022 with letter attached. The letter states the following: The Department confirms there is an existing land claim against the farm Elandsfontein. The claim was lodged under Ditsobotla Local Municipality withing the Ngaka Modiri Molema District. The information reflects on the database of claims lodged between 1 July 2014 and 27 July 2016 in terms of the Restitution of Land Rights Amendment Act, of 2014. | Email sent 31/01/2022 is proof of land claims enquiry. | Appendix 6(iii) |

| Other– | | | | |
|---|--|----------------------|--|--|
| Ngaka Modiri Molema District Municipality | Municipal Manager: To whom it may concern | No comments received | | |
| WESSA (National Office) | John Wesson | No comments received | | |

iv) THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE SITES

Baseline Environment

The baseline environment is described with specific reference to geotechnical conditions, ecological habitat and landscape features, Soil, land capability and agricultural potential, climate and the visual landscape.

DEA Screening Report

According to the DEA Screening Report the Environmental Sensitivity of the proposed area is as follows:

| Wind and Solar developments with an approved Environmental Authorisation or applications under consideration within 30 km of the proposed area according to the DEA Screening Tool. | | | | |
|--|---------------------|----------------|-----------------------|----------------------------------|
| No | EIA Reference No | Classification | Status of application | Distance from proposed area (km) |
| 1 | 14/12/16/3/3/2/1092 | Solar PV | Approved | 7.9 |
| 2 | 14/12/16/3/3/2/1091 | Solar PV | Approved | 3.5 |
| 3 | 14/12/16/3/3/2/1062 | Solar PV | Approved | 12.2 |
| 4 | 14/12/16/3/3/2/974 | Solar PV | Approved | 3.9 |
| 5 | 14/12/16/3/3/2/1093 | Solar PV | Approved | 3.5 |
| 6 | 12/12/20/2149 | Solar PV | Approved | 17.7 |
| 7 | 14/12/16/3/3/2/975 | Solar PV | Approved | 3.9 |

According to the DEA Screening Tool the proposed development area Environmental sensitivity

The following summary of the development site environmental sensitivities is identified. Only the highest environmental sensitivity is indicated. The footprint environmental sensitivities for the proposed development footprint as identified, are indicative only and must be verified on site by a suitably qualified person before the specialist assessments identified below can be confirmed.

| Theme | Very High sensitivity | High sensitivity | Medium sensitivity | Low sensitivity |
|--|-----------------------|------------------|--------------------|-----------------|
| Agriculture Theme | | | X | |
| Animal Species Theme | | | | X |
| Aquatic Biodiversity Theme | X | | | |
| Archaeological and Cultural Heritage Theme | | | | X |
| Civil Aviation Theme | | X | | |
| Defence Theme | | | | X |
| Paleontology Theme | X | | | |
| Plant Species Theme | | | X | |
| Terrestrial Biodiversity Theme | X | | | |

Type of environment affected by the proposed activity.

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

GEOLOGY AND SOILS

The Council for Geo Science describes the gravel found in the area under application as follows:

Classification

The Kraaipan Group, most commonly found in the districts of the Northwest Province, consists of 3 groups namely the Gold Ridge Formation, Ferndale Formation and the Khunwana Formation.

The Kraaipan rocks are extensively folded, sheared and veined. The Kraaipan Formation are subdivided into a lower group, which consisted of magnetite-quartzite, a middle group comprising cherty rocks, and an upper group consisting of magnetic slate, cherty rock, pyllite and schist.

Gold Ridge Formation:

The Gold Ridge Formation comprises mainly banded ironstone with subordinate interbedded mica schist, pyrophyllite schist, and quartz-chlorite schist, amphibolite and dolomite.

The schists are fine grained and deeply weathered, which makes identification of minerals difficult. The mica- and pyrophyllite schists are monomineralic rocks; the latter show some secondary iron enrichment along the foliation planes. Quartz-chlorite schists comprise equal amounts of quartz and chlorite, with some subordinate muscovite.

The dolomite consists mainly of impure siderite which contains magnesium and calcium. Magnetite is a common secondary constituent. In all cases it shows a rhombohedral habit, and is probably pseudomorphous after siderite. Both primary and secondary quartz occur and in places the latter replaces the carbonate minerals.

Ferndale Formation:

The Ferndale Formation comprises mainly variegated banded jaspilite. The colour of this well-banded rock varies from red to yellow, white, grey, brown and black, depending on the extent and oxidation state of impurities. Microscopically the rock consists of cryptocrystalline quartz with poorly defined magnetite layers.

Khunwana Formation:

The Khunwana Formation conformably overlies the Gold Ridge Formation except where the Ferndale Jaspilite is developed. It consists mainly of banded grey recrystallised chert and/or brown jaspilite grading laterally into banded white and grey chert. Amphibolite and lava occur interbedded in the chert.

ECOLOGICAL HABITAT AND LANDSCAPE FEATURES

The result obtained by plotting the coordinates are as follow:

Carletonville Dolomite Grassland

The proposed area falls within vegetation unit Gh 15, which is known as the Carletonville Dolomite Grassland. The Carletonville Dolomite Grassland is part of the Dry Highveld Grassland, which is a sub-bioregion of the Grassland Biome.

According to Mucina and Rutherford (2006:388), Carletonville Dolomite Grassland mainly covers the North West Provinces, at times Gauteng Province and marginally into the Free State Province. In the region of Potchefstroom, Ventersdorp and Carletonville, extending westwards to the vicinity of Ottoshoop, but also occurring as far east as Centurion and Bapsfontein in Gauteng Province.

The vegetation and landscape can be described as slightly undulating plains dissected by prominent rocky chert ridges. Species-rich grasslands forming a complex mosaic pattern dominated by many species.

Some other important Taxa found on in the area:

Graminoids: *Aristida congesta* (d), *Brachiaria serrata* (d), *Cynodon dactylon* (d), *Digitaria tricholaenoides* (d), *Diheteropogon amplexans* (d), *Eragrostis chloromelas* (d), *E. racemosa* (d), *Heteropogon contortus* (d), *Loudetia simplex* (d), *Schizachyrium sanguineum* (d), *Setaria sphacelata* (d), *Themeda triandra* (d), *Alloteropsis semialata* subsp. *eckloniana*, *Andropogon schirensis*, *Aristida canescens*, *A. diffusa*, *Bewisia biflora*, *Bulbostylis burchellii*, *Cymbopogon caesius*, *C. pospischilii*, *Elionurus muticus*, *Eragrostis curvula*, *E. gummiflua*, *E. plana*, *Eustachys paspaloides*, *Hyparrhenia hirta*, *Melinis nerviglumis*, *M. repens* subsp. *repens*, *Monocymbium ceresiiforma*, *Panicum coloratum*, *Pogonarthria squarrosa*, *Trichoneura grandiglumis*, *Triraphis andropogonoides*, *Tristachya leucothrix*, *T. rehmannii*.

Herbs: *Acalypha angustata*, *Barleria macrostegia*, *Chamaecrista mimosoides*, *Chamaesyce inaequilatera*, *Crabbea angustifolia*, *Dianthus mooiensis*, *Dicoma anomala*, *Helichrysum caespitium*, *H. miconiifolium*, *H. nudifolium* var. *nudifolium*, *Ipomoea ommaneyi*, *Justicia anagalloides*, *Kohautia amatymbica*, *Kyphocarpa angustifolia*, *Ophrestia oblongifolia*, *Pollichia campestris*, *Senecio coronatus*, *Vernonia oligocephala*.

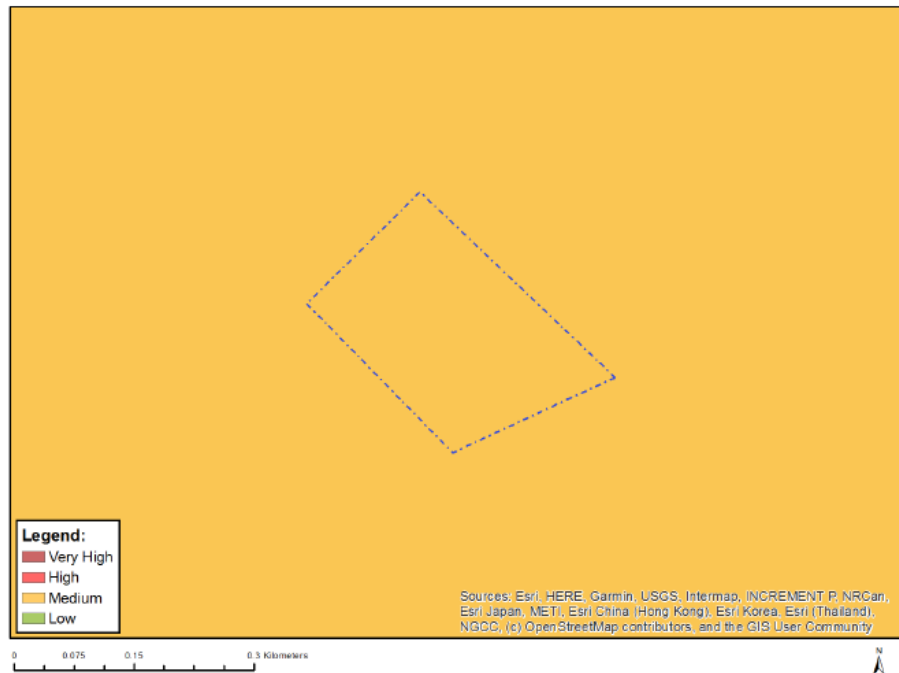


Figure 5: Plant Species Combined Sensitivity

AGRICULTURAL / LAND CAPABILITY

According to an article on the Grain SA website by Garry Paterson from ARC-Institute for Soil, Climate and Water on the Grain SA website, agriculture rests on three pillars where natural resources are concerned. These are the soil (comprising the growth medium for the plant), the climate conditions (which supply the plant with sufficient water and heat) and the terrain (enabling the crop to be physically planted, to grow and to be harvested sustainably).

The concept of land capability combines the three natural resource elements or factors listed above (soil, climate and terrain) and uses set parameters to determine a specific class for a given area. The basis of the land capability assessment in South Africa is the well-known Land Type Survey, which is a country-wide inventory of natural resources, i.e. soil pattern, macroclimate and terrain type, carried out between 1972 and 2002 by the ARC-Institute for Soil, Climate and Water.

Each unique land type is allocated to one of eight land capability classes. These classes are based on the original USDA land capability system, whereby Classes I and II comprise areas with little or no limitations to rainfed agriculture, Classes III and IV comprise those areas which are still considered arable, but with moderate to severe restrictions. Classes V to VIII comprise non-arable land with increasingly serious restrictions, either in terms of restricted soil, steep terrain, rockiness and/or an unfavourable climatic regime. (Garry Paterson, ARC-Institute for Soil, Climate and Water, November 2014.)

The proposed area falls within Land in Class VI (6). (Refer to Land capability map on **figure 6** and attached as **Appendix 5**).

[illegible]

Please see **Appendix 7** for the colour map.

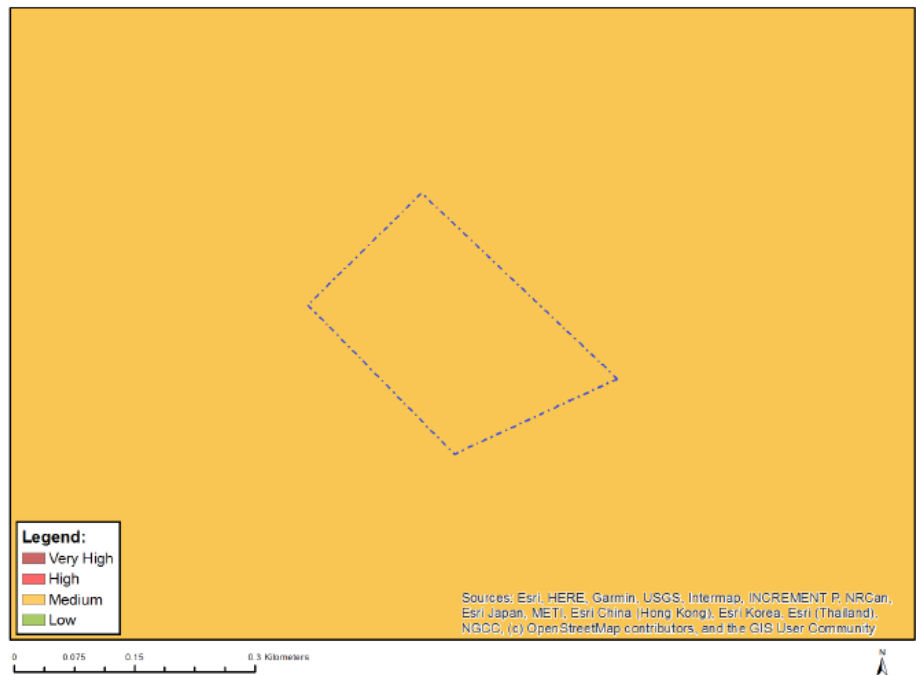


Figure 7: Agriculture Combined Sensitivity

Ecosystem threat status outlines the degree to which ecosystems are still intact or alternatively losing vital aspects of their structure, function and composition, on which their ability to provide ecosystem services ultimately depends (Driver et al. 2011). Datasets have been developed by SANBI (2016) in order to outline threatened ecosystems, with the primary objective of limiting the rate of

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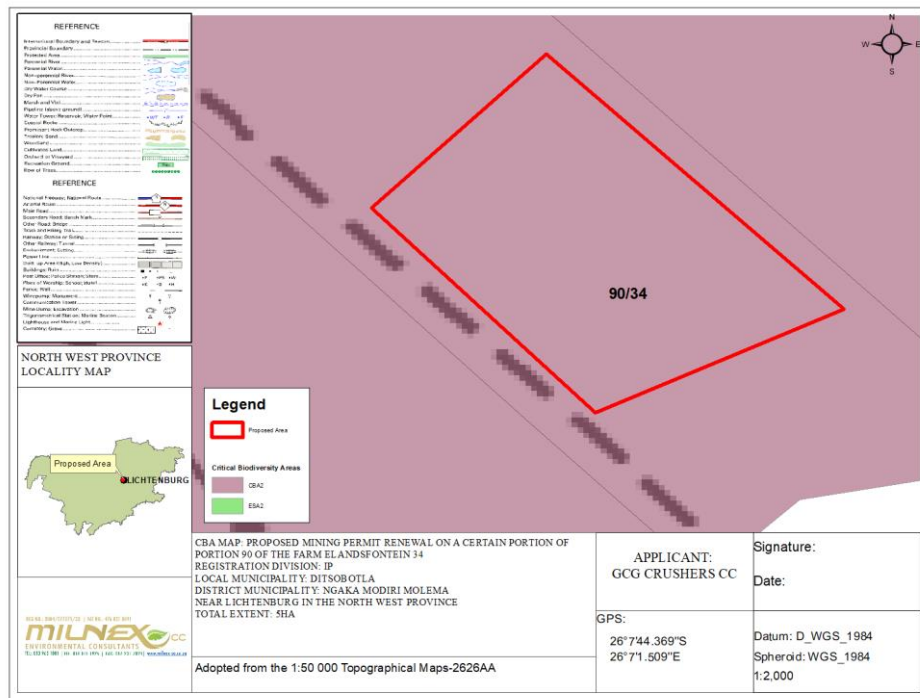


Figure 9: Critical Biodiversity Areas (CBAs) associated with the study site.

According to the DEA Screening Report the proposed area falls within Very High Terrestrial Biodiversity sensitivity. Please see **Appendix 7** for the colour map.

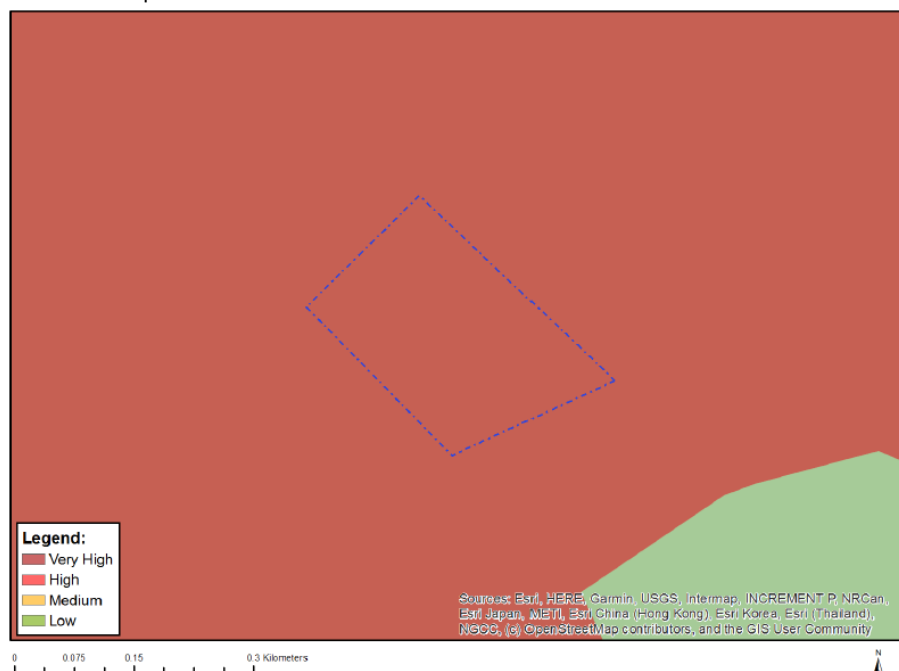


Figure 10: Terrestrial Biodiversity Combined Sensitivity

According to the DEA Screening Report the proposed area falls within Very High Aquatic Biodiversity theme sensitivity. Please see **Appendix 7** for the colour map.

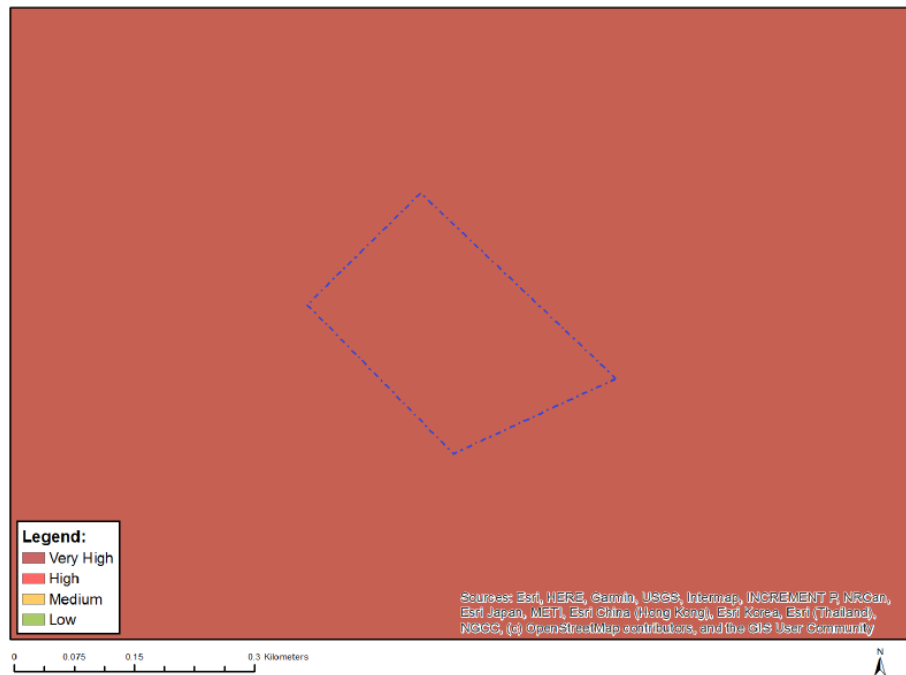


Figure 11: Aquatic Biodiversity Combined Sensitivity

Map of relative Animal Species theme sensitivity according to the DEA Screening Tool, which illustrates the Animal Species theme sensitivity falls in low sensitivity. Please see **Appendix 7** for the colour map.



Figure 12: Animal Species theme sensitivity

BIODIVERSITY PRIORITY AREAS FOR MINING

The Mining and Biodiversity Guideline was developed in 2013 for the purpose of mainstreaming biodiversity management practices into the mining sector (DEA, DMRE, Chamber of Mines, SAMBF & SANBI 2013). This Guideline provides explicit direction in terms of where mining-related impacts are legally prohibited, where biodiversity priority areas may present high risks for mining projects, and where biodiversity may limit the potential for mining. The Guideline distinguishes between four categories of biodiversity priority areas in relation to their importance from a biodiversity and ecosystem service perspective as well as the implications for mining in these areas (**Table 2**).

Table: Four categories of biodiversity priority areas in relation to their biodiversity importance and implications for mining.

| Category | Biodiversity Priority Areas | Risks for Mining | Implications for Mining |
|---|--|--------------------------------|--|
| A. Legally Protected | <ul style="list-style-type: none"> Protected areas (including National Parks, Nature Reserves, World Heritage Sites, Protected Environments, Nature Reserves) Areas declared under Section 49 of the Mineral and Petroleum Resources Development Act (No. 28 of 2002) | Mining Prohibited | <p>Mining projects cannot commence as mining is legally prohibited. Although mining is prohibited in Protected Areas, it may be allowed in Protected Environments if both the Minister of Mineral Resources and Minister of Environmental Affairs approve it.</p> <p>In cases where mining activities were conducted lawfully in protected areas before Section 48 of the Protected Areas Act (No. 57 of 2003) came into effect, the Minister of Environmental Affairs may, after consulting with the Minister of Mineral Resources, allow such mining activities to continue, subject to prescribed conditions that reduce environmental impacts.</p> |
| B. Highest Biodiversity Importance | <ul style="list-style-type: none"> Critically endangered and endangered ecosystems Critical Biodiversity Areas (or equivalent areas) from provincial spatial biodiversity plans River and wetland Freshwater Ecosystem Priority Areas (FEPAs) and a 1km buffer around these FEPAs Ramsar Sites | Highest Risk for Mining | <p>Environmental screening, environmental impact assessment (EIA) and their associated biodiversity specialist studies should focus on confirming the presence and significance of these biodiversity features, and to provide site-specific basis on which to apply the mitigation hierarchy to inform regulatory decision-making for mining, water use licences, and environmental authorisations.</p> <p>If they are confirmed, the likelihood of a fatal flaw for new mining projects is very high because of the significance of the biodiversity features in these areas and the associated ecosystem services. These areas are viewed as necessary to ensure protection of biodiversity, environmental sustainability, and human well-being.</p> <p>An EIA should include the strategic assessment of optimum, sustainable land use for an area and will determine the significance of the impact on biodiversity.</p> <p>This assessment should fully consider the environmental sensitivity of the area, the overall environmental and socio-economic costs and benefits of mining, as well as the potential strategic importance of the minerals to the country.</p> <p>Authorisations may well not be granted. If granted, the authorisation may set limits on allowed activities and impacts and may specify biodiversity offsets that would be written into licence agreements and/or authorisations.</p> |
| C. High Biodiversity Importance | <ul style="list-style-type: none"> Protected area buffers (including buffers around National Parks, World Heritage Sites* and Nature Reserves) | High Risk for Mining | <p>These areas are important for conserving biodiversity, for supporting or buffering other biodiversity priority areas, and for maintaining important ecosystem services for communities or the country.</p> |

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Milnex CC

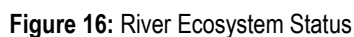
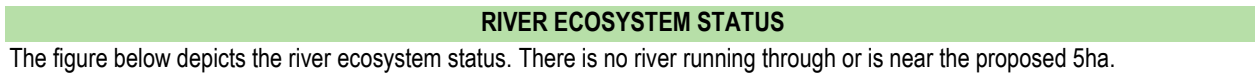
In terms of Section 1 of the National Water Act (No. 36 of 1998) (NWA), wetlands are legally defined as: “*land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil*” (NWA 1998).

A wide variety of wetland types are present in South Africa, and can be classified into six broad types, namely floodplain wetlands, unchannelled valley bottom wetlands, channelled valley bottom wetlands, seeps, depressions and wetland flats. Owing to the large variations in climate and topography across South Africa, vegetation and habitat associated with these wetland types vary tremendously from subtropical reed beds and tall swamp forests to arid salt pans, which all support unique and varied animal life.

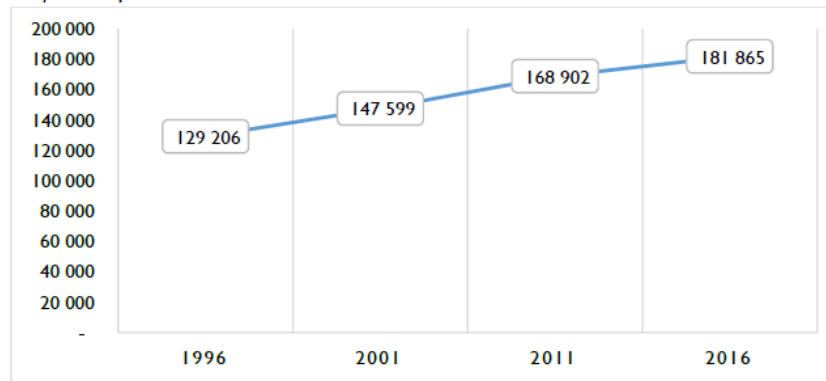
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Milnex CC

Figure 15: Wetland vegetation types associated with the study site.



Graph 1: Population Growth Trends



Sources: Census 1996, 2001 and 2011 except for 2016 (Community Survey, 2016)

The number of households have increased from a base of 44 5002 during 2011 to an estimated 54 5003. The average household size has declined from 3.8 to 3.4 family members during the same period. This figure supports the upward trend movement of people migrating from farms to urban centres (Lichtenburg) in search of economic opportunities, employment and access to services.

Gender Profile

According to the Community Survey 2016, the gender structure in Ditsobotla is male dominated with the male/female ratio of 51:49. The male population is 93 421 compare to the female figure of 88 444 people. This figure is similar to that of the North West Province but slightly different from that of Ngaka Modiri Molema district area, which reveals a male/female ration of 49:51.

Economic Profile

The table below shows the share of GDPR contributed by each sector in Ditsobotla Local Municipality, Ngaka Modiri Molema District, the North West Province and South Africa.

| Sector | North West | | Ngaka Modiri Molema | | Ditsobotla Local Municipality | |
|--|-------------|-------------|---------------------|-------------|-------------------------------|-------------|
| | 2011 | 2012 | 2011 | 2012 | 2011 | 2012 |
| Agriculture | 8% | 8% | 5% | 6% | 9% | 10% |
| Mining | 15% | 16% | 4% | 4% | 13% | 13% |
| Manufacturing | 11% | 13% | 6% | 6% | 17% | 17% |
| Electricity and Water | 2% | 2% | 3% | 3% | 0% | 0% |
| Construction | 2% | 2% | 2% | 2% | 2% | 3% |
| Trade | 10% | 10% | 10% | 10% | 11% | 11% |
| Transport | 9% | 8% | 7% | 7% | 8% | 8% |
| Finance | 13% | 12% | 16% | 14% | 15% | 13% |
| Community Service (including government) | 30% | 29% | 48% | 49% | 24% | 25% |
| Total | 100% | 100% | 100% | 100% | 100% | 100% |

Source: IHS Global Insight 2013

The table above indicates that the GDPR of the municipality was slightly more than R5 billion during 2012. The Community Services (including Government) sector made the biggest contribution with 25% to the economy of Ditsobotla Municipality in 2012. The contribution of the Community Services has, increased from 24% in 2011, and is currently still far less than the average contributions made by this sector at the district level. This shows that although this sector is still the highest in the municipality, it is not as important when compared to the average of the district.

The second highest GDP contributing sectors in the municipality is that of the manufacturing sector (17%) followed by mining and the finance (13%) respectively. In the instance of both the manufacturing and mining sectors, they are much more than the average of the district and are not far behind that of the province. This shows the importance of both the sectors for the municipality. This probably contributes towards the strong trade sector in the municipality and the spin-offs created by the trade sector towards the finance sector.

The agriculture sector contributed approximately 10% to the economy of the municipality, constituting a higher share in its economy than in the province (8%) and district with 6%. The agriculture share to the municipality's economy has however increased from the 9% contribution in 2011. Again, this shows that agriculture is an important contributor to the economy of the municipality.

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The electricity and water, construction transport sectors share has remained relatively constant over the aforementioned timeframe and are well within the average range of both the district and the provincial contributions.

Interestingly the manufacturing sector is the second highest contributor to GDP, even higher than both district and province. This shows that there is great scope for local manufacturing and further beneficiation in this area.

Table: Percentage contribution of local municipalities to sectoral Gross Value Add of Ngaka Modiri Molema, 2012

| | Ditsobotla | Mahikeng | Ramotshere | Ratlou | Tswaing | NMMDM |
|---------------------------------------|------------|----------|------------|--------|---------|-------|
| Agriculture | 33.4% | 15.8% | 9.0% | 20.7% | 21.0% | 100% |
| Mining | 63.0% | 16.8% | 11.3% | 2.3% | 6.5% | 100% |
| Manufacturing | 53.7% | 21.8% | 16.6% | 3.4% | 4.5% | 100% |
| Electricity & water | 2.1% | 71.1% | 17.5% | 9.0% | 0.2% | 100% |
| Construction | 20.9% | 55.2% | 11.0% | 9.7% | 3.3% | 100% |
| Wholesale and trade | 21.1% | 59.9% | 17.4% | 7.1% | 2.5% | 100% |
| Transport | 21.1% | 58.3% | 8.2% | 9.7% | 2.6% | 100% |
| Finance | 17.7% | 50.3% | 13.5% | 11.4% | 7.1% | 100% |
| Community services (incl. Government) | 9.6% | 66.1% | 10.8% | 10.9% | 2.7% | 100% |

The table above gives an indication of the contribution made by each municipality to the district GVA and each of its sectors. From this table, it is possible to see how the Ditsobotla Local Municipality is performing compared to other municipalities in the Ngaka Modiri Molema District.

Ditsobotla contributes the most to the district GVA in mining (63.0%), in manufacturing (53.7%) and in agriculture (33.4%). These areas are the strength of the municipality and would be easy to further exploit. While the wholesale trade sector (21.1%) falls way behind that of Mahikeng, this is a potential area of growth for the municipality.

CULTURAL AND HERITAGE ASPECTS

According to the DEA Screening Report the proposed area falls within low Archaeological and Cultural Heritage Theme Sensitivity. Please see map colour map under **Appendix 7**.



Figure 18: Archaeological and Cultural Heritage Combined Sensitivity

According to the DEA Screening Report the proposed area falls within Very High Paleontology Theme Sensitivity. Please see map colour map under **Appendix 7**.

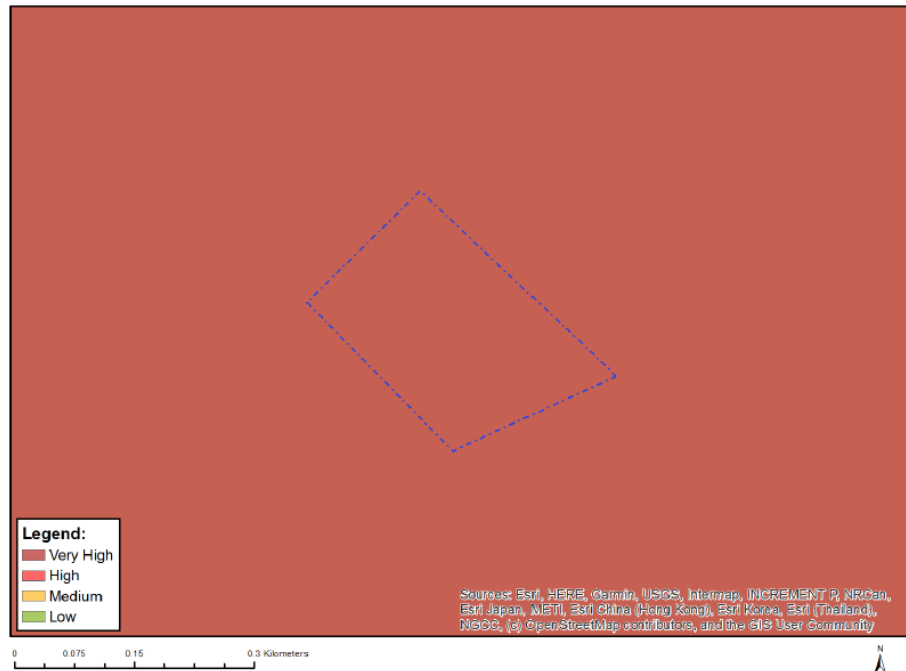


Figure 19: Relative Paleontology Theme Sensitivity

Cultural Heritage in South Africa (includes all heritage resources) is protected by the **National Heritage Resources Act (Act 25 of 1999) (NHRA)**. According to Section 3 of the Act, all Heritage resources include “**all objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens**”.

If such resources are found during the mining or development activities, they shall not be disturbed without a permit from the relevant heritage resource Authority, which means that before such sites are disturbed by development it is incumbent on the developer to ensure that a heritage impact assessment is done and the Provincial Heritage Resources Authority and SAHRA must be contacted immediately and work must stop.

If anything of Archaeological and/or paleontological significance is found during the construction and operational phase of the mine the following applies:

- NHRA 38(4)c(i) – If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (021 462 5402) must be alerted as per section 35(3) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule;
- NHRA 38(4)c(ii) – If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (012 320 8490), must be alerted immediately as per section 36(6) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule;
- NHRA 38(4)e – The following conditions apply with regards to the appointment of specialists: i) If heritage resources are uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA;

If fossil remains or trace fossils are discovered during any phase of construction, either on the surface or exposed by excavations the **Chance Find Protocol** must be implemented by the Environmental Control Officer (ECO) in charge of these developments. These discoveries ought to be protected and the ECO must report to SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that mitigation can be carry out by a paleontologist.

Chance Find Procedure

- If a chance find is made the person responsible for the find must immediately stop working and all work that could impact that finding must cease in the immediate vicinity of the find.
- The person who made the find must immediately report the find to his/her direct supervisor which in turn must report the find to his/her manager and the ESO or site manager. The ESO or site manager must report the find to the relevant Heritage Agency (South African Heritage Research Agency, SAHRA). (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za). The information to the Heritage Agency must include photographs of the find, from various angles, as well as the GPS co-ordinates.
- A preliminary report must be submitted to the Heritage Agency within 24 hours of the find and must include the following: 1) date of the find; 2) a description of the discovery and a 3) description of the fossil and its context (depth and position of the fossil), GPS co-ordinates.
- Photographs (the more the better) of the discovery must be of high quality, in focus, accompanied by a scale. It is also important to have photographs of the vertical section (side) where the fossil was found.

Upon receipt of the preliminary report, the Heritage Agency will inform the ESO (or site manager) whether a rescue excavation or rescue collection by a palaeontologist is necessary.

- The site must be secured to protect it from any further damage. No attempt should be made to remove material from their environment. The exposed finds must be stabilized and covered by a plastic sheet or sandbags. The Heritage agency will also be able to advise on the most suitable method of protection of the find.
- In the event that the fossil cannot be stabilized the fossil may be collected with extreme care by the ESO (site manager). Fossils finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site.
- Once Heritage Agency has issued the written authorization, the developer may continue with the development on the affected area.

DESCRIPTION OF THE CURRENT LAND USES.

According to **Figure 20 and Figure 21** the proposed area is covered by natural vegetation. The natural vegetation consists mostly of Low Shrublands and a small area of Grasslands according to the land use map.

There is an existing mine on Portion 90 of the farm Elandsfontein 34, please see the Google earth maps (**figure 22, figure 23 and Appendix 5**) below.

If applicable a Water Use License Application will be launched for mining operations. The mineral will not be processed on the proposed 5ha area.

All infrastructure will be temporary and/or mobile.

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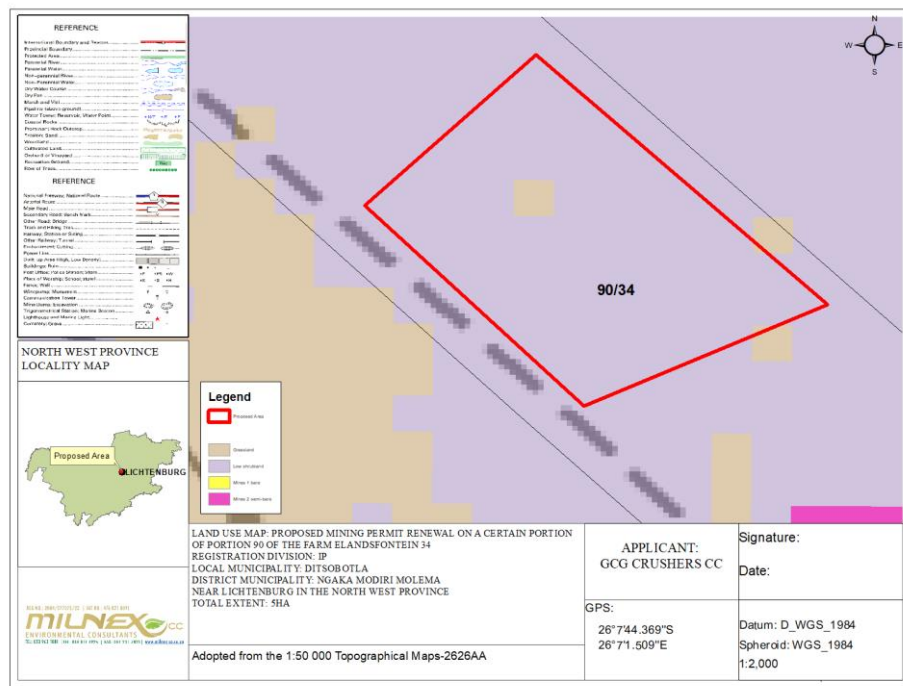


Figure 20: Land use map associated with study site and surrounding areas.

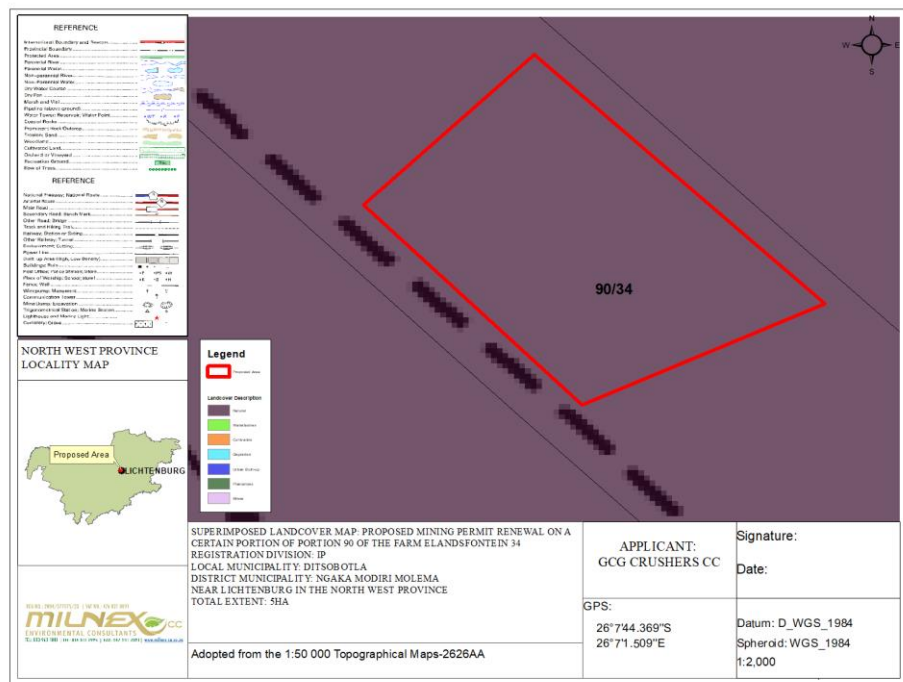


Figure 21: Landcover map associated with study site and surrounding areas.

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Figure 22: Google earth map of the proposed area.

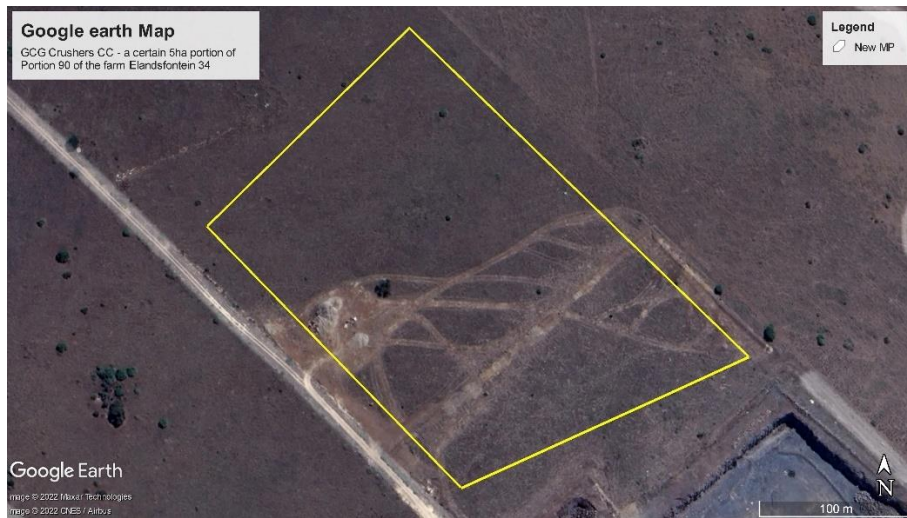


Figure 23: Google earth map of the proposed area, zoomed in.

v) **IMPACTS AND RISKS IDENTIFIED INCLUDING THE NATURE, SIGNIFICANCE, CONSEQUENCE, EXTENT, DURATION AND PROBABILITY OF THE IMPACTS, INCLUDING THE DEGREE TO WHICH THESE IMPACTS**

- (aa) can be reversed;
- (bb) may cause irreplaceable loss of resources; and
- (cc) can be avoided, managed or mitigated;

Significance of potential impacts

The following sections present the outcome of the significance rating exercise. The results suggest that the mining activities will have an impact on the natural vegetation and the agricultural activities, if not properly mitigated.

INITIAL CLEARANCE AND SITE PREPARATION PHASE

Direct impacts: During this phase minor negative impacts are foreseen over the short term. The latter refers to a period of weeks. The site preparation may result in the loss or fragmentation of indigenous natural fauna and flora, loss or fragmentation of habitats, soil erosion, hydrology, and temporary noise disturbance, generation of waste, visual intrusions, increase in heavy vehicle traffic, and risk to safety, livestock and farm infrastructure, and increased risk of veld fires. The abovementioned impacts are discussed in more detail below:

- Loss, destruction or fragmentation of indigenous natural fauna and flora:

The proposed area falls within vegetation unit Gh 15, which is known as the Carletonville Dolomite Grassland. The Carletonville Dolomite Grassland is part of the Dry Highveld Grassland, which is a sub-bioregion of the Grassland Biome.

According to Mucina and Rutherford (2006:388), Carletonville Dolomite Grassland mainly covers the North West Provinces, at times Gauteng Province and marginally into the Free State Province. In the region of Potchefstroom, Ventersdorp and Carletonville, extending westwards to the vicinity of Ottoshoop, but also occurring as far east as Centurion and Bapsfontein in Gauteng Province.

The vegetation and landscape can be described as slightly undulating plains dissected by prominent rocky chert ridges. Species-rich grasslands forming a complex mosaic pattern dominated by many species.

Mucina and Rutherford (2006:388) also states that the conservation is vulnerable with a target of 24%. Small extent conserved in statutory (Sterfontein Caves – Part of the Cradle of Humankind World Heritage Site, Oog van Malmanie, Abe Bailey, Boskop Dam, Schoonspruit, Krugersdorp, Olifantsvlei, Groenkloof) and in at least six private conservation areas. Almost a quarter already transformed for cultivation, by urban sprawl or by mining activity as well as the building of the Boskop and Klerkskraal Dams. Erosion of this vegetation type is very low (84%) and low (15%).

DEA Screening Report findings:

- *Plant Species theme sensitivity:* Medium sensitivity
- *Aquatic Biodiversity sensitivity:* Very High sensitivity
- *Terrestrial Biodiversity sensitivity:* Very High sensitivity.
- *Animal Species sensitivity:* Low sensitivity

| Loss or fragmentation of indigenous natural fauna and flora | Pre-mitigation impact rating | Post mitigation impact rating |
|--|-------------------------------------|--------------------------------------|
| Status (positive or negative) | Negative | Negative |
| Extent | Site (1) | Site (1) |
| Probability | Definite (4) | Definite (4) |
| Duration | Long term (3) | Medium (2) |
| Magnitude | High (3) | Medium (2) |
| Reversibility | Barely reversible (3) | Partly reversible (2) |

| | | |
|---------------------------------|---|----------------------------------|
| Irreplaceable loss of resources | Significant loss of resource (3) | Significant loss of resource (3) |
| Cumulative impact | Medium cumulative impacts (3) | |
| Significance | Negative high (51) | Negative medium (30) |
| Can impacts be mitigated? | <p>If the development is approved, contractors must ensure that no mammalian species are disturbed, trapped, hunted or killed. If the development is approved, every effort should be made to confine the footprint to the blocks allocated for the development and have the least possible edge effects on the surrounding area. The EMPr also provides numerous mitigation measures – refer to section (f) of the EMPr.</p> <p>The potential impacts associated with damage to and loss of farmland should be effectively mitigated. The aspects that should be covered include:</p> <ul style="list-style-type: none"> • The site should be fenced off prior to commencement of construction activities; • The footprint associated with the construction related activities (access roads, construction platforms, workshop etc.) should be confined to the fenced off area and minimised where possible; • An Environmental Control Officer (ECO) should be appointed to monitor the establishment phase of the construction phase; • All areas disturbed by construction related activities, such as access roads on the site, construction platforms, workshop area etc., should be rehabilitated at the end of the construction phase; • The implementation of a rehabilitation programme should be included in the terms of reference for the contractor/s appointed. Specifications for the rehabilitation are provided throughout the EMPr – section (f) of the EMPr. • The implementation of the Rehabilitation Programme should be monitored by the ECO. | |

• Loss destruction or fragmentation of habitats

According to **Figure 20 and Figure 21** the proposed area is covered by natural vegetation. The natural vegetation consists mostly of Low Shrublands and a small area of Grasslands according to the land use map.

There is an existing mine on Portion 90 of the farm Elandsfontein 34, please see the Google earth maps (**figure 22, figure 23 and Appendix 5**).

DEA Screening Report findings:

- *Plant Species theme sensitivity:* Medium sensitivity
- *Aquatic Biodiversity sensitivity:* Very High sensitivity
- *Terrestrial Biodiversity sensitivity:* Very High sensitivity.
- *Animal Species sensitivity:* Low sensitivity

| Loss or fragmentation of habitats | Pre-mitigation impact rating | Post mitigation impact rating |
|-----------------------------------|----------------------------------|----------------------------------|
| Status (positive or negative) | Negative | Negative |
| Extent | Site (1) | Site (1) |
| Probability | Definite (4) | Definite (4) |
| Duration | Permanent (4) | Medium (2) |
| Magnitude | High (3) | Medium (2) |
| Reversibility | Barely reversible (3) | Partly reversible (2) |
| Irreplaceable loss of resources | Significant loss of resource (3) | Significant loss of resource (3) |

| | | |
|---------------------------|---|-----------------------------|
| Cumulative impact | Medium cumulative impacts (3) | |
| Significance | Negative high (54) | Negative medium (30) |
| Can impacts be mitigated? | Exotic and invasive plant species should not be allowed to establish, if the development is approved. Where exotic and invasive plant species are found at the site continuous eradication should take place. If the development is approved, every effort should be made to confine the footprint to the blocks allocated for development – section (f) of the EMPr also provides numerous mitigation measures related to fauna and flora. | |

- Loss of topsoil – Topsoil may be lost due to poor topsoil management (burial, erosion, etc.) during construction related soil profile disturbance (levelling, excavations, disposal of spoils from excavations etc.) The effect will be the loss of soil fertility on disturbed areas after rehabilitation.

| Loss of topsoil | Pre-mitigation impact rating | Post mitigation impact rating |
|---------------------------------|---|--------------------------------------|
| Status (positive or negative) | Negative | Negative |
| Geographical extent | Site (1) | Site (1) |
| Probability | Definite (4) | Possible (2) |
| Duration | Permanent (4) | Medium term (2) |
| Magnitude | Very high (4) | High (3) |
| Reversibility | Barely reversible (3) | Partly reversible (2) |
| Irreplaceable loss of resources | Significant loss of resource (3) | Marginal loss (2) |
| Cumulative impact | High cumulative impact (4). | |
| Significance | Negative very high (76) | Negative Medium (39) |
| Can impacts be mitigated? | <p>The following mitigation or management measures are provided:</p> <ul style="list-style-type: none"> • If an activity will mechanically disturb below surface in any way, then any available topsoil should first be stripped from the entire surface and stockpiled for re-spreading during rehabilitation. • Topsoil stockpiles must be conserved against losses through erosion by establishing vegetation cover on them. • Dispose of all subsurface spoils from excavations where they will not impact on undisturbed land. • During rehabilitation, the stockpiled topsoil must be evenly spread over the entire disturbed surface. • Erosion must be controlled where necessary on top soiled areas. <p>Establish an effective record keeping system for each area where soil is disturbed for constructional purposes. These records should be included in environmental performance reports, and should include all the records below.</p> <ul style="list-style-type: none"> • Record the GPS coordinates of each area. • Record the date of topsoil stripping. • Record the GPS coordinates of where the topsoil is stockpiled. • Record the date of cessation of constructional (or operational) activities at the particular site. • Photograph the area on cessation of constructional activities. • Record date and depth of re-spreading of topsoil. • Photograph the area on completion of rehabilitation and on an annual basis thereafter to show vegetation establishment and evaluate progress of restoration over time. <p>Section (f) of the EMPr also provide mitigation measures related to topsoil management.</p> | |

- Soil erosion – Soil erosion due to alteration of the land surface run-off characteristics. Alteration of run-off characteristics may be caused, by construction related land surface disturbance, mining activities, vegetation removal and the establishment of roads. Erosion will cause loss and deterioration of soil resources.

| Soil erosion | Pre-mitigation impact rating | Post mitigation impact rating |
|---------------------------------|---|-------------------------------|
| Status (positive or negative) | Negative | Negative |
| Geographical extent | Local (2) | Site (1) |
| Probability | Definite (4) | Possible (2) |
| Duration | Permanent (4) | Medium term (2) |
| Magnitude | High (3) | High (3) |
| Reversibility | Permanent (4) | Completely reversible (1) |
| Irreplaceable loss of resources | Significant loss of resource (3) | Marginal loss of resource (2) |
| Cumulative impact | High cumulative impact (4). | |
| Significance | Negative high (63) | Negative medium (36) |
| Can impacts be mitigated? | <ul style="list-style-type: none"> • The following mitigation or management measures are provided: Implement an effective system of run-off control, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion. • Monitor the area regularly after larger rainfall events to determine where erosion may be initiated and then mitigate by modifying the soil micro-topography and revegetation or soil erosion control efforts accordingly. <p>Include periodical site inspection in environmental performance reporting that inspects the effectiveness of the run-off control system and specifically records the occurrence any erosion on site or downstream – refer to section (f) of the EMPr..</p> | |

- Temporary noise disturbance - Preparation activities will result in the generation of noise over a period of months. Sources of noise are likely to include vehicles, the use of machinery such as back actors and people working on the site. The noise impact is unlikely to be significant since there is an existing mine and a processing plant on a certain portion of Portion 90 of the farm Elandsfontein 34, but activities should be limited to normal working days and hours (6:00 – 18:00) if possible.

| Temporary noise disturbance | Pre-mitigation impact rating | Post mitigation impact rating |
|---------------------------------|---|-------------------------------|
| Status (positive or negative) | Negative | Negative |
| Extent | Site (1) | Site (1) |
| Probability | Definite (4) | Possible (2) |
| Duration | Medium term (2) | Medium term (2) |
| Magnitude | Medium (2) | Medium (2) |
| Reversibility | Completely reversible (1) | Completely reversible (1) |
| Irreplaceable loss of resources | Marginal loss (2) | Marginal loss (2) |
| Cumulative impact | Medium cumulative impact (3). | |
| Significance | Negative low (26) | Negative low (22) |
| Can impacts be mitigated? | Yes, management actions related to noise pollution are included in section (f) of the EMPr. | |

- Generation of waste - general waste, construction waste, sewage and grey water - The workers on site are likely to generate general waste such as food wastes, packaging, bottles, etc. The applicant will need to ensure that general waste is appropriately

disposed of i.e. taken to the nearest licensed landfill. Sufficient ablution facilities will have to be provided, in the form of portable/VIP toilets.

There are existing facilities since there is an existing mine and a processing plant on a certain portion of Portion 90 of the farm Elandsfontein 34

| Generation of waste | Pre-mitigation impact rating | Post mitigation impact rating |
|---------------------------------|--|-------------------------------|
| Status (positive or negative) | Negative | Negative |
| Extent | Site (1) | Site (1) |
| Probability | Probable (3) | Possible (2) |
| Duration | Medium term (2) | Medium term (2) |
| Magnitude | Medium (2) | Low (1) |
| Reversibility | Irreversible (4) | Irreversible (4) |
| Irreplaceable loss of resources | Marginal of resource (2) | No loss of resource (1) |
| Cumulative impact | Low cumulative impact (2) - An additional demand for landfill space could result in significant cumulative impacts if services become unstable or unavailable, which in turn would negatively impact on the local community. | |
| Significance | Negative low (28) | Negative low (12) |
| Can impacts be mitigated? | Yes, it is therefore important that all management actions and mitigation measures included in section (f) of the EMPr are implemented. | |

Impacts on heritage objects –

DEA Screening Report findings:

- *Paleontology Theme Sensitivity:* Very High sensitivity
- *Archaeological and Cultural Heritage Theme Sensitivity:* Low Sensitivity

Cultural Heritage in South Africa (includes all heritage resources) is protected by the **National Heritage Resources Act (Act 25 of 1999) (NHRA)**. According to Section 3 of the Act, all Heritage resources include “**all objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens**”.

If such resources are found during the mining or development activities, they shall not be disturbed without a permit from the relevant heritage resource Authority, which means that before such sites are disturbed by development it is incumbent on the developer to ensure that a heritage impact assessment is done and the Provincial Heritage Resources Authority and SAHRA must be contacted immediately and work must stop.

If anything of Archaeological and/or paleontological significance is found during the construction and operational phase of the mine the following applies:

- NHRA 38(4)c(i) – If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (021 462 5402) must be alerted as per section 35(3) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule;
- NHRA 38(4)c(ii) – If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (012 320 8490), must be alerted immediately as per section 36(6) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule;
- NHRA 38(4)e – The following conditions apply with regards to the appointment of specialists: i) If heritage resources are uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA;

If fossil remains or trace fossils are discovered during any phase of construction, either on the surface or exposed by excavations the **Chance Find Protocol** must be implemented by the Environmental Control Officer (ECO) in charge of these developments. These discoveries ought to be protected and the ECO must report to SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that mitigation can be carry out by a paleontologist.

Chance Find Procedure

- If a chance find is made the person responsible for the find must immediately stop working and all work that could impact that finding must cease in the immediate vicinity of the find.
- The person who made the find must immediately report the find to his/her direct supervisor which in turn must report the find to his/her manager and the ESO or site manager. The ESO or site manager must report the find to the relevant Heritage Agency (South African Heritage Research Agency, SAHRA). (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za). The information to the Heritage Agency must include photographs of the find, from various angles, as well as the GPS co-ordinates.
- A preliminary report must be submitted to the Heritage Agency within 24 hours of the find and must include the following: 1) date of the find; 2) a description of the discovery and a 3) description of the fossil and its context (depth and position of the fossil), GPS co-ordinates.
- Photographs (the more the better) of the discovery must be of high quality, in focus, accompanied by a scale. It is also important to have photographs of the vertical section (side) where the fossil was found.

Upon receipt of the preliminary report, the Heritage Agency will inform the ESO (or site manager) whether a rescue excavation or rescue collection by a palaeontologist is necessary.

- The site must be secured to protect it from any further damage. No attempt should be made to remove material from their environment. The exposed finds must be stabilized and covered by a plastic sheet or sand bags. The Heritage agency will also be able to advise on the most suitable method of protection of the find.
- In the event that the fossil cannot be stabilized the fossil may be collected with extreme care by the ESO (site manager). Fossils finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site.
- Once Heritage Agency has issued the written authorization, the developer may continue with the development on the affected area.

| Impacts on heritage objects | Pre-mitigation impact rating | Post mitigation impact rating |
|---------------------------------|--|-------------------------------|
| Status (positive or negative) | Negative | Negative |
| Extent | Site (1) | Site (1) |
| Probability | Possible (2) | Possible (2) |
| Duration | Medium (2) | Medium (2) |
| Magnitude | High (3) | Low (1) |
| Reversibility | Irreversible (4) | Irreversible (4) |
| Irreplaceable loss of resources | Complete loss of resource (4) | Marginal loss of resource (2) |
| Cumulative impact | Medium cumulative impact (3). Should these impacts occur, there may be a cumulative impact on the preservation of heritage objects in the area. | |
| Significance | Negative medium (48) | Negative low (14) |
| Can impacts be mitigated? | If archaeological sites or graves are exposed during construction work, it should immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made. Also refer to section (f) of the EMP. | |

Indirect impacts: The nuisance aspects generally associated with the installation of infrastructure or ground preparation will also be applicable to this development, which relates primarily to the increase in vehicle traffic associated with mining practices, the influx of job seekers to the area, risk to safety, livestock and farm infrastructure, and increased risk of veld fires.

- Increase in vehicle traffic – The movement of heavy vehicles have the potential to damage local farm roads and create dust and safety impacts for other road users in the area. Access will be obtained from existing gravel roads off the R503. The volume of traffic along this road is **low** and the movement of heavy vehicles along this gravel road is likely to damage the road surface and impact on other road users. The contractor should be required to ensure that damage to the gravel road is repaired periodically. The movement of additional heavy vehicle traffic will add significantly to the current traffic load on the road. The impact on the gravel roads is therefore likely to be moderate.

| Increase in vehicle traffic | Pre-mitigation impact rating | Post mitigation impact rating |
|---------------------------------|--|-------------------------------|
| Status (positive or negative) | Negative | Negative |
| Extent | Local (2) | Site (1) |
| Probability | Possible (2) | Unlikely (1) |
| Duration | Medium term (2) | Medium term (2) |
| Magnitude | Medium (2) | Low (1) |
| Reversibility | Completely reversible (1) | Completely reversible (1) |
| Irreplaceable loss of resources | Marginal loss of resource (2) | No loss of resource (1) |
| Cumulative impact | Low cumulative impact (3). If damage to roads is not repaired, then this will affect the farming activities in the area and result in higher maintenance costs for vehicles of local farmers and other road users. The costs will be borne by road users who were no responsible for the damage. | |
| Significance | Negative low impacts (24) | Negative low (9) |
| Can impacts be mitigated? | <p>The potential impacts associated with heavy vehicles can be effectively mitigated. The mitigation measures include:</p> <ul style="list-style-type: none"> • The contractor must ensure that damage caused by construction on the off-gravel roads. The costs associated with the repair must be borne by the contractor; • Dust suppression measures must be implemented for heavy vehicles such as wetting of gravel roads on a regular basis and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers; • All vehicles must be road-worthy and drivers must be qualified and made aware of the potential road safety issues and need for strict speed limits. <p>Also refer section (f) of the EMP. For mitigation measures related to traffic.</p> | |

- Risk to safety, livestock / game and infrastructure - The presence on and movement of workers on and off the site poses a potential safety threat to local farmer's, farm workers, and the communities in the vicinity of the site. In addition, infrastructure, such as fences and gates, may be damaged and livestock losses may also result from gates being left open and/or fences being damaged or livestock theft linked either directly or indirectly to the presence of mine workers on the site.

However, this above mentioned is unlikely because there is an existing mine on a certain portion of Portion 90 of the farm Elandsfontein 34. The proposed 5ha is also not used for any other activities.

| Risk to safety, livestock and infrastructure | Pre-mitigation impact rating | Post mitigation impact rating |
|--|------------------------------|-------------------------------|
| Status (positive or negative) | Negative | Negative |
| Extent | Local (2) | Local (2) |
| Probability | Possible (2) | Unlikely (1) |
| Duration | Medium term (2) | Medium term (2) |
| Magnitude | Medium (2) | Low (1) |
| Reversibility | Partly reversible (2) | Completely reversible (1) |

| | | |
|---------------------------------|---|--------------------------|
| Irreplaceable loss of resources | Marginal resource (2) | Marginal resource (2) |
| Cumulative impact | Low cumulative effects (2), provided losses are compensated for. | |
| Significance | Negative low (24) | Negative low (10) |
| Can impacts be mitigated? | <p>Key mitigation measures include:</p> <ul style="list-style-type: none"> • GCG Crushers CC should enter into an agreement with the landowner / local farmers in the area whereby damages to farm property etc. during the construction phase will be compensated for. The agreement should be signed before the construction phase commences; • The construction area should be fenced off prior to the commencement of the construction phase. The movement of construction workers on the site should be confined to the fenced off area; • Contractors appointed by GCG Crushers CC should provide daily transport for low and semi-skilled workers to and from the site. This would reduce the potential risk of trespassing on the remainder of the farm and adjacent properties. • GCG Crushers CC should hold contractors liable for compensating landowner/local farmers in full for any crop losses / livestock losses and/or damage to infrastructure that can be linked to construction workers. This should be contained in the Code of Conduct to be signed between the proponent, the contractors and neighbouring landowners. The agreement should also cover losses and costs associated with fires caused by construction workers or construction related activities (see below); • The Environmental Management Programme (EMPr) should outline procedures for managing and storing waste on site, specifically plastic waste that poses a threat to livestock if ingested. • Contractors appointed GCG Crushers CC must ensure that all workers are informed at the outset of the construction phase of the conditions contained on the Code of Conduct, specifically consequences of stock theft and trespassing on adjacent farms. • Contractors appointed by GCG Crushers CC must ensure that construction workers who are found guilty of trespassing, stealing livestock and/or damaging infrastructure are dismissed and charged. This should be contained in the Code of Conduct. All dismissals must be in accordance with South African labour legislation; • The housing of construction workers on the site should be strictly limited to security personnel (if any). | |

- Increased risk of veld fires - The presence of workers, construction- and mining related activities on the site poses an increased risk of grass fires that could in turn pose a threat to livestock, crops, wildlife, farmsteads and the communities in the area. In the process, infrastructure may also be damaged or destroyed and human lives threatened. The potential risk of grass fires was heightened by the windy conditions in the area, especially during the dry, windy winter months from May to October. Fire-fighting equipment should be provided on site during the construction phase.

| Increased risk of veld fires | Pre-mitigation impact rating | Post mitigation impact rating |
|-------------------------------|------------------------------|-------------------------------|
| Status (positive or negative) | Negative | Negative |
| Extent | Local (2) | Site (1) |
| Probability | Probable (3) | Possible (2) |
| Duration | Medium term (2) | Medium term (2) |

| | | |
|---------------------------------|--|--------------------------|
| Magnitude | Very high (4) | Medium (2) |
| Reversibility | Barely reversible (3) | Partly reversible (2) |
| Irreplaceable loss of resources | Significant loss (3) | Marginal loss (2) |
| Cumulative impact | High cumulative effects (4), provided losses are compensated for. | |
| Significance | Negative high (68) | Negative low (26) |
| Can impacts be mitigated? | <p>The mitigation measures include:</p> <ul style="list-style-type: none"> • A fire-break should be constructed around the perimeter of the site prior to the commencement of the construction phase; • Contractor should ensure that open fires on the site for cooking or heating are not allowed except in designated areas; • Contractor to ensure that construction related activities that pose a potential fire risk, such as welding, are properly managed and are confined to areas where the risk of fires has been reduced. Measures to reduce the risk of fires include avoiding working in high wind conditions when the risk of fires is greater. In this regard special care should be taken during the high risk dry, windy winter months; • Contractor to provide adequate firefighting equipment on-site, including a fire fighting vehicle; • Contractor to provide fire-fighting training to selected construction staff; • No construction staff, with the exception of security staff, to be accommodated on site over night; • As per the conditions of the Code of Conduct, in the advent of a fire being caused by construction workers and or construction activities, the appointed contractors must compensate farmers for any damage caused to their farms. The contractor should also compensate the firefighting costs borne by farmers and local authorities. | |

OPERATIONAL PHASE

Direct impacts: During the operational phase the study area will serve as a mining area and the impacts are generally associated with soil erosion, change in land use, impacts associated with the, increase in storm water runoff, increased consumption of water, visual intrusion, the generation of general waste, leakage of hazardous materials, and the change in the sense of place. The operational phase will also have a direct positive impact through the provision of permanent employment opportunities and facilitating a positive economic growth. The abovementioned impacts are discussed in more detail below:

- **Soil erosion –**

The largest risk factor for soil erosion will be during the operational phase when the mining activity ensues, and soil is left bare until it is rehabilitated. Erosion will be localised within the site. This will ultimately lead to the irretrievable commitment of this resource. The measurable effect of reducing erosion by utilizing mitigation measures may reduce possible erosion significantly. The conditions of the EMP will be adhered to throughout the mining operation and commitment to rehabilitation is of paramount importance in order to obtain a closure certificate from DMRE.

| Soil erosion | Pre-mitigation impact rating | Post mitigation impact rating |
|---------------------------------|----------------------------------|-------------------------------|
| Status (positive or negative) | Negative | Negative |
| Extent | Local/Regional (2) | Site (1) |
| Probability | Definite (4) | Unlikely (1) |
| Duration | Medium term (2) | Medium term (2) |
| Magnitude | High (3) | Medium (2) |
| Reversibility | Barely reversible (3) | Completely reversible (1) |
| Irreplaceable loss of resources | Significant loss of resource (3) | Marginal loss of resource (2) |

| | | |
|---------------------------|---|--------------------------|
| Cumulative impact | Medium cumulative impact (3). Should these impacts occur, there will be a cumulative impact on the air and water resources in the study area in terms of pollution. | |
| Significance | Negative High (51) | Negative Low (20) |
| Can impacts be mitigated? | <p>Yes, to avoid soil erosion it will be a good practice to not remove all the vegetation at once but to only clear the area as it becomes necessary and to implement concurrent rehabilitation.</p> <ul style="list-style-type: none"> The following mitigation or management measures are provided: Implement an effective system of run-off control, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion. Monitor the area regularly after larger rainfall events to determine where erosion may be initiated and then mitigate by modifying the soil micro-topography and revegetation or soil erosion control efforts accordingly <p>Also refer to section (f) of the EMPr.</p> | |

- Change in land-use – The proposed 5ha area will be changed from natural to mining.

According to **Figure 20** and **Figure 21** the proposed area is covered by natural vegetation. The natural vegetation consists mostly of Low Shrublands and a small area of Grasslands according to the land use map.

There is an existing mine on Portion 90 of the farm Elandsfontein 34, please see the Google earth maps (**figure 22, figure 23** and **Appendix 5**).

| Change in land use | Pre-mitigation impact rating | Post mitigation impact rating |
|---------------------------------|--|-------------------------------|
| Status (positive or negative) | Negative | Negative |
| Extent | Local (2) | Local (2) |
| Probability | Definite (4) | Definite (4) |
| Duration | Medium term (2) | Short term (1) |
| Magnitude | High (3) | Medium (2) |
| Reversibility | Barely reversible (3) | Partly reversible (2) |
| Irreplaceable loss of resources | Significant loss of resource (3) | Marginal loss of resource (2) |
| Cumulative impact | Low cumulative effects (2) – the right holder should enter into a surface use agreement with the landowner to compensate for any financial losses. | |
| Significance | Negative medium (48) | Negative low (26) |
| Can impacts be mitigated? | <p>The proponent should establish a Rehabilitation Fund to be used to rehabilitate the area once the proposed facility has been decommissioned. The fund should be funded by revenue generated during the operational phase of the project. The motivation for the establishment of a Rehabilitation Fund is based on the experience in the mining sector where many mines on closure have not set aside sufficient funds for closure and decommissioning.</p> <p>Also refer to section (f) of the EMPr.</p> | |

- Generation of alternative land use income – Income generated through the proposed mining of Stone aggregate will provide the reserve enterprise with increased cash flow and rural livelihood.

There is an existing mine and a processing plant on a certain portion of Portion 90 of the farm Elandsfontein 34

| Increased consumption of water | Pre-mitigation impact rating | Post mitigation impact rating |
|--------------------------------|------------------------------|-------------------------------|
|--------------------------------|------------------------------|-------------------------------|

| | | |
|---------------------------------|--|-----------------------------|
| Status (positive or negative) | Positive | Positive |
| Extent | Local (2) | Local (2) |
| Probability | Definite (4) | Definite (4) |
| Duration | Medium term (2) | Medium term (2) |
| Magnitude | High (3) | High (3) |
| Reversibility | Completely reversible (1) | Completely reversible (1) |
| Irreplaceable loss of resources | No loss of resources (1) | No loss of resources (1) |
| Cumulative impact | Medium cumulative impact (3). | |
| Significance | Negative medium (39) | Negative medium (39) |
| Can impacts be mitigated? | Yes, management actions and mitigation measures related to the use of water are included in section (f) of the EMPr. | |

- Increase in storm water runoff – The development is likely to result in an increase in storm water run-off that needs to be managed to prevent soil erosion.

| Increase in storm water runoff | Pre-mitigation impact rating | Post mitigation impact rating |
|---------------------------------------|---|--------------------------------------|
| Status (positive or negative) | Negative | Negative |
| Extent | Local (2) | Site (1) |
| Probability | Probable (3) | Possible (2) |
| Duration | Long term (3) | Medium term (2) |
| Magnitude | High (3) | Medium (2) |
| Reversibility | Barely reversible (3) | Partly reversible (2) |
| Irreplaceable loss of resources | Significant loss of resource (3) | Marginal loss of resource (2) |
| Cumulative impact | Medium cumulative impact (3) - Should these impacts occur, there will be a cumulative impacts on the wider area. | |
| Significance | Negative high (51) | Negative low (24) |
| Can impacts be mitigated? | Yes. It is therefore important that all management actions and mitigation measures included in section (f) of the EMPr. are implemented to ensure that these impacts do not occur | |

- Increased consumption of water – Water will be used for dust suppression and the portable water supply for employees and workers.

| Increased consumption of water | Pre-mitigation impact rating | Post mitigation impact rating |
|---------------------------------------|--|--------------------------------------|
| Status (positive or negative) | Negative | Negative |
| Extent | Local (2) | Local (2) |
| Probability | Definite (4) | Definite (4) |
| Duration | Medium term (2) | Medium term (2) |
| Magnitude | Medium (2) | Medium (2) |
| Reversibility | Irreversible (4) | Irreversible (4) |
| Irreplaceable loss of resources | Significant loss of resources (3) | Marginal loss of resources (2) |
| Cumulative impact | Medium cumulative impacts (4) - An additional demand on water sources could result in a significant cumulative impact with regards to the availability of water. | |
| Significance | Negative medium (38) | Negative medium (36) |
| Can impacts be mitigated? | Yes, management actions and mitigation measures related to the use of water are included in section (f) of the EMPr. | |

- Generation of waste –Workers will be present on site from 6:00 – 18:00, Monday to Saturday. Sources of general waste will be waste food, packaging, paper, etc. General waste will be stored on the site and removed on a weekly basis by a contractor.

There is an existing mine and a processing plant on a certain portion of Portion 90 of the farm Elandsfontein 34

| Generation of waste | Pre-mitigation impact rating | Post mitigation impact rating |
|---------------------------------|--|-------------------------------|
| Status (positive or negative) | Negative | Negative |
| Extent | Site (1) | Site (1) |
| Probability | Probable (3) | Possible (2) |
| Duration | Medium term (2) | Medium term (2) |
| Magnitude | Medium (2) | Low (1) |
| Reversibility | Irreversible (4) | Irreversible (4) |
| Irreplaceable loss of resources | Marginal of resource (2) | No loss of resource (1) |
| Cumulative impact | Low cumulative impact (2) - An additional demand for landfill space could result in significant cumulative impacts if services become unstable or unavailable, which in turn would negatively impact on the local community. | |
| Significance | Negative low (28) | Negative low (12) |
| Can impacts be mitigated? | Yes, management actions related to waste management are included in section (f) of the EMP. | |

- Leakage of hazardous materials - The proposed mining activity will make use of machinery that use fuel and oil. Leakage of these oils and fuel can contaminate water supplies and must be prevented by constructing oil and diesel permeable bunds to ensure that any spills are suitably attenuated and not released into the environment.

| Leakage of hazardous materials | Pre-mitigation impact rating | Post mitigation impact rating |
|---------------------------------|--|-------------------------------|
| Status (positive or negative) | Negative | Negative |
| Extent | Local (2) | Site (1) |
| Probability | Possible (2) | Unlikely (1) |
| Duration | Long term (3) | Short term (1) |
| Magnitude | High (3) | Medium (2) |
| Reversibility | Barely reversible (3) | Partly reversible (2) |
| Irreplaceable loss of resources | Significant loss of resources (3) | Marginal loss of resource (2) |
| Cumulative impact | High cumulative impacts (4) if impact occurs and not mitigated. | |
| Significance | Negative high (51) | Negative low (22) |
| Can impacts be mitigated? | Yes. It is therefore important that all management actions and mitigation measures included in the section (f) of EMP are implemented to ensure that these impacts do not occur. | |

- Noise disturbance - Mining activities will result in the generation of noise over a period of 3-5 years. Sources of noise are likely to include vehicles, blasting, the use of machinery such as backactors, crushers and screeners and people working on the site, but mining activities should be limited to normal working days and some Saturdays and hours (6:00 – 18:00) if possible.

Please note there is an existing mine and a processing plant on a certain portion of Portion 90 of the farm Elandsfontein 34 using the same mining method as this application. Thus noise impact is expected to be the same from the past few years.

| Temporary noise disturbance | Pre-mitigation impact rating | Post mitigation impact rating |
|-------------------------------|------------------------------|-------------------------------|
| Status (positive or negative) | Negative | Negative |
| Extent | Site (1) | Site (1) |
| Probability | Definite (4) | Possible (2) |
| Duration | Medium term (2) | Medium term (2) |
| Magnitude | Medium (2) | Medium (2) |
| Reversibility | Completely reversible (1) | Completely reversible (1) |

| | | |
|---------------------------------|---|--------------------------|
| Irreplaceable loss of resources | Marginal loss (2) | Marginal loss (2) |
| Cumulative impact | Medium cumulative impact (3). | |
| Significance | Negative low (26) | Negative low (22) |
| Can impacts be mitigated? | Yes, management actions related to noise pollution are included in section (f) of the EMPr. | |

- **Blasting** – Mining process will include blasting activities

| Generation of waste | Pre-mitigation impact rating | Post mitigation impact rating |
|---------------------------------|--|----------------------------------|
| Status (positive or negative) | Negative | Negative |
| Extent | Local/district (2) | Local/district (2) |
| Probability | Definite (4) | Probable (3) |
| Duration | Medium term (2) | Medium term (2) |
| Magnitude | Very high (4) | Medium (2) |
| Reversibility | Irreversible reversible (4) | Barely reversible (3) |
| Irreplaceable loss of resources | Significant loss of resource (3) | Significant loss of resource (3) |
| Cumulative impact | High cumulative impact (4) | |
| Significance | Negative very high (76) | Negative medium (34) |
| Can impacts be mitigated? | Yes, blasting must be controlled in the vicinity of roads. <ul style="list-style-type: none"> • <i>It is recommended not to blast too early in the morning when it is still cool or when there is a possibility of an atmospheric inversion layer or too late in the afternoon in winter.</i> • <i>Do not blast in fog or in the dark. Refrain from blasting when the wind is blowing strongly in the direction of an outside receptor.</i> • <i>Do not blast with low overcast clouds.</i> | |

Indirect impacts: The operational phase will have an indirect negative impact through the change in the sense of place and an indirect positive impact through the provision of additional electrical infrastructure.

- **Potential impact on tourism** – There are no tourist facilities in close proximity to the proposed area.

There is an existing mine and a processing plant on a certain portion of Portion 90 of the farm Elandsfontein 34

| Potential impacts on tourism | Pre-mitigation impact rating | Post mitigation impact rating |
|---------------------------------|-------------------------------|-------------------------------|
| Status (positive or negative) | Negative | Negative |
| Extent | Site (1) | Site (1) |
| Probability | Unlikely (1) | Unlikely (1) |
| Duration | Medium term (2) | Medium term (2) |
| Magnitude | Low (1) | Low (1) |
| Reversibility | Completely reversible (1) | Completely reversible (1) |
| Irreplaceable loss of resources | No loss of resources (1) | No loss of resources (1) |
| Cumulative impact | Medium cumulative impacts (3) | |
| Significance | Negative low (9) | Negative low (9) |
| Can impacts be mitigated? | No mitigation required | |

DECOMMISSIONING PHASE (MINE CLOSURE AND REHABILITATION)

Direct impacts: Typically, the major social impacts associated with the decommissioning phase are linked to the loss of jobs and associated income. This has implications for the households who are directly affected, the communities within which they live. If infrastructures are removed after a 3/5 year period, the site will be returned to its natural state. Therefore, the physical environment will benefit from the closure of the mining area.

- Rehabilitation of the physical environment – The physical environment will benefit from the closure of the mining area. Rehabilitation should be done as far as possible by slopping the area.

Rehabilitation activities will be:

- The pit edges will be sloped with any waste rock and unused overburden to a safe gradient.
- Slopes that have overburden coverage will be revegetated.
- Any remaining unusable waste rocks and overburden (if any) will be placed into the pit to partly fill voids.

| Rehabilitation of the physical environment | Pre-mitigation impact rating | Post mitigation impact rating |
|--|--|-------------------------------|
| Status (positive or negative) | Positive | Positive |
| Extent | Site (1) | Site (1) |
| Probability | Possible (2) | Definite (4) |
| Duration | Permanent (4) | Permanent (4) |
| Magnitude | Very High (4) | Very High (4) |
| Reversibility | N/A | N/A |
| Irreplaceable loss of resources | N/A | N/A |
| Cumulative impact | The impact would result in negligible to no cumulative effects (1) | |
| Significance | Positive medium (32) | Positive medium (40) |
| Can impacts be mitigated? | No mitigation measures required. | |

- Loss of employment - The decommissioning of the facility has the potential to have a negative social impact on the local community as it will create job losses.

| Loss of employment | Pre-mitigation impact rating | Post mitigation impact rating |
|---------------------------------|--|-------------------------------|
| Status (positive or negative) | Negative | Negative |
| Extent | Local (2) | Local (2) |
| Probability | Probable (3) | Probable (3) |
| Duration | Permanent (4) | Permanent (4) |
| Magnitude | Medium (2) | Medium (2) |
| Reversibility | Irreversible (4) | Irreversible (4) |
| Irreplaceable loss of resources | No loss of resource (1) | No loss of resource (1) |
| Cumulative impact | Medium cumulative impacts (3) | |
| Significance | Negative medium (34) | Negative medium (34) |
| Can impacts be mitigated? | <p>The following mitigation measures are recommended:</p> <ul style="list-style-type: none"> • All structures and infrastructure associated with the proposed facility should be dismantled and transported off-site on decommissioning; • GCG Crushers CC should establish an Environmental Rehabilitation Trust Fund to cover the costs of decommissioning and rehabilitation of disturbed areas. | |

Indirect impacts: No indirect impacts are anticipated from the decommissioning phase of the proposed development.

vi) **METHODOLOGY USED IN DETERMINING AND RANKING THE NATURE, SIGNIFICANCE, CONSEQUENCES, EXTENT, DURATION AND PROBABILITY OF POTENTIAL ENVIRONMENTAL IMPACTS AND RISKS**

Method of environmental assessment

The environmental assessment aims to identify the various possible environmental impacts that could result from the proposed development. Different impacts need to be evaluated in terms of their significance and in doing so highlight the most critical issues to be addressed.

Significance is determined through a synthesis of impact characteristics which include context and intensity of an impact. Context refers to the geographical scale i.e. site, local, national or global whereas intensity is defined by the severity of the impact e.g. the magnitude of deviation from background conditions, the size of the area affected, the duration of the impact and the overall probability of occurrence. Significance is calculated as shown in the Table below.

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 total number of points scored for each impact indicates the level of significance of the impact.

Impact Rating System

Impact assessment must take account of the nature, scale and duration of impacts on the environment whether such impacts are positive or negative. Each impact is also assessed according to the following project phases:

- Construction
- Operation
- Decommissioning

Where necessary, the proposal for mitigation or optimisation of an impact should be detailed. A brief discussion of the impact and the rationale behind the assessment of its significance should also be included. The rating system is applied to the potential impacts on the receiving environment and includes an objective evaluation of the mitigation of the impact. In assessing the significance of each impact the following criteria is used:

Table: The rating system

| NATURE | | |
|--|----------------------------|---|
| Include a brief description of the impact of environmental parameter being assessed in the context of the project. This criterion includes a brief written statement of the environmental aspect being impacted upon by a particular action or activity. | | |
| GEOGRAPHICAL EXTENT | | |
| This is defined as the area over which the impact will be experienced. | | |
| 1 | Site | The impact will only affect the site. |
| 2 | Local/district | Will affect the local area or district. |
| 3 | Province/region | Will affect the entire province or region. |
| 4 | International and National | Will affect the entire country. |
| PROBABILITY | | |
| This describes the chance of occurrence of an impact. | | |
| 1 | Unlikely | The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence). |
| 2 | Possible | The impact may occur (Between a 25% to 50% chance of occurrence). |

| | | |
|---|-----------------------|--|
| 3 | Probable | The impact will likely occur (Between a 50% to 75% chance of occurrence). |
| 4 | Definite | Impact will certainly occur (Greater than a 75% chance of occurrence). |
| DURATION | | |
| This describes the duration of the impacts. Duration indicates the lifetime of the impact as a result of the proposed activity. | | |
| 1 | Short term | The impact will either disappear with mitigation or will be mitigated through natural processes in a span shorter than the construction phase (0 – 1 years), or the impact will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years). |
| 2 | Medium term | The impact will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years). |
| 3 | Long term | The impact and its effects will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter (10 – 30 years). |
| 4 | Permanent | The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered indefinite. |
| INTENSITY/ MAGNITUDE | | |
| Describes the severity of an impact. | | |
| 1 | Low | Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible. |
| 2 | Medium | Impact alters the quality, use and integrity of the system/component but system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity). |
| 3 | High | Impact affects the continued viability of the system/ component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation. |
| 4 | Very high | Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired. Rehabilitation and remediation often impossible. If possible rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation. |
| REVERSIBILITY | | |
| This describes the degree to which an impact can be successfully reversed upon completion of the proposed activity. | | |
| 1 | Completely reversible | The impact is reversible with implementation of minor mitigation measures. |
| 2 | Partly reversible | The impact is partly reversible but more intense mitigation measures are required. |
| 3 | Barely reversible | The impact is unlikely to be reversed even with intense mitigation measures. |
| 4 | Irreversible | The impact is irreversible and no mitigation measures exist. |
| IRREPLACEABLE LOSS OF RESOURCES | | |
| This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity. | | |
| 1 | No loss of resource | The impact will not result in the loss of any resources. |

| | | |
|---|-------------------------------|--|
| 2 | Marginal loss of resource | The impact will result in marginal loss of resources. |
| 3 | Significant loss of resources | The impact will result in significant loss of resources. |
| 4 | Complete loss of resources | The impact is result in a complete loss of all resources. |
| CUMULATIVE EFFECT | | |
| This describes the cumulative effect of the impacts. A cumulative impact is an effect which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from other similar or diverse activities as a result of the project activity in question. | | |
| 1 | Negligible cumulative impact | The impact would result in negligible to no cumulative effects. |
| 2 | Low cumulative impact | The impact would result in insignificant cumulative effects. |
| 3 | Medium cumulative impact | The impact would result in minor cumulative effects. |
| 4 | High cumulative impact | The impact would result in significant cumulative effects |
| 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 calculation of the significance of an impact uses the following formula: | | |
| (Extent + probability + reversibility + irreplaceability + duration + cumulative effect) x magnitude/intensity. | | |
| The summation of the different criteria will produce a non-weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating. | | |
| Points | Impact significance rating | Description |
| 6 to 28 | Negative low impact | The anticipated impact will have negligible negative effects and will require little to no mitigation. |
| 6 to 28 | Positive low impact | The anticipated impact will have minor positive effects. |
| 29 to 50 | Negative medium impact | The anticipated impact will have moderate negative effects and will require moderate mitigation measures. |
| 29 to 50 | Positive medium impact | The anticipated impact will have moderate positive effects. |
| 51 to 73 | Negative high impact | The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact. |
| 51 to 73 | Positive high impact | The anticipated impact will have significant positive effects. |
| 74 to 96 | Negative very high impact | The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws". |
| 74 to 96 | Positive very high impact | The anticipated impact will have highly significant positive effects. |

vii) THE POSITIVE AND NEGATIVE IMPACTS THAT THE PROPOSED ACTIVITY (IN TERMS OF THE INITIAL SITE LAYOUT) AND ALTERNATIVES WILL HAVE ON THE ENVIRONMENT AND THE COMMUNITY THAT MAY BE AFFECTED.

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

| NEGATIVE IMPACTS |
|---|
| Increased ambient noise levels resulting from mining activities and blasting. |
| Increased traffic movement of trucks, moving ore bodies to the crushing area. |
| Potential water and soil pollution impacts resulting from hydrocarbon spills and soil erosion which may impact on environmental resources utilized by communities, landowners and other stakeholders. |
| Increased vehicle activity within the area resulting in the possible destruction and disturbance of fauna and flora. |
| Influx of persons (job seekers) to site as a result of increased activity and the possible resultant increase in opportunistic crime. |
| Longterm loss of high potential soil for agricultural land. |
| Airpollution due to dust to the surrounding community |
| POSITIVE IMPACTS |
| Temporary employment |
| Economic benefits |

viii) THE POSSIBLE MITIGATION MEASURES THAT COULD BE APPLIED AND THE LEVEL OF RISK.

(With regard to the issues and concerns raised by affected parties provide a list of the issues raised and an assessment/ discussion of the mitigations or site layout alternatives available to accommodate or address their concerns, together with an assessment of the impacts or risks associated with the mitigation or alternatives considered).

Negative impacts on vegetation, soil and the water resources associated with the mining activity have been identified through the BAR & EMPr process. Mitigation measures as set out in the Environmental Management Programme (EMPr) attached in Part B must be implemented in order to minimise these potential impacts.

Noise and Vibration

The possible noise and increased ground vibration during blasting and mine activities can however be controlled by means of approved acoustic screening measures, state of the art equipment, proper noise management principles, compliance to the Local Noise Regulations, and the International Finance Corporation's Environmental Health and Safety Guidelines.

The following three primary variables should be considered when designing acoustic screening measures for the control of sound and/or noise:

- The source – Reduction of noise at the source;
- The transmission path – Reduction of noise between the source and the receiver;
- The receiver – Reduction of the noise at the receiver.

The last option is not applicable as it was decided to control the noise levels at the source.

Construction phase

- Machinery with low noise levels that complies with the manufacturer's specifications to be used
- Activities to take place during daytime period only.
- Noise monitoring on a quarterly basis.
- Crack survey at the abutting residential areas to be carried out once the mine lay-out plan is made available.

Operational phase

- Emergency generators to be placed in such a manner that it is 500m away from any residential area.
- Drilling with drilling rig to be done in such a manner and must be 500m away from any residential area.
- Noise monitoring to be done on a quarterly basis.
- Crushing activities to be monitored and noise survey to be done on a monthly basis after which the frequency can change to a quarterly basis.

- Blasting to take place under controlled conditions and by using the safe blasting methods at all times.
- A distance of 500m must be at all times maintained between the residential area, and the blast site and an earth berm of 10.0m to be erected in the vicinity of residential properties.
- A safe distance to be maintained at the OHP during blasting activities.
- Blasting activities to be monitored and ground vibration and noise survey to be done on a monthly basis after which the frequency can change to a quarterly basis.
- The feeder roads to be closed for traffic during blasting if required.
- Permanent ground vibration to be carried out at the abutting noise sensitive areas if required.
- Crushing activities to be monitored and noise survey to be done on a monthly basis after which the frequency can change to a quarterly basis.

Rehabilitation phase

- Machinery with low noise levels which complies with the manufacturer's specifications to be used.
- Activities to take place during daytime period only.
- Noise monitoring on a quarterly basis.

Cumulative impact of the entire process

Actively manage the process and noise and vibration impact assessment to determine compliance to the noise and vibration regulations and/or standards.

The following are the Environmental, Health and Safety Guidelines of the IFC of the World Bank, which should be taken into consideration during the construction, operational and rehabilitation phases of the project:

- Selecting equipment with lower sound power levels;
- Installing silencers for fans;
- Installing suitable mufflers on engine exhausts and compressor components;
- Installing acoustic enclosures for equipment causing radiating noise;
- Installing vibration isolation for mechanical equipment;
- Re-locate noise sources to areas that are less noise sensitive, to take advantage of distance and natural shielding;
- Taking advantage during the design stage of natural topography as a noise buffer;
- Develop a mechanism to record and respond to complaints.

Blasts must be designed in such a manner that ground vibration and over pressure levels are adhered to. In order to comply with the above, the following measures should be implemented:

- A scheme of vibration and air over pressure monitoring to be implemented;
- A scheme by which air over pressure is controlled;
- Days and times of blasting operations to be established;
- Ensure that the correct design relationship exists between burden, spacing and hole diameter;
- Ensure the maximum amount of explosive on any one-day delay interval, the maximum instantaneous charge, is optimized by considering;
- Reduce the number of holes per detonator delay interval;
- Reduce the instantaneous charge by in-hole delay techniques;
- Reduce the bench height or hole depth;
- Reduce the borehole diameter.

Always attempt to minimize the resulting environmental effects of blasting operations and to recognize the fact that the perception of blasting events occurs at levels of vibration well below those necessary for the possible onset of the most cosmetic of damage; but nevertheless at levels that can concern occupants abutting the mining area;

Be aware that relatively small changes in blast design can produce noticeable differences in environmental emissions and that it is very often in response to changes in these emissions rather than their absolute value that complaints may be made.

Scheme of vibration monitoring may include the following:

- The location and number of monitoring points;

- The type of equipment to be used and the parameters to be measured;
- The frequency of monitoring;
- The method by which such data are made available to management;
- The method by which such data are used in order to ensure that the site vibration limit is not exceeded and to mitigate any environmental effects of blasting.

Visual impact

Dust suppression measures must be implemented.

Soil

- Disturbances to soil should be limited as far as possible.
- Erosion control measures should be implemented if necessary.
- Oils and lubricants must be stored in lined containment structures.
- Drip trays should be used where necessary.
- Waste bins should be provided and waste should be removed and disposed of at a licensed landfill site.
- Rehabilitation should be done as far as possible by slopping the area

Water

- Before any water is abstracted, a geo-hydro study should be conducted in order to determine the specific yield.
- Oils and lubricants must be stored in lined containment structures.
- Drip trays should be used where necessary.
- Erosion control measures should be implemented if necessary.

ix) MOTIVATION WHERE NO ALTERNATIVE SITES WERE CONSIDERED.

As discussed in the previous section, the possibility to encounter further Stone Aggregate on a certain 5ha portion of Portion 90 of the farm Elandsfontein 34, Registration Division: IP, North West province, was identified.

x) STATEMENT MOTIVATING THE ALTERNATIVE DEVELOPMENT LOCATION WITHIN THE OVERALL SITE. (Provide a statement motivating the final site layout that is proposed)

The site is preferred due to its possibility of having Stone Aggregate. The proposed 5ha can be used for livestock grazing but it is not being utilized. There is also an existing mine and a processing plant on a certain portion of Portion 90 of the farm Elandsfontein 34

I) FULL DESCRIPTION OF THE PROCESS UNDERTAKEN TO IDENTIFY, ASSESS AND RANK THE IMPACTS AND RISKS THE ACTIVITY WILL IMPOSE ON THE PREFERRED SITE (IN RESPECT OF THE FINAL SITE LAYOUT PLAN) THROUGH THE LIFE OF THE ACTIVITY.

- A description of all environmental issues and risks that are identified during the environmental impact assessment process**

Process for the identification of key issues

The methodology for the identification of key issues aims, as far as possible, to provide a user-friendly analysis of information to allow for easy interpretation.

- **Checklist:** The checklist consists of a list of structured questions related to the environmental parameters and specific human actions. They assist in ordering thinking, data collection, presentation and alert against the omission of possible impacts.
- **Matrix:** The matrix analysis provides a holistic indication of the relationship and interaction between the various activities, development phases and the impact thereof on the environment. The method aims at providing a first order cause and effect relationship between the environment and the proposed activity. The matrix is designed to indicate the relationship between the different stressors and receptors which leads to specific impacts. The matrix also indicates the specialist studies, which will be submitted as part of the Environmental Impact Report in order to address the potentially most significant impacts.

Checklist analysis

The site visit was conducted to ensure a proper analysis of the site specific characteristics of the study area. The table below provides a checklist, which is designed to stimulate thought regarding possible consequences of specific actions and so assist scoping of key issues. It consists of a list of structured questions related to the environmental parameters and specific human actions. They assist in ordering thinking, data collection, presentation and alert against the omission of possible impacts. The table highlights certain issues, which are further analysed in matrix format.

Table: Environmental checklist

| QUESTION | YES | NO | Un-sure | Description |
|---|-----|----|---------|---|
| 1. Are any of the following located on the site earmarked for the development? | | | | |
| I. A river, stream, dam or wetland | | × | | None. |
| II. A conservation or open space area | | × | | None. |
| III. An area that is of cultural importance | | | × | According to the DEA Screening Report the area falls within low Archaeological and Cultural Heritage Theme Sensitivity (Appendix 7). |
| IV. Site of geological significance | | | × | According to the DEA Screening Report the proposed area falls within very high Paleontology Theme Sensitivity (Appendix 7). |
| V. Areas of outstanding natural beauty | | × | | |
| VI. Highly productive agricultural land | | × | | According to the Land Capability map the proposed area and surrounding area also falls within Land in Class VI (6). There is also an existing mine on Portion 90 of the farm Elandsfontein 34. The proposed 5ha is not used for any agriculture related activities. |
| VII. Floodplain | | × | | |
| VIII. Indigenous forest | | × | | |
| IX. Grass land | × | | | According to the land use map the proposed area is mostly covered in Low shrubland and a very small area in Grasslands (Appendix 5). |
| X. Bird nesting sites | | × | | According to the Important Bird Areas map (Appendix 7) the proposed area does not fall within an Important |
| XI. Red data species | | | × | There area is covered in natural vegetation. |
| XII. Tourist resort | | × | | None. |

| 2. Will the project potentially result in potential? | | | | |
|--|---|---|---|---|
| I. Removal of people | | × | | None. |
| II. Visual Impacts | × | | | The visual impact will be managed |
| III. Noise pollution | × | | | The noise impact will be limited to working hours. |
| IV. Construction of an access road | | × | | Access will be obtained from existing gravel roads off the R503. |
| V. Risk to human or valuable ecosystems due to explosion/fire/ discharge of waste into water or air. | × | | | Blasting will occur and be managed. |
| VI. Accumulation of large workforce (>50 manual workers) into the site. | | × | | Employment opportunities will be created during the construction and operational phase of the project. |
| VII. Utilisation of significant volumes of local raw materials such as water, wood etc. | | × | | Water will be used for dust suppression. |
| VIII. Job creation | × | | | Employment opportunities will be created during the construction and operational phase of the project. |
| IX. Traffic generation | | × | | None. |
| X. Soil erosion | | × | | Only areas earmarked for mining will be cleared. The mining will be phased, and the topsoil stockpiled separately. Concurrent rehabilitation will take place. |
| XI. Installation of additional bulk telecommunication transmission lines or facilities | | × | | None. |
| 3. Is the proposed project located near the following? | | | | |
| I. A river, stream, dam or wetland | | × | | None. |
| II. A conservation or open space area | | × | | None. |
| III. An area that is of cultural importance | | | × | |
| IV. A site of geological significance | | | × | |
| V. An area of outstanding natural beauty | | × | | |
| VI. Highly productive agricultural land | | | × | According to the Land Capability map the proposed area and surrounding area also falls within Land in Class VI (6). |
| VII. A tourist resort | | × | | None. |
| VIII. A formal or informal settlement | × | | | There are homesteads in the surrounding area, more than 800m from the proposed 5ha area. |

Matrix analysis

The matrix describes the relevant listed activities, the aspects of the development that will apply to the specific listed activity, a description of the environmental issues and potential impacts, the significance and magnitude of the potential impacts, and the mitigation of the potential impacts. The matrix also highlights areas of particular concern, which requires more in depth assessment. Each cell is evaluated individually in terms of the nature of the impact, duration and its significance – should no mitigation measures be applied. This is important since many impacts would not be considered insignificant if proper mitigation measures were implemented. The matrix also provides an indication if mitigation measures are available.

In order to conceptualise the different impacts the matrix specify the following:

- **Stressor:** Indicates the aspect of the proposed activity, which initiates and cause impacts on elements of the environment.
- **Receptor:** Highlights the recipient and most important components of the environment affected by the stressor.
- **Impacts:** Indicates the net result of the cause-effect between the stressor and receptor.
- **Mitigation:** Impacts need to be mitigated to minimise the effect on the environment.

J) AN ASSESSMENT OF EACH IDENTIFIED POTENTIALLY SIGNIFICANT IMPACT AND RISK

| LISTED ACTIVITY (The Stressor) | ASPECTS OF THE DEVELOPMENT /ACTIVITY | POTENTIAL IMPACTS | | | SIGNIFICANCE AND MAGNITUDE OF POTENTIAL IMPACTS | | | MITIGATION OF POTENTIAL IMPACTS | SPECIALIST STUDIES / INFORMATION |
|--|---|-------------------------|---|--|--|-------|----------|---------------------------------------|-------------------------------------|
| | | Receptors | Impact description | | Minor | Major | Duration | Possible Mitigation | |
| CONSTRUCTION PHASE | | | | | | | | | |
| <p>Listing Notice 1, GNR 327, Activity 27:"The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation."</p> <p>Listing Notice 3 (GNR 324), Activity 4: "The development of a road wider than 4 metres with a reserve less than 13,5 metres. (h): North West: (iv) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority; (vi) Areas within 5 kilometres from protected areas identified in terms of NEMPAA or from a biosphere reserve.</p> <p>Listing Notice 3 (GNR 324), Activity 12: The clearance of an area of 300 square metres or more of indigenous vegetation (h) North West: (iv) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority;</p> | <p>Site clearing and preparation</p> <p>Areas earmarked for prospecting will need to be cleared, topsoil will be stockpiled separately.</p> | BIOPHYSICAL ENVIRONMENT | Fauna & Flora | <ul style="list-style-type: none">Loss or fragmentation of indigenous natural vegetation.Loss of sensitive species.Loss or fragmentation of habitats. | - | | S | Yes | - |
| | | | Air | <ul style="list-style-type: none">Air pollution due to the increase of traffic.Dust from mining/prospecting activities | - | | M | Yes | - |
| | | | Soil | <ul style="list-style-type: none">Soil degradation, including erosion.Loss of topsoil.Disturbance of soils and existing land use (soil compaction). | - | - | S | Yes | - |
| | | | Geology | <ul style="list-style-type: none">It is not foreseen that the removal of indigenous vegetation will impact on the geology or vice versa. | - | | S | Yes | - |
| | | | Existing services infrastructure | <ul style="list-style-type: none">Generation of waste that need to be accommodated at a licensed landfill site.Generation of sewage that need to be accommodated by the local sewage plant. | - | | S | Yes | - |
| | | | Ground water | <ul style="list-style-type: none">Pollution due to construction vehicles. | - | | S | Yes | - |
| | | | Surface water | <ul style="list-style-type: none">Increase in storm water run-off.Pollution of water sources due to soil erosion.Destruction of watercourses (pans/dams/streams/wetlands). | - | | S | Yes | - |
| | | Visual landscape | <ul style="list-style-type: none">Potential visual impact on residents of farmsteads and motorists in close proximity to proposed facility. | - | | L | Yes | - | |
| | | Traffic volumes | <ul style="list-style-type: none">Increase in construction vehicles. | - | | S | Yes | - | |
| | | Health & Safety | <ul style="list-style-type: none">Air/dust pollution.Road safety.Increased risk of veld fires. | - | | S | Yes | - | |
| | | Noise levels | <ul style="list-style-type: none">The generation of noise as a result of construction vehicles, the use of machinery such as drills, excavators, dumper trucks, people working on the site, etc. | - | | L | Yes | - | |
| | | Tourism industry | <ul style="list-style-type: none">Since there are no tourism facilities in close proximity to the site, the construction activities will not have an impact on tourism in the area. | N/A | N/A | N/A | N/A | - | |
| | | Heritage resources | <ul style="list-style-type: none">Removal or destruction of archaeological and/or paleontological sites.Removal or destruction of buildings, structures, places and equipment of cultural significance.Removal or destruction of graves, cemeteries and burial grounds. | - | | L | Yes | - | |
| OPERATIONAL PHASE | | | | | | | | | |

| | | | | | | | | | | |
|---|--|-------------------------|----------------------------------|--|--|-----|-----|-----|-----|---|
| <p>Listing Notice 1 (GNR 327) as amended (GNR 517), Activity 21: “Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity as contained in this Listing Notice on in Listing Notice 3 of 2014, required to exercise the mining permit”</p> <p>NEM:WA 59 of 2008: Residue stockpiles or residue deposits, Category A: (15): The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a prospecting right or mining permit, in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).</p> | <p>The key components of the proposed project are described below:</p> <ul style="list-style-type: none">• <u>Supporting Infrastructure</u> - A control facility with basic services such as water and electricity will be constructed on the site and will have an approximate footprint 50m² or less. Other supporting infrastructure includes a site office and workshop area.• <u>Roads</u> – Access will be obtained from an existing gravel roads off the N7.• <u>Fencing</u> - For health, safety and security reasons, the facility will be required to be fenced off from the surrounding farm. | BIOPHYSICAL ENVIRONMENT | Fauna & Flora | <ul style="list-style-type: none">• Fragmentation of habitats.• Establishment and spread of declared weeds and alien invader plants (operations). | | - | L | Yes | - | |
| | | | Air quality | <ul style="list-style-type: none">• Air pollution due to the mining / prospecting activity and transport of the gravel to the designated areas. | - | | S | Yes | - | |
| | | | Soil | <ul style="list-style-type: none">• Soil degradation, including erosion.• Disturbance of soils and existing land use (soil compaction).• Loss of agricultural potential (low significance relative to agricultural potential of the site). | - | | L | Yes | - | |
| | | | Geology | <ul style="list-style-type: none">• Collapsible soil.• Seepage (shallow water table).• Active soil (high soil heave).• Erodible soil.• The presence of undermined ground.• Instability due to soluble rock.• Steep slopes or areas of unstable natural slopes.• Areas subject to seismic activity.• Areas subject to flooding. | - | | L | Yes | - | |
| | | | Existing services infrastructure | <ul style="list-style-type: none">• Generation of waste that need to be accommodated at a licensed landfill site.• Generation of sewage that need to be accommodated by the municipal sewerage system and the local sewage plant.• Increased consumption of water, dust suppression. | - | | L | Yes | - | |
| | | | Ground water | <ul style="list-style-type: none">• Leakage of hazardous materials. The machinery on site require oils and fuel to function. Leakage of these oils and fuels can contaminate water supplies.• Pollution due to blasting | | - | L | Yes | - | |
| | | | Surface water | <ul style="list-style-type: none">• Increase in storm water runoff. The development will potentially result in an increase in storm water run-off that needs to be managed to prevent soil erosion.• Destruction of watercourses (pans/dams/streams/wetlands).• Leakage of hazardous materials. The machinery on site require oils and fuel to function. Leakage of these oils and fuels can contaminate water supplies. | - | | L | Yes | - | |
| | | | SOCIAL/ECONOMIC ENVIRONMENT | Local unemployment rate | <ul style="list-style-type: none">• Job creation. Security guards will be required for 24 hours every day of the week.• Skills development. | - | | L | Yes | - |
| | | Visual landscape | | <ul style="list-style-type: none">• The proposed 5ha area is not used for any agriculture related activities. | - | | L | Yes | - | |
| | | Traffic volumes | | <ul style="list-style-type: none">• Increase in vehicles collecting gravel for distribution. | - | | S | Yes | - | |
| | | Health & Safety | | <ul style="list-style-type: none">• Air/dust pollution.• Road safety. | - | | S | Yes | - | |
| | | Noise levels | | <ul style="list-style-type: none">• The proposed development will result in noise pollution during the operational phase. | - | | M | Yes | - | |
| | | Tourism industry | | <ul style="list-style-type: none">• Since there are tourism facilities in close proximity to the site, the decommissioning activities may have an impact on tourism in the area. | N/A | N/A | N/A | N/A | - | |
| | | Heritage resources | | <ul style="list-style-type: none">• It is not foreseen that the proposed activity will impact on heritage resources or vice versa. | N/A | N/A | N/A | N/A | - | |
| DECOMMISSIONING PHASE | | | | | | | | | | |

| | | | | | | | | | |
|---|--|-----------------------------|----------------------------------|--|-----|-----|-----|-----|---|
| - | <p><u>Mine closure</u> During the mine closure the Mine and its associated infrastructure will be dismantled.</p> <p><u>Rehabilitation of biophysical environment</u> The biophysical environment will be rehabilitated.</p> | BIOPHYSICAL ENVIRONMENT | Fauna & Flora | <ul style="list-style-type: none"> Re-vegetation of exposed soil surfaces to ensure no erosion in these areas. | + | | L | Yes | - |
| | | | Air quality | <ul style="list-style-type: none"> Air pollution due to the increase of traffic of construction vehicles. | - | | S | Yes | - |
| | | | Soil | <ul style="list-style-type: none"> Backfilling of all voids Placing of topsoil on backfilled area Sloping of the open pit | + | | L | Yes | - |
| | | | Geology | <ul style="list-style-type: none"> It is not foreseen that the decommissioning phase will impact on the geology of the site or vice versa. | N/A | N/A | N/A | N/A | - |
| | | | Existing services infrastructure | <ul style="list-style-type: none"> Generation of waste that need to be accommodated at the local landfill site. Generation of sewage that need to be accommodated by the municipal sewerage system and the local sewage plant. Increase in construction vehicles. | - | | S | Yes | - |
| | | | Ground water | <ul style="list-style-type: none"> Pollution due to construction vehicles. | - | | S | Yes | - |
| | | | Surface water | <ul style="list-style-type: none"> Increase in storm water run-off. Pollution of water sources due to soil erosion. Destruction of watercourses (pans/dams/streams/wetlands). | - | | S | Yes | - |
| | | SOCIAL/ECONOMIC ENVIRONMENT | Local unemployment rate | <ul style="list-style-type: none"> Loss of employment. | - | | L | Yes | - |
| | | | Visual landscape | <ul style="list-style-type: none"> Potential visual impact on visual receptors in close proximity to proposed facility. | - | | S | Yes | - |
| | | | Traffic volumes | <ul style="list-style-type: none"> Increase in construction vehicles. | - | | S | Yes | - |
| | | | Health & Safety | <ul style="list-style-type: none"> Air/dust pollution. Road safety. Increased crime levels. The presence of mine workers on the site may increase security risks associated with an increase in crime levels as a result of influx of people in the rural area. | - | | L | Yes | - |
| | | | Noise levels | <ul style="list-style-type: none"> The generation of noise as a result of construction vehicles, the use of machinery and people working on the site. | - | | S | Yes | - |
| | | | Tourism industry | <ul style="list-style-type: none"> Since there are no tourism facilities in close proximity to the site, the decommissioning activities will not have an impact on tourism in the area. | N/A | N/A | N/A | N/A | - |
| | | | Heritage resources | <ul style="list-style-type: none"> It is not foreseen that the decommissioning phase will impact on any heritage resources. | - | | L | Yes | - |

(N/A) No impact (+) Positive Impact (-) Negative Impact (S) Short Term (M) Medium Term (L) Long Term

K) WHERE APPLICABLE, A SUMMARY OF THE FINDINGS AND IMPACTS MANAGEMENT MEASURES IDENTIFIED IN AN SPECIALIST REPORT COMPLYING WITH APPENDIX 6 OF THESE REGULATIONS AND AN INDICATION AS TO HOW THESE FINDINGS AND RECOMMENDATIONS HAVE BEEN INCLUDED IN THE FINAL REPORT;

| LIST OF STUDIES UNDERTAKEN | RECOMMENDATIONS OF SPECIALIST REPORTS | SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable) | REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED. |
|----------------------------|---------------------------------------|---|--|
| | | | |

According to the DEA Screening Report, nine (9) specialist assessments have been identified for inclusion in the assessment report. Please see the table below for the list of these studies and also our response. Please refer to **Appendix 7**.

| Specialist study according to DEA Screening tool | | Response |
|--|---|--|
| Agriculture Impact Assessment | | <p>According to the DEA Screening Report the Agriculture theme sensitivity of the proposed 5ha area fall within medium sensitivity.</p> <p>The land capability for the proposed area and surrounding area also falls withing Land in Class VI (6).</p> <p>According to Figure 20 and Figure 21 the proposed area is covered by natural vegetation. The natural vegetation consists mostly of Low Shrublands and a small area of Grasslands according to the land use map.</p> <p>There is an existing mine on Portion 90 of the farm Elandsfontein 34, please see the Google earth maps (figure 22, figure 23 and Appendix 5).</p> <p>We do not see a need for this study as the proposed area is not used for any activities including agriculture / livestock grazing.</p> |
| Biodiversity study | Animal Species Assessment | <p>DEA Screening Report findings:</p> <ul style="list-style-type: none"> <i>Plant Species theme sensitivity:</i> Medium sensitivity <i>Aquatic Biodiversity sensitivity</i> Very High sensitivity <i>Terrestrial Biodiversity sensitivity:</i> Very High sensitivity. |
| | Aquatic Biodiversity Impact Assessment | |

| | | |
|---|---|--|
| | Plant Species Assessment | <ul style="list-style-type: none"> <i>Animal Species sensitivity</i>: Low sensitivity |
| | Terrestrial Biodiversity Impact Assessment | <p>This application is only for a certain portion of 5ha on a farm portion that is approximately 53ha. The disturbance is small compared to the size of the farm portion. Mitigation measures as in the EMPr will be implemented.</p> <p>Some of the mitigation measure include:</p> <ul style="list-style-type: none"> No animals may be hunted or killed during the prospecting phase. No protected trees may be removed without a permit. |
| Archaeological and Cultural Heritage Impact Assessment | <p>DEA Screening Report findings:</p> <ul style="list-style-type: none"> <i>Paleontology Theme Sensitivity</i>: Very High sensitivity <i>Archaeological and Cultural Heritage Theme Sensitivity</i>: Low Sensitivity <p>If anything of Archaeological and/or paleontological significance is found during the construction and operational phase of the mine the following applies:</p> <ul style="list-style-type: none"> NHRA 38(4)c(i) – If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (021 462 5402) must be alerted as per section 35(3) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule; NHRA 38(4)c(ii) – If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (012 320 8490), must be alerted immediately as per section 36(6) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule; NHRA 38(4)e – The following conditions apply with regards to the appointment of specialists: i) If heritage resources are uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA; | |
| Palaeontology Impact Assessment | <p>If fossil remains or trace fossils are discovered during any phase of construction, either on the surface or exposed by excavations the Chance Find Protocol must be implemented by the Environmental Control Officer (ECO) in charge of these developments. These discoveries ought to be protected and the ECO must report to SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that mitigation can be carry out by a paleontologist.</p> <p>Chance Find Procedure</p> <ul style="list-style-type: none"> If a chance find is made the person responsible for the find must immediately stop working and all work that could impact that finding must cease in the immediate vicinity of the find. The person who made the find must immediately report the find to his/her direct supervisor which in turn must report the find to his/her manager and the ESO or site manager. The ESO or site manager must report the find to the relevant Heritage Agency (South African Heritage Research Agency, SAHRA). (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: | |

| | |
|--|--|
| | <p>021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za). The information to the Heritage Agency must include photographs of the find, from various angles, as well as the GPS co-ordinates.</p> <ul style="list-style-type: none"> • A preliminary report must be submitted to the Heritage Agency within 24 hours of the find and must include the following: 1) date of the find; 2) a description of the discovery and a 3) description of the fossil and its context (depth and position of the fossil), GPS co-ordinates. • Photographs (the more the better) of the discovery must be of high quality, in focus, accompanied by a scale. It is also important to have photographs of the vertical section (side) where the fossil was found. <p>Upon receipt of the preliminary report, the Heritage Agency will inform the ESO (or site manager) whether a rescue excavation or rescue collection by a palaeontologist is necessary.</p> <ul style="list-style-type: none"> • The site must be secured to protect it from any further damage. No attempt should be made to remove material from their environment. The exposed finds must be stabilized and covered by a plastic sheet or sand bags. The Heritage agency will also be able to advise on the most suitable method of protection of the find. • In the event that the fossil cannot be stabilized the fossil may be collected with extreme care by the ESO (site manager). Fossils finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site. • Once Heritage Agency has issued the written authorization, the developer may continue with the development on the affected area. |
| Noise Impact Assessment | We do not see the need for this study as there is an existing mine and processing plant on Portion 90 of the farm Elandsfontein 34. |
| Radioactivity Impact Assessment | This study is not necessary since the process of mining Stone Aggregate does not have any radioactive effects. |

L) ENVIRONMENTAL IMPACT STATEMENT

i) SUMMARY OF THE KEY FINDINGS

This section provides a summary of the assessment and conclusions drawn from the proposed mining area. In doing so, it draws on the information gathered as part of the environmental impact assessment process and the knowledge gained by the environmental consultant during the course of the process and presents an informed opinion on the environmental impacts associated with the proposed project. The following conclusions can be drawn for the proposed mining activity:

➤ Potential impacts on biodiversity:

According to **Figure 20 and Figure 21** the proposed area is covered by natural vegetation. The natural vegetation consists mostly of Low Shrublands and a small area of Grasslands according to the land use map.

There is an existing mine on Portion 90 of the farm Elandsfontein 34, please see the Google earth maps (**figure 22, figure 23 and Appendix 5**).

This application is only for a certain portion of 5ha on a farm portion that is approximately 53ha. The disturbance is small compared to the size of the farm portion. Mitigation measures as in the EMPr will be implemented.

According to the DEA Screening report the sensitivity of the proposed area is as follow:

Plant Species theme sensitivity: Medium sensitivity

Aquatic Biodiversity sensitivity: Very High sensitivity

Terrestrial Biodiversity sensitivity: Very High sensitivity.

Animal Species sensitivity: Low sensitivity

➤ Potential impact on Archaeological artifacts and Palaeontological resources:

According to the DEA Screening report the sensitivity of the proposed area is as follow:

Paleontology Theme Sensitivity: Very High sensitivity

Archaeological and Cultural Heritage Theme Sensitivity: Low Sensitivity

If anything of Archaeological and/or paleontological significance is found during the construction and operational phase of the mine the following applies:

- NHRA 38(4)c(i) – If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (021 462 5402) must be alerted as per section 35(3) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule;
- NHRA 38(4)c(ii) – If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (012 320 8490), must be alerted immediately as per section 36(6) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule;
- NHRA 38(4)e – The following conditions apply with regards to the appointment of specialists: i) If heritage resources are uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA;

If fossil remains or trace fossils are discovered during any phase of construction, either on the surface or exposed by excavations the **Chance Find Protocol** must be implemented by the Environmental Control Officer (ECO) in charge of these developments. These discoveries ought to be protected and the ECO must report to SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that mitigation can be carry out by a paleontologist.

Chance Find Procedure

- If a chance find is made the person responsible for the find must immediately stop working and all work that could impact that finding must cease in the immediate vicinity of the find.
- The person who made the find must immediately report the find to his/her direct supervisor which in turn must report the find to his/her manager and the ESO or site manager. The ESO or site manager must report the find to the relevant Heritage Agency (South African Heritage Research Agency, SAHRA). (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za). The information to the Heritage Agency must include photographs of the find, from various angles, as well as the GPS co-ordinates.
- A preliminary report must be submitted to the Heritage Agency within 24 hours of the find and must include the following: 1) date of the find; 2) a description of the discovery and a 3) description of the fossil and its context (depth and position of the fossil), GPS co-ordinates.
- Photographs (the more the better) of the discovery must be of high quality, in focus, accompanied by a scale. It is also important to have photographs of the vertical section (side) where the fossil was found.

Upon receipt of the preliminary report, the Heritage Agency will inform the ESO (or site manager) whether a rescue excavation or rescue collection by a palaeontologist is necessary.

- The site must be secured to protect it from any further damage. No attempt should be made to remove material from their environment. The exposed finds must be stabilized and covered by a plastic sheet or sand bags. The Heritage agency will also be able to advise on the most suitable method of protection of the find.
 - In the event that the fossil cannot be stabilized the fossil may be collected with extreme care by the ESO (site manager). Fossils finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site.
 - Once Heritage Agency has issued the written authorization, the developer may continue with the development on the affected area.
- Potential impacts on land use: The proposed 5ha area is covered in natural vegetation. The proposed mining activities will significantly impact on the land use and change the sense of place of the area. However, the proposed 5ha area is not used for any agricultural related activities.
- Potential social impacts: The presence of construction workers poses a potential risk to family structures and social networks. While the presence of construction workers does not in itself constitute a social impact, the manner in which construction workers conduct themselves can impact on local communities. The most significant negative impact is associated with the disruption of existing family structures and social networks.

However, there is there an existing mine and processing plant on a certain portion of Portion 90 of the farm Elandsfontein 34

- Potential negative impacts: (noise, dust, soil degradation, storm water, traffic, health and safety) associated with the operation of the facility are expected to be of low - high impact, of medium terms and site specific. These can be mitigated or negated through the implementation of practical and appropriate mitigation measures.
- Positive impacts: The mining of Stone aggregate may result in socio-economic benefit to the area.

All possible negative impacts and risks that have been identified in this report can be effectively mitigated and managed by implementing the migratory measures as set out in the Environmental Management Programme (EMPr) attached in Part B.

ii) FINAL SITE MAP

Provide a map at an appropriate scale which superimposes the proposed overall activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers.

Refer to Site layout Map attached in **Appendix 4**.

iii) SUMMARY OF THE POSITIVE AND NEGATIVE IMPLICATIONS AND RISKS OF THE PROPOSED ACTIVITY AND IDENTIFIED ALTERNATIVES

- Increased noise levels
- Potential water and soil pollution impacts.
- Potential loss of fauna and flora.
- Increased vehicle activity.
- Increased dust levels.
- Increase in water consumption and possible depletion of groundwater resources.
- Potential visual impacts.

All possible negative impacts and risks that have been identified in this report can be effectively mitigated and managed by implementing the mitigation measures as set out in the Environmental Management Programme (EMPr) attached in Part B.

M) PROPOSED IMPACT MANAGEMENT OBJECTIVES AND THE IMPACT MANAGEMENT OUTCOMES FOR INCLUSION IN THE EMPr (Based on the assessment and where applicable the recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation)

Management objectives include:

- Ensure that the mining activity does not cause pollution to the environment or harm to persons.
- Minimise production of waste.
- All mining activities must be conducted in a manner that minimises noise impact, litter, environmental degradation and health hazards i.e. injuries.
- The mine must be kept neat and tidy during waste handling to prevent unsightliness and accidents.

Expected outcomes include:

- Minimum impacts on the environment as a result of mining.
- Compliance with legislative requirements.
- Mine is neat and tidy and well managed.

FINAL PROPOSED ALTERNATIVES

(Provide an explanation for the final layout of the infrastructure and activities on the overall site as shown on the final site map together with the reasons why they are the final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment)

This alternative asks the question, if there is not, from an environmental perspective, a more suitable location for the proposed activity. Due to the expected mineral resources, **GCG Crushers CC** would like to potentially mine for Stone aggregate on a certain 5ha portion of Portion 90 of the farm Elandsfontein 34, Registration Division: IP, North West province, therefore there will be no other alternative (i.e. to facilitate the movement of machinery, equipment, infrastructure).

N) ASPECTS FOR INCLUSION AS CONDITIONS OF AUTHORISATION.

Any aspects which have not formed part of the EMPr that must be made conditions of the Environmental Authorisation

- The operational activities and relevant rehabilitation of disturbed areas should be monitored against the improved EMPr and all other relevant environmental legislation.
- A copy of the EMP should be made available onsite at all times.
- Implementation of the proposed mitigation measures set out in the EMPr.

O) DESCRIPTION OF ANY ASSUMPTIONS, UNCERTAINTIES AND GAPS IN KNOWLEDGE. (Which relate to the assessment and mitigation measures proposed)

The uncertainties in results are mostly related to the availability of information, time available to gather the relevant information as well as the sometimes-subjective nature of the assessment methodology. In terms of addressing the key issues the EAP is satisfied that there is sufficient information to conduct the significance rating and provide the environmental authority with sufficient information to make an informed decision. If the competent authority feels that specialists' studies need to be conducted, such will be corresponded to the applicant.

P) REASONED OPINION AS TO WHETHER THE PROPOSED ACTIVITY SHOULD OR SHOULD NOT BE AUTHORISED

Reasons why the activity should be authorized or not.

Based on the outcomes of the current Mining activities in the area the possibility to encounter further diamond bearing gravel, were identified.

The option of not approving the activities will result in a significant loss of possible valuable minerals being exploited and all economic benefits will be lost.

Q) CONDITIONS THAT MUST BE INCLUDED IN THE AUTHORISATION

- The operational activities and relevant rehabilitation of disturbed areas should be monitored against the improved EMPr and all other relevant environmental legislation.
- A copy of the EMP should be made available onsite at all times.
- Implementation of the proposed mitigation measures set out in the EMPr.

The EMPr should be binding on all managers and contractors operating/utilizing the site.

Period for which the Environmental Authorisation is required.

For a minimum of 3 years.

R) UNDERTAKING

Confirm that the undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Basic assessment report and the Environmental Management Programme report.

The undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Environmental Impact Assessment report and the Environmental Management Programme report.

I, **Ms. Lizanne Esterhuizen** (EAP) herewith confirms

- A. the correctness of the information provided in the reports ☒
- B. the inclusion of comments and inputs from stakeholders and I&APs ; ☒
- C. the inclusion of inputs and recommendations from the specialist reports where relevant; ☒ and
- D. the acceptability of the project in relation to the finding of the assessment and level of mitigation proposed; ☒



Signature of the environmental assessment practitioner:

Milnex CC

Name of company:

04/07/2022

Date:

S) FINANCIAL PROVISION

State the amount that is required to both manage and rehabilitate the environment in respect of rehabilitation.

XXXXXX

Mining will be restricted to the 5ha area.

It is planned that 48 trenches will be dug (it may be less depending on the results) at an extent of 50m (length) x 20m (breath) x 0.5m – 5m (depth).

- $(48 \text{ trenches} / 24 \text{ months}) \times 12 \text{ months} = 24 \text{ trenches dug per year}$
- $\text{Total area to be disturbed per year} = 24 \text{ trenches} \times (50\text{m} \times 20\text{m}) / 10\,000 = 2.4 \text{ Ha disturbed for 12 months}$
- $\text{Total area disturbed for 24 months} = 48 \text{ trenches} \times (50\text{m} \times 20\text{m}) / 10\,000 = 4.8 \text{ Ha disturbed}$

Since concurrent rehabilitation will take place, the total area to be disturbed per year will be less than the above calculation. Following the aforementioned sequence will ensure that the maximum area to be disturbed by mining activities at any given time, is only **0.25ha**

| TRENCHES (24 months) | |
|---|---|
| Area to be disturbed for 12 months for trenches | 2.4 Ha disturbed |
| Area to be disturbed for 24 months for trenches | 4.8 Ha disturbed |
| However concurrent rehabilitation will take place thus: | |
| The area to be disturbed for 1 trench | $1 \text{ trench} \times (50\text{m} \times 20\text{m}) / 10\,000 = 0.1\text{ha}$ |
| 3 trenches will be worked on at any given time: <ul style="list-style-type: none"> • 2 trenches will be open to remove gravel • 1 trench will be backfilled and rehabilitated | $0.1\text{ha} \times 2 \text{ trenches} = 0.2\text{ha}$ $0.1\text{ha} / 2 = 0.05\text{ha}$ |
| The area to be disturbed at any given time | $0.2\text{ha} + 0.05\text{ha} = \mathbf{0.25ha}$ |
| After the trench is backfilled and rehabilitated only then will another trench be opened. This sequence will be done for the 50 trenches. | |
| Total | 0.25ha |

i) Explain how the aforesaid amount was derived.

The closure cost estimate provided above aligned with the Financial Provisioning Regulations, 2015. The amount was calculated by Milnex CC.

Financial Guarantee

The financial guarantee for the rehabilitation for land disturbed by **GCG Crushers CC**, will be submitted to the department on request

Rehabilitation Fund

GCG Crushers CC will also make provision for rehabilitation during closure by establishing a rehabilitation trust.

ii) Motivation for the deviation.

Not applicable

T) OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

COMPLIANCE WITH THE PROVISIONS OF SECTIONS 24(4)(A) AND (B) READ WITH SECTION 24 (3) (A) AND (7) OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT 107 OF 1998). THE EIA REPORT MUST INCLUDE THE:

- i. **Impact on the socio-economic conditions of any directly affected person.** (Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as Appendix 2.19.1 and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6. and 2.12. herein).

The following impacts may be regarded as community impacts:

- Increased noise levels
- Potential water and soil pollution impacts.
- Potential loss of fauna and flora.
- Increased vehicle activity.
- Increased dust levels.
- Increase in water consumption and possible depletion of groundwater resources.
- Potential visual impacts.

Indirect socio-economic benefits are expected to be associated with the creation of employment.

- ii. **Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act.** (Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or prospecting on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) with the exception of the national estate contemplated in section 3(2)(i)(vi) and (vii) of that Act, attach the investigation report as Appendix 2.19.2 and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6. and 2.12. herein).

According to the DEA Screening report the sensitivity of the proposed area is as follow:

Paleontology Theme Sensitivity: Very High sensitivity

Archaeological and Cultural Heritage Theme Sensitivity: Low Sensitivity

If anything of Archaeological and/or paleontological significance is found during the construction and operational phase of the mine the following applies:

- NHRA 38(4)c(i) – If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (021 462 5402) must be alerted as per section 35(3) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule;
- NHRA 38(4)c(ii) – If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (012 320 8490), must be alerted immediately as per section 36(6) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule;
- NHRA 38(4)e – The following conditions apply with regards to the appointment of specialists: i) If heritage resources are uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA;

If fossil remains or trace fossils are discovered during any phase of construction, either on the surface or exposed by excavations the **Chance Find Protocol** must be implemented by the Environmental Control Officer (ECO) in charge of these

developments. These discoveries ought to be protected and the ECO must report to SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that mitigation can be carry out by a paleontologist.

Chance Find Procedure

- If a chance find is made the person responsible for the find must immediately stop working and all work that could impact that finding must cease in the immediate vicinity of the find.
- The person who made the find must immediately report the find to his/her direct supervisor which in turn must report the find to his/her manager and the ESO or site manager. The ESO or site manager must report the find to the relevant Heritage Agency (South African Heritage Research Agency, SAHRA). (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za). The information to the Heritage Agency must include photographs of the find, from various angles, as well as the GPS co-ordinates.
- A preliminary report must be submitted to the Heritage Agency within 24 hours of the find and must include the following: 1) date of the find; 2) a description of the discovery and a 3) description of the fossil and its context (depth and position of the fossil), GPS co-ordinates.
- Photographs (the more the better) of the discovery must be of high quality, in focus, accompanied by a scale. It is also important to have photographs of the vertical section (side) where the fossil was found.

Upon receipt of the preliminary report, the Heritage Agency will inform the ESO (or site manager) whether a rescue excavation or rescue collection by a palaeontologist is necessary.

- The site must be secured to protect it from any further damage. No attempt should be made to remove material from their environment. The exposed finds must be stabilized and covered by a plastic sheet or sand bags. The Heritage agency will also be able to advise on the most suitable method of protection of the find.
- In the event that the fossil cannot be stabilized the fossil may be collected with extreme care by the ESO (site manager). Fossils finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site.
- Once Heritage Agency has issued the written authorization, the developer may continue with the development on the affected area.

U) OTHER MATTERS REQUIRED IN TERMS OF SECTIONS 24(4)(A) AND (B) OF THE ACT.

(the EAP managing the application must provide the competent authority with detailed, written proof of an investigation as required by section 24(4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives, as contemplated in sub-regulation 22(2)(h), exist. The EAP must attach such motivation as Appendix 4).

From a local perspective, the mining of Stone aggregate (Gravel) and Stone Aggregate (From waste dump) including associated infrastructure, structure, and earthworks on a certain 5ha portion of Portion 90 of the farm Elandsfontein 34, Registration Division: IP, North West province, is preferred because the geological formation supports the possibility that the minerals applied for could be found on the proposed area.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1) Draft environmental management programme.

A) DETAILS OF THE EAP

- i) The EAP who prepared the report
- ii) Expertise of the EAP

| Name of Practitioner | Qualifications | Contact details |
|----------------------|---|---|
| Lizanne Esterhuizen | Honours Degree in Environmental Science (refer to Appendix 1) | Tel No.: (018) 011 1925 Fax No. : (053) 963 2009 e-mail address: lizanne@milnex-sa.co.za |
| Christiaan Baron | Master's Degree in Environmental Management (M.ENV.MAN) (refer to Appendix 1) | Tel No.: (018) 011 1925 Fax No.: (053) 963 2009 e-mail address: christiaan@milnex-sa.co.za |
| Andile Grant Nxumalo | Honours Degree in Environmental Science (refer to Appendix 1) | Tel No.: (018) 011 1925 Fax No. : (053) 963 2009 e-mail address: andile.grant@milnex-sa.co.za |

B) DESCRIPTION OF THE ASPECTS OF THE ACTIVITY (Confirm that the requirement to describe the aspects of the activity that are covered by the draft environmental management programme is already included in PART A, section (1)(h) herein as required).

It is hereby confirmed that the requirements to describe the aspects of the activity that are required by the EMP is already included in Part A, section 1(h).

C) COMPOSITE MAP

(Provide a map (Attached as an Appendix) at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers)

Refer to Locality Map, attached as **Appendix 4**.

D) DESCRIPTION OF IMPACT MANAGEMENT OBJECTIVES INCLUDING MANAGEMENT STATEMENTS

- i. **Determination of closure objectives.** (ensure that the closure objectives are informed by the type of environment described in 2.4 herein)

Closure objectives for the Mining Permit will aim to ensure that the residual post-closure impacts be minimized and be acceptable to relevant parties. To achieve these closure objectives, the following will be implemented:

STOCKPILE AREAS AND THE WASTE ROCK DUMP

The following activities will take place at closure:

- Any residue stockpiles need to be removed and placed in the base of the final void (excluding the final waste rock dump that will remain);
- It is recommended that the Waste Rock dump be shaped to an 18°-slope; and
- Topsoil will be spread over all disturbed areas and re-vegetated.

OPEN PIT

Rehabilitation activities will be:

- The pit edges will be sloped with any waste rock and unused overburden to a safe gradient.

- Slopes that have overburden coverage will be revegetated.
- Any remaining unusable waste rocks and overburden (if any) will be placed into the pit to partly fill voids.

INFRASTRUCTURE AREAS

The following activities will take place at closure:

- All surface plant, buildings and equipment will be removed from site if necessary.
- Foundations will be removed to a meter (1m) below surface and placed in the final void or disposed of at a registered landfill site if required;
- The surface areas will be levelled and vegetated

There will be removed from site where there is not reasonable prospect they will be needed for any activities

ACCESS ROADS

These will be removed from site where there is not reasonable prospect they will be needed for any activities.

- Final landforms must be resilient to perturbation and also be self-sustaining to obviate/limit further/ongoing interventions and maintenance by **GCG Crushers CC**. The remaining impacts be of an acceptable nature with minimal deterioration over time.
- Environmental and human quality of life, including health and safety requirements in general, would not be compromised; and
- Closure is achieved in an efficient and cost-effective manner as possible and with minimum socioeconomic changes.

The above goal is underpinned by more specific objectives listed below.

1. Upfront planning/development

To provide overall guidance and direction to closure planning and/or the implementation of progressive closure measures over the remaining over the mining life.

2. Physical stability

To ensure that surface infrastructure and mining residue and/or disturbances that are present at processing plant decommissioning will be removed and/or stabilised in a manner that these will not compromise post-closure land use and be sustainable long-term landforms.

- Closure, removal and disposal of all surface infrastructure that has no beneficial post-closure use.
- Shaping and vegetating the remaining earth embankments, trenches, etc. to stabilise slopes and integrate with surrounding topography.

3. Environmental quality

To ensure that local environmental quality is not adversely affected by possible physical effects arising from mining operations and the mining site after closure. This will be achieved by:

- Avoiding and/or limiting the following during mining operations which could result in adverse effects that could not be readily addressed and/or mitigated at mine closure.
 - Dust fall-out areas surrounding the mining site.
 - Wash-off and/or mobilisation of chemically contaminated soils and sediments from the mining site that could have long term adverse effects on local aquatic health and/or other water uses.
 - Possible shallow groundwater contamination adversely affecting the quality of the local water resource and its beneficial use.
- Limiting the potential for dust generation on the rehabilitated mining site that could cause nuisance and/or health effects to surrounding landowners;
- Limiting the possible adverse water quality and quantity effects arising from the rehabilitated mining site to ensure that long term beneficial use of local resources is not compromised;
- Conducting soil clean-up/remediation to ensure that the planned land use could be implemented and maintained;

4. Health and safety

To limit the possible health and safety treats due to terrain hazards to humans and animals utilizing the rehabilitated mining site after closure by:

- Demonstrating through upfront soil testing that any resultant inorganic and organic pollution present on the site is acceptable;
- Removal of potential contaminants such as hydrocarbons and chemicals off site;
- Shaping of embankments and trenches to safe slopes and reintegrating of these into surrounding topography.
- Ensuring that the environmental quality as reflected above is achieved.

5. Land capability / land use

To ensure that the required land capability to achieve and support the planned land use can be achieved over the mining site by:

- Clean-up and reclamation of contaminated soil areas in order not to compromise the above land use planning earmarked for implementation;
- To ensure that the overall rehabilitated mining site is free draining
- Transferring mining related surface infrastructure to third parties for beneficial use after closure.

6. Aesthetic quality

To ensure that the rehabilitated mining site will display, at a minimum, an acceptable aesthetic appearance that would not compromise the planned land use by leaving behind:

- A mining area that is properly cleared-up with no fugitive/scattered waste piles
- Rehabilitated mining area that is free draining and disturbed areas that are suitably vegetated.
- Rehabilitated mining residues that are suitably landscaped, blending with the surrounding environment as far as possible.
- Shaped and rehabilitated terrace and hard stand areas, roughly emulating the local natural surface topography.

7. Landscape viability

Since it will be a quarry, the area will be sloped as far as possible and managed

8. Biodiversity

To encourage, where appropriate, the re-establishment of native vegetation on the rehabilitated mine site such the terrestrial biodiversity is largely re-instated over time, by:

- Stabilising disturbed areas to prevent erosion in the short- to medium term until a suitable vegetation cover has established; and
- Since it will be a quarry, the area will be sloped as far as possible and managed

Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main mining activities, including the anticipated mining area at the time of closure.

The Rehabilitation & Closure Plan is attached as **Appendix 9**.

Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline.

XXXXXX

Mining will be restricted to the 5ha area.

It is planned that 50 trenches will be dug (it may be less depending on the results) at an extent of 50m (length) x 20m (breath) x 0.5m – 12-15m (depth).

- $(50 \text{ trenches} / 24 \text{ months}) \times 12 \text{ months} = 25 \text{ trenches dug per year}$
- $\text{Total area to be disturbed per year} = 10 \text{ trenches} \times (50\text{m} \times 20\text{m}) / 10\,000 = 2.5 \text{ Ha disturbed for 12 months}$
- $\text{Total area disturbed for 24 months} = 50 \text{ trenches} \times (50\text{m} \times 20\text{m}) / 10\,000 = 5 \text{ Ha disturbed}$

Sloping of the area will form part of rehabilitation.

Since concurrent rehabilitation will take place, the total area to be disturbed per year will be less than the above calculation. Following the aforementioned sequence will ensure that the maximum area to be disturbed by mining activities at any given time, is only **0.25ha**

| TRENCHES (24 months) | |
|---|---|
| Area to be disturbed for 12 months for trenches | 2.5 Ha disturbed |
| Area to be disturbed for 24 months for trenches | 5 Ha disturbed |
| However concurrent rehabilitation will take place thus: | |
| The area to be disturbed for 1 trench | $1 \text{ trench} \times (50\text{m} \times 20\text{m}) / 10\,000 = 0.1\text{ha}$ |
| 3 trenches will be worked on at any given time: <ul style="list-style-type: none"> • 2 trenches will be open to remove gravel • 1 trench will be backfilled and rehabilitated | $0.1\text{ha} \times 2 \text{ trenches} = 0.2\text{ha}$ $0.1\text{ha} / 2 = 0.05\text{ha}$ |
| The area to be disturbed at any given time | $0.2\text{ha} + 0.05\text{ha} = 0.25\text{ha}$ |
| After the trench is backfilled and rehabilitated only then will another trench be opened. This sequence will be done for the 50 trenches. | |
| Total | 0.25ha |

(a) **Confirm that the financial provision will be provided as determined.**

Financial Guarantee

The financial guarantee for the rehabilitation for land disturbed **GCG Crushers CC** will be submitted

Rehabilitation Fund

GCG Crushers CC will also make provision for rehabilitation during closure by establishing a rehabilitation trust.

E) IMPACTS TO BE MITIGATED IN THEIR RESPECTIVE PHASES

Measures to rehabilitate the environment affected by the undertaking of any listed activity

| ACTIVITIES (E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc E.g. For mining,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.) | PHASE (of operation in which activity will take place. State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure). | SIZE AND SCALE of disturbance (volumes, tonnages and hectares or m ²) | MITIGATION MEASURES (describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants) | COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) | TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-.. Upon cessation of the individual activity Or. Upon the cessation of mining, bulk sampling or prospecting as the case may be. |
|--|---|--|--|---|---|
| Clearance of vegetation | Open-pit mining (construction and operation phase) | 5ha | <ol style="list-style-type: none"> 1. Site clearing must take place in a phased manner, as and when required. 2. Areas which are not to be mined within two months must not be cleared to reduce erosion risks. 3. The area to be cleared must be clearly demarcated and this footprint strictly maintained. 4. Spoil that is removed from the site must be removed to an approved spoil site or a licensed landfill site. 5. The necessary silt fences and erosion control measures must be implemented in areas where these risks are more prevalent. | Compliance with Duty of Care as detailed within NEMA | Duration of operations on the mining activities. |
| Construction of roads | Open-pit mining (construction and operation phase) | | <ol style="list-style-type: none"> 1. Planning of access routes to the site for construction/mining purposes shall be done in conjunction with the Contractor and the Landowner. All agreements reached should be documented and no verbal agreements should | Compliance with Duty of Care as detailed within NEMA | Duration of operations on the mining activities. |

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| | | | <p>be made. The Contractor shall clearly mark all access roads. Roads not to be used shall be marked with a "NO ENTRY for mining vehicles" sign.</p> <ol style="list-style-type: none"> 2. Construction routes and required access roads must be clearly defined. 3. Damping down of the un-surfaced roads must be implemented to reduce dust and nuisance. 4. Soils compacted by construction/mining activities shall be deep ripped to loosen compacted layers and re-graded to even running levels. 5. The contractor must ensure that damage caused by related traffic from a gravel road is repaired continuously. The costs associated with the repair must be borne by the contractor; 6. Dust suppression measures must be implemented for heavy vehicles such as wetting of gravel roads on a regular basis and ensuring that vehicles used to transport the gravel are fitted with tarpaulins or covers; 7. All vehicles must be road-worthy and drivers must be qualified and made aware of the potential road safety issues and need for strict speed limits. | | |
| Mining Stone aggregate (Gravel) and Stone Aggregate (From waste dump) – Soils and geology | Open-pit mining (construction and operation phase) | 5ha | <ol style="list-style-type: none"> 1. The Contractor should, prior to the commencement of earthworks determine the average depth of topsoil (If topsoil exists), and agree on this with the ECO. The full depth of topsoil should be stripped from areas affected by construction and related activities prior to the commencement of major earthworks. This should include the building footprints, working areas and storage areas. Topsoil must be reused where possible to rehabilitate disturbed areas. | Compliance with Duty of Care as detailed within NEMA | Duration of operations on the mine |

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| | | | <ol style="list-style-type: none"> 2. Care must be taken not to mix topsoil and subsoil or any other material, during stripping. 3. The topsoil must be conserved on site in and around the pit/trench area. 4. Subsoil and overburden in the mining area should be stockpiled separately to be returned for backfilling in the correct soil horizon order. 5. If stockpiles are exposed to windy conditions or heavy rain, they should be covered either by vegetation or geofabric, depending on the duration of the project. Stockpiles may further be protected by the construction of berms, trenches or low brick walls around their bases. 6. Stockpiles should be kept clear of weeds and alien vegetation growth by regular weeding. 7. Where contamination of soil is expected, analysis must be done prior to disposal of soil to determine the appropriate disposal route. Proof from an approved waste disposal site where contaminated soils are dumped if and when a spillage/leakage occurs should be attained and given to the project manager. 8. The impact on the geology will be permanent. There is no mitigation measure. | | |
| Mining Stone aggregate (Gravel) and Stone Aggregate (From waste dump) – excavations | Open-pit mining (construction and operation phase) | 5ha | <ol style="list-style-type: none"> 1. The mining activities must aim to adhere to the relevant noise regulations and limit noise to within standard working hours in order to reduce disturbance of dwellings in close proximity to the development. 2. Mine, pans, workshops and other noisy fixed facilities should be located well away from noise sensitive areas. Once the proposed final layouts are made available by the Contractor(s), the sites must be evaluated in detail and specific measures designed in to the system. | Compliance with Duty of Care as detailed within NEMA | Duration of operations on the mining area |

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| | | | <ol style="list-style-type: none"> 3. Truck traffic should be routed away from noise sensitive areas, where possible. 4. Noise levels must be kept within acceptable limits. 5. Noisy operations should be combined so that they occur where possible at the same time. 6. Mine workers to wear necessary ear protection gear. 7. Noisy activities to take place during allocated hours. 8. Noise from labourers must be controlled. 9. Noise suppression measures must be applied to all equipment. Equipment must be kept in good working order and where appropriate fitted with silencers which are kept in good working order. Should the vehicles or equipment not be in good working order, the Contractor may be instructed to remove the offending vehicle or machinery from the site. 10. The Contractor must take measures to discourage labourers from loitering in the area and causing noise disturbance. Where possible labour shall be transported to and from the site by the Contractor or his Sub-Contractors by the Contractors own transport. 11. Implementation of enclosure and cladding of processing plants. 12. Applying regular and thorough maintenance schedules to equipment and processes. An increase in noise emission levels very often is a sign of the imminent mechanical failure of a machine. | | |
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IMPACT MANAGEMENT OUTCOMES

(A description of impact management outcomes, identifying the standard of impact management required for the aspects contemplated in paragraph ());

| ACTIVITY (whether listed or not listed). (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.). | POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...) | ASPECTS AFFECTED | PHASE In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post-closure) | MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) E.g. <ul style="list-style-type: none"> • Modify through alternative method. • Control through noise control • Control through management and monitoring • Remedy through rehabilitation.. | STANDARD TO BE ACHIEVED (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc. |
|--|--|-------------------------|--|--|--|
| Clearance of vegetation | Loss or fragmentation of habitats | Fauna & flora | (construction and operation phase) | Existing vegetation <ol style="list-style-type: none"> 1. Vegetation removal must be limited to the mining area. 2. Vegetation to be removed as it becomes necessary rather than removal of all vegetation throughout the site in one step. 3. No vegetation to be used for firewood. 4. Exotic and invasive plant species should not be allowed to establish, if the development is approved. 5. There should be a preconstruction walk-through of the development footprint/project site in order to locate individuals of plant species of conservation concern. A search and rescue exercise must be done to locate and relocate any protected species to a suitable and similar habitat where these plants can grow without any disturbance; 6. In case Camel Thorn or Shepherd's trees are found permits must be obtained from DAFF to remove these individuals. The contractor must apply for these permits in a phased manner as mining proceeds. | Minimisation of impacts to acceptable limits |

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| | | | | <p>Rehabilitation</p> <p>7. Since it will be a quarry, the area will be sloped as far as possible and managed</p> <p>Demarcation of mining area</p> <p>8. All plants not interfering with mining operations shall be left undisturbed clearly marked and indicated on the site plan.</p> <p>9. The mining area must be well demarcated and no construction/mining activities must be allowed outside of this demarcated footprint.</p> <p>10. Vegetation removal must be phased in order to reduce impact of construction/mining.</p> <p>11. Site office and laydown areas must be clearly demarcated and no encroachment must occur beyond demarcated areas.</p> <p>12. Strict and regular auditing of the mining process to ensure containment of the mining and laydown areas.</p> <p>13. Soils must be kept free of petrochemical solutions that may be kept on site during construction/mining. Spillage can result in a loss of soil functionality thus limiting the re-establishment of flora.</p> <p>Utilisation of resources</p> <p>14. Gathering of firewood, fruit, muti plants, or any other natural material onsite or in areas adjacent to the site is prohibited unless with prior approval of the ECO.</p> <p>Exotic vegetation</p> <p>15. Alien vegetation on the site will need to be controlled.</p> <p>16. The Contractor should be responsible for implementing a programme of weed control (particularly in areas where soil has been disturbed); and grassing of any remaining stockpiles to prevent weed invasion.</p> | |
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| | | | | <p>17. The spread of exotic species occurring throughout the site should be controlled.</p> <p>18. Weed control measures must be applied to eradicate any noxious weeds (category 1a & 1b species) on disturbed areas.</p> <p>Herbicides</p> <p>19. Herbicide use shall only be allowed according to contract specifications. The application shall be according to set specifications and under supervision of a qualified technician. The possibility of leaching into the surrounding environment shall be properly investigated and only environmentally friendly herbicides shall be used.</p> <p>20. The use of pesticides and herbicides on the site must be discouraged as these impact on important pollinator species of indigenous vegetation.</p> <p>Fauna</p> <p>21. Rehabilitation to be undertaken as soon as possible after the mining activities have been completed.</p> <p>22. No trapping or snaring to fauna on the construction/mining site should be allowed.</p> <p>23. No faunal species must be disturbed, trapped, hunted or killed by maintenance staff during any routine maintenance at the development.</p> <p>24. Any fauna threatened by the construction and operation activities should be removed to safety by the ECO or appropriately qualified environmental officer.</p> <p>25. All construction vehicles should adhere to a low speed limit (<30km/h) to avoid collisions with susceptible species such as snakes and tortoises.</p> <p>26. If trenches need to be dug for electrical cabling or other purposes, these should not be left open for extended periods of time as fauna may fall in and become trapped</p> | |
|--|--|--|--|---|--|

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|---|-----------------|------|------------------------------------|--|--|
| | | | | in them. Trenches which are exposed should contain soil ramps allowing fauna to escape the trench. | |
| Mining Stone aggregate (Gravel) and Stone Aggregate (From waste dump) – excavations | Loss of topsoil | Soil | (construction and operation phase) | <ol style="list-style-type: none"> 1. The Contractor should, prior to the commencement of earthworks determine the average depth of topsoil, and agree on this with the ECO. The full depth of topsoil should be stripped from areas affected by construction and related activities prior to the commencement of major earthworks. This should include the building footprints, working areas and storage areas. Topsoil must be reused where possible to rehabilitate disturbed areas. 2. Care must be taken not to mix topsoil and subsoil or any other material, during stripping. 3. The topsoil must be conserved on site in and around the pit/trench area. 4. Subsoil and overburden in the mining area should be stockpiled separately to be returned for backfilling in the correct soil horizon order. 5. If stockpiles are exposed to windy conditions or heavy rain, they should be covered either by vegetation or geofabric, depending on the duration of the project. Stockpiles may further be protected by the construction of berms or low brick walls around their bases. 6. Stockpiles should be kept clear of weeds and alien vegetation growth by regular weeding. 7. Where contamination of soil is expected, analysis must be done prior to disposal of soil to determine the appropriate disposal route. Proof from an approved waste disposal site where contaminated soils are dumped if and when a spillage/leakage occurs should be attained and given to the project manager. <p>Establish an effective record keeping system for each area where soil is disturbed for mining purposes. These records should be included in environmental</p> | Minimisation of impacts to acceptable limits |

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|--|---------|----------------------|------------------------------------|---|--|
| | | | | <p>performance reports, and should include all the records below.</p> <ul style="list-style-type: none"> • Record the GPS coordinates of each area. • Record the date of topsoil stripping. • Record the GPS coordinates of where the topsoil is stockpiled. • Record the date of cessation mining activities at the particular site. • Photograph the area on cessation of mining activities. • Record date and depth of re-spreading of topsoil. • Photograph the area on completion of rehabilitation and on an annual basis thereafter to show vegetation establishment and evaluate progress of restoration over time. | |
| | Erosion | Soil Air Water | (construction and operation phase) | <ol style="list-style-type: none"> 1. An effective system of run-off control should be implemented, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion. 2. Periodical site inspection should be included in environmental performance reporting that inspects the effectiveness of the run-off control system and specifically records the occurrence of any erosion on site or downstream. 3. Implement an effective system of run-off control, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion. 4. Monitor the area regularly after larger rainfall events to determine where erosion may be initiated and then mitigate by modifying the soil micro-topography and revegetation or soil erosion control efforts accordingly 5. Wind screening and stormwater control should be undertaken to prevent soil loss from the site. 6. The use of silt fences and sand bags must be implemented in areas that are susceptible to erosion. | Minimisation of impacts to acceptable limits |

| | | | | | |
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| | | | | <p>7. Other erosion control measures that can be implemented are as follows:</p> <ul style="list-style-type: none"> ○ Brush packing with cleared vegetation ○ Mulch or chip packing ○ Planting of vegetation ○ Hydroseeding/hand sowing <p>8. Sensitive areas need to be identified prior to construction/ mining so that the necessary precautions can be implemented.</p> <p>9. All erosion control mechanisms need to be regularly maintained.</p> <p>10. Seeding of topsoil and subsoil stockpiles to prevent wind and water erosion of soil surfaces.</p> <p>11. Retention of vegetation where possible to avoid soil erosion.</p> <p>12. Vegetation clearance should be phased to ensure that the minimum area of soil is exposed to potential erosion at any one time.</p> <p>13. Re-vegetation of disturbed surfaces should occur immediately after construction/mining activities are completed. This should be done through seeding with indigenous grasses.</p> <p>14. No impediment to the natural water flow other than approved erosion control works is permitted.</p> <p>15. To prevent stormwater damage, the increase in stormwater run-off resulting from construction/mining activities must be estimated and the drainage system assessed accordingly.</p> <p>16. Stockpiles not used in three (3) months after stripping must be seeded or backfilled to prevent dust and erosion.</p> | |
| | Air Pollution | Air | (construction and operation phase) | <p>Dust control</p> <ol style="list-style-type: none"> 1. Wheel washing and damping down of un-surfaced and un-vegetated areas. 2. Retention of vegetation where possible will reduce dust travel. | Minimisation of impacts to acceptable limits |

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| | | | | <p>3. Clearing activities must only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas.</p> <p>4. Damping down of all exposed soil surfaces with a water bowser or sprinklers when necessary to reduce dust.</p> <p>5. The Contractor shall be responsible for dust control on site to ensure no nuisance is caused to the neighbouring communities.</p> <p>6. A speed limit of 30km/h must not be exceeded on site.</p> <p>7. Any complaints or claims emanating from the lack of dust control shall be attended to immediately by the Contractor.</p> <p>8. Any dirt roads that are utilised by the workers must be regularly maintained to ensure that dust levels are controlled.</p> <p>Odour control</p> <p>9. Regular servicing of vehicles in order to limit gaseous emissions.</p> <p>10. Regular servicing of onsite toilets to avoid potential odours.</p> <p>Rehabilitation</p> <p>11. Since it will be a quarry, the area will be sloped as far as possible and managed</p> <p>Fire prevention</p> <p>12. No open fires shall be allowed on site under any circumstance. All cooking shall be done in demarcated areas that are safe and cannot cause runaway fires.</p> <p>13. The Contractor shall have operational fire-fighting equipment available on site at all times. The level of firefighting equipment must be assessed and evaluated through a typical risk assessment process.</p> | |
| | Noise and Vibration | | (construction and operation phase) | <p>1. The mining activities must aim to adhere to the relevant noise regulations and limit noise to within</p> | Minimisation of impacts to acceptable limits |

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| | | | | <p>standard working hours in order to reduce disturbance of dwellings in close proximity to the development.</p> <ol style="list-style-type: none"> 2. Mine, crushers, workshops and other noisy fixed facilities should be located well away from noise sensitive areas. Once the proposed final layouts are made available by the Contractor(s), the sites must be evaluated in detail and specific measures designed in to the system. 3. Truck traffic should be routed away from noise sensitive areas, where possible. 4. Noise levels must be kept within acceptable limits. 5. Noisy operations should be combined so that they occur where possible at the same time. 6. Mine workers to wear necessary ear protection gear. 7. Noisy activities to take place during allocated hours. 8. Noise from labourers must be controlled. 9. Noise suppression measures must be applied to all equipment. Equipment must be kept in good working order and where appropriate fitted with silencers which are kept in good working order. Should the vehicles or equipment not be in good working order, the Contractor may be instructed to remove the offending vehicle or machinery from the site. 10. The Contractor must take measures to discourage labourers from loitering in the area and causing noise disturbance. Where possible labour shall be transported to and from the site by the Contractor or his Sub-Contractors by the Contractors own transport. 11. Implementation of enclosure and cladding of processing plants. | |
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| | | | | <p>12. Applying regular and thorough maintenance schedules to equipment and processes. An increase in noise emission levels very often is a sign of the imminent mechanical failure of a machine.</p> <p>13. The possible noise and increased ground vibration during blasting and mine activities can however be controlled by means of approved acoustic screening measures, state of the art equipment, proper noise management principles, compliance to the Local Noise Regulations, and the International Finance Corporation's Environmental Health and Safety Guidelines.</p> <p>The following three primary variables should be considered when designing acoustic screening measures for the control of sound and/or noise:</p> <ul style="list-style-type: none"> • The source – Reduction of noise at the source; • The transmission path – Reduction of noise between the source and the receiver; • The receiver – Reduction of the noise at the receiver. <p><u>Construction phase</u></p> <ul style="list-style-type: none"> • Machinery with low noise levels that complies with the manufacturer's specifications to be used • Activities to take place during daytime period only. • Noise monitoring on a quarterly basis. • Crack survey at the abutting residential areas to be carried out when complaints are received <p><u>Operational phase</u></p> <ul style="list-style-type: none"> • Emergency generators to be placed in such a manner that it is 500m away from any residential area. • Drilling with drilling rig to be done in such a manner and must be 500m away from any residential area. | |
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| | | | | <ul style="list-style-type: none"> Noise monitoring to be done on a quarterly basis when complaints are received by surrounding residents. Crushing activities to be monitored and noise survey to be done on a monthly basis after which the frequency can change to a quarterly basis. Blasting to take place under controlled conditions and by using the safe blasting methods at all times. A distance of 500m must be at all times maintained between the residential area, and the blast site and an earth berm of 10.0m to be erected in the vicinity of residential properties if surrounding residents complain about the activities. A safe distance to be maintained at the OHP during blasting activities. Blasting activities to be monitored and ground vibration and noise survey to be done on a monthly basis after which the frequency can change to a quarterly basis if surrounding residents complain about activities. The feeder roads to be closed for traffic during blasting if required. Permanent ground vibration to be carried out at the abutting noise sensitive areas if required. Crushing activities to be monitored and noise survey to be done on a monthly basis after which the frequency can change to a quarterly basis. <p><u>Rehabilitation phase</u></p> <ul style="list-style-type: none"> Machinery with low noise levels which complies with the manufacturer's specifications to be used. Activities to take place during daytime period only. Noise monitoring on a quarterly basis. <p><u>Cumulative impact of the entire process</u></p> <p>Actively manage the process and noise and vibration impact assessment to determine compliance to the noise and vibration regulations and/or standards.</p> | |
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| | | | | <p>The following are the Environmental, Health and Safety Guidelines of the IFC of the World Bank, which should be taken into consideration during the construction, operational and rehabilitation phases of the project:</p> <ul style="list-style-type: none"> • Selecting equipment with lower sound power levels; • Installing silencers for fans; • Installing suitable mufflers on engine exhausts and compressor components; • Installing acoustic enclosures for equipment causing radiating noise; • Installing vibration isolation for mechanical equipment; • Re-locate noise sources to areas that are less noise sensitive, to take advantage of distance and natural shielding; • Taking advantage during the design stage of natural topography as a noise buffer; • Develop a mechanism to record and respond to complaints. <p>Blasts must be designed in such a manner that ground vibration and over pressure levels are adhered to. In order to comply with the above, the following measures should be implemented:</p> <ul style="list-style-type: none"> • A scheme of vibration and air over pressure monitoring to be implemented; • A scheme by which air over pressure is controlled; • Days and times of blasting operations to be established; • Ensure that the correct design relationship exists between burden, spacing and hole diameter; • Ensure the maximum amount of explosive on any one-day delay interval, the maximum instantaneous charge, is optimized by considering; | |
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| | | | | <ul style="list-style-type: none"> • Reduce the number of holes per detonator delay interval; • Reduce the instantaneous charge by in-hole delay techniques; • Reduce the bench height or hole depth; • Reduce the borehole diameter. <p>Always attempt to minimize the resulting environmental effects of blasting operations and to recognize the fact that the perception of blasting events occurs at levels of vibration well below those necessary for the possible onset of the most cosmetic of damage; but nevertheless at levels that can concern occupants abutting the mining area;</p> <p>Be aware that relatively small changes in blast design can produce noticeable differences in environmental emissions and that it is very often in response to changes in these emissions rather than their absolute value that complaints may be made.</p> <p>Scheme of vibration monitoring may include the following:</p> <ul style="list-style-type: none"> • The location and number of monitoring points; • The type of equipment to be used and the parameters to be measured; • The frequency of monitoring; • The method by which such data are made available to management; • The method by which such data are used in order to ensure that the site vibration limit is not exceeded and to mitigate any environmental effects of blasting. | |
| | Impact on potential cultural, heritage artefacts and fossils. | Heritage and Palaeontology | (construction and operation phase) | 1. Any finds must be reported to the nearest National Monuments office to comply with the National Heritage Resources Act (Act No 25 of 1999) and to DEA. | Minimisation of impacts to acceptable limits |

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| | | | | <ol style="list-style-type: none"> 2. Local museums as well as the South African Heritage Resource Agency (SAHRA) should be informed if any artefacts/ fossils are uncovered in the affected area. 3. The Contractor must ensure that his workforce is aware of the necessity of reporting any possible historical, archaeological or palaeontological finds to the ECO so that appropriate action can be taken. 4. Known sites should be clearly marked in order that they can be avoided. The work force should also be informed that fenced-off areas are no-go areas. 5. The ECO must also survey for heritage and palaeontological artefacts during ground breaking and digging or drilling. He/she should familiarise themselves with formations and its fossils or a palaeontologist should be appointed during the digging and excavation phase of the development. 6. All digging, excavating, drilling or blasting activities must be stopped if heritage and/or palaeontological artefacts are uncovered and a specialist should be called in to determine proper management, mitigation, excavation and/or collecting measures. 7. Any discovered artefacts or fossils shall not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted. Permits shall be obtained from SAHRA should the proposed site affect any world heritage/palaeontology sites or if any heritage/palaeontology sites are to be destroyed or altered. 8. Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the NHRA (Act No. 25 of 1999), Section 51. (1). | |
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| | | | | <p>9. If anything of Archaeological and/or paleontological significance is found during the construction and operational phase of the mine the following applies:</p> <ul style="list-style-type: none"> • NHRA 38(4)c(i) – If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (021 462 5402) must be alerted as per section 35(3) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule; • NHRA 38(4)c(ii) – If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (012 320 8490), must be alerted immediately as per section 36(6) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule; • NHRA 38(4)e – The following conditions apply with regards to the appointment of specialists: i) If heritage resources are uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA; | |
| Waste management | | Pollution | (construction and operation phase) | <p>Litter management</p> <p>1. Refuse bins must be placed at strategic positions to ensure that litter does not accumulate within the construction site.</p> | Minimisation of impacts to acceptable limits |

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| | | | | <ol style="list-style-type: none"> 2. The Contractor shall supply waste collection bins where such is not available and all solid waste collected shall be disposed of at registered/licensed landfill. 3. Good housekeeping practices should be implemented to regularly maintain the litter and rubble situation on the construction site. 4. If possible and feasible, all waste generated on site must be separated into glass, plastic, paper, metal and wood and recycled. An independent contractor can be appointed to conduct this recycling. 5. Littering by the employees of the Contractor shall not be allowed under any circumstances. The ECO shall monitor the neatness of the work sites as well as the Contractor campsite. 6. Skip waste containers should be maintained on site. These should be kept covered and arrangements made for them to be collected regularly. 7. All waste must be removed from the site and transported to a landfill site promptly to ensure that it does not attract vermin or produce odours. 8. Where a registered waste site is not available close to the construction site, the Contractor shall provide a method statement with regard to waste management. 9. A certificate of disposal shall be obtained by the Contractor and kept on file, if relevant. 10. Under no circumstances may solid waste be burnt on site. 11. All waste must be removed promptly to ensure that it does not attract vermin or produce odours. <p>Hazardous waste</p> <ol style="list-style-type: none"> 12. All waste hazardous materials must be carefully stored as advised by the ECO, and then disposed of offsite at a licensed landfill site, where practical. Incineration may be used where relevant. 13. Contaminants to be stored safely to avoid spillage. | |
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| | | | | <p>14. Machinery must be properly maintained to keep oil leaks in check.</p> <p>15. All necessary precaution measures shall be taken to prevent soil or surface water pollution from hazardous materials used during construction and any spills shall immediately be cleaned up and all affected areas rehabilitated.</p> <p>Sanitation</p> <p>16. The Contractor shall install mobile chemical toilets on the site.</p> <p>17. Staff shall be sensitised to the fact that they should use these facilities at all times. No indiscriminate sanitary activities on site shall be allowed.</p> <p>18. Toilets shall be serviced regularly and the ECO shall inspect toilets regularly.</p> <p>19. Toilets should be no closer than 50m or above the 1:100 year flood line from any natural or manmade water bodies or drainage lines or alternatively located in a place approved of by the Engineer.</p> <p>20. Under no circumstances may open areas, neighbours fences or the surrounding bush be used as a toilet facility.</p> <p>21. The construction of “Long Drop” toilets is forbidden, but rather toilets connected to the sewage treatment plant.</p> <p>22. Potable water must be provided for all construction staff.</p> <p>Remedial actions</p> <p>23. Depending on the nature and extent of the spill, contaminated soil must be either excavated or treated on-site.</p> <p>24. Excavation of contaminated soil must involve careful removal of soil using appropriate tools/machinery to storage containers until treated or disposed of at a licensed hazardous landfill site.</p> | |
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| | | | | <p>25. The ECO must determine the precise method of treatment for polluted soil. This could involve the application of soil absorbent materials as well as oil-digestive powders to the contaminated soil.</p> <p>26. If a spill occurs on an impermeable surface such as cement or concrete, the surface spill must be contained using oil absorbent material.</p> <p>27. If necessary, oil absorbent sheets or pads must be attached to leaky machinery or infrastructure.</p> <p>28. Materials used for the remediation of petrochemical spills must be used according to product specifications and guidance for use.</p> <p>29. Contaminated remediation materials must be carefully removed from the area of the spill so as to prevent further release of petrochemicals to the environment, and stored in adequate containers until appropriate disposal.</p> | |
| Water Use and Quality | Water pollution | Water | (construction and operation phase) | <p>Water Use</p> <p>1. Develop a sustainable water supply management plan to minimise the impact to natural systems by managing water use, avoiding depletion of aquifers and minimising impacts to water users.</p> <p>2. Water must be reused, recycled or treated where possible.</p> <p>Water Quality</p> <p>3. The quality and quantity of effluent streams discharged to the environment including stormwater should be managed and treated to meet applicable effluent discharge guidelines.</p> <p>4. Discharge to surface water should not result in contaminant concentrations in excess of local ambient water quality criteria outside a scientifically established mixing zone.</p> <p>5. Efficient oil and grease traps or sumps should be installed and maintained at refueling facilities,</p> | |

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| | | | | <p>workshops, fuel storage depots, and containment areas and spill kits should be available with emergency response plans.</p> <p>Stormwater</p> <ol style="list-style-type: none"> 6. The site must be managed in order to prevent pollution of drains, downstream watercourses or groundwater, due to suspended solids and silt or chemical pollutants. 7. Silt fences should be used to prevent any soil entering the stormwater drains. 8. Temporary cut off drains and berms may be required to capture stormwater and promote infiltration. 9. Promote a water saving mind set with construction/mining workers in order to Contractor ensure less water wastage. 10. Hazardous substances must be stored at least 40m from any water bodies on site to avoid pollution. 11. The installation of the stormwater system must take place as soon as possible to attenuate stormwater from the construction phase as well as the operation phase. 12. Earth, stone and rubble is to be properly disposed of, or utilized on site so as not to obstruct natural water path ways over the site. i.e. these materials must not be placed in stormwater channels, drainage lines or rivers. 13. There should be a periodic checking of the site's drainage system to ensure that the water flow is unobstructed. 14. If a batching plant is necessary, run-off should be managed effectively to avoid contamination of other areas of the site. Untreated runoff from the batch plant must not be allowed to get into the storm water system or nearby streams, rivers or erosion channels or dongas. <p>Groundwater resource protection</p> | |
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| | | | | <p>15. Process solution storage ponds and other impoundments designed to hold non fresh water or non-treated process effluents should be lined and be equipped with sufficient wells to enable monitoring of water levels and quality.</p> <p>Sanitation</p> <p>16. Adequate sanitary facilities and ablutions must be provided for construction workers (1 toilet per every 10 workers).</p> <p>17. The facilities must be regularly serviced to reduce the risk of surface or groundwater pollution.</p> <p>Concrete mixing</p> <p>18. Concrete contaminated water must not enter soil or any natural drainage system as this disturbs the natural acidity of the soil and affects plant growth.</p> <p>Public areas</p> <p>19. Food preparation areas should be provided with adequate washing facilities and food refuse should be stored in sealed refuse bins which should be removed from site on a regular basis.</p> <p>20. The Contractor should take steps to ensure that littering by construction/mining workers does not occur and persons should be employed on site to collect litter from the site and immediate surroundings, including litter accumulating at fence lines.</p> <p>21. No washing or servicing of vehicles on site.</p> | |
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F) IMPACT MANAGEMENT ACTIONS

(A description of impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (c) and (d) will be achieved).

| ACTIVITY Whether listed or not listed. (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.). | POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...) | MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) E.g. <ul style="list-style-type: none"> • Modify through alternative method. • Control through noise control • Control through management and monitoring Remedy through rehabilitation.. | TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or prospecting as the case may be. | COMPLIANCE WITH STANDARDS (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) |
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| Clearance of vegetation | Loss or fragmentation of habitats | Existing vegetation <ol style="list-style-type: none"> 1. Vegetation removal must be limited to the mining site. 2. Vegetation to be removed as it becomes necessary rather than removal of all vegetation throughout the site in one step. 3. No vegetation to be used for firewood. 4. Exotic and invasive plant species should not be allowed to establish, if the development is approved. 5. There should be a preconstruction walk-through of the development footprint/project site in order to locate individuals of plant species of conservation concern. A search and rescue exercise must be done to locate and relocate any protected species to a suitable and similar habitat where these plants can grow without any disturbance; 6. In case Camel Thorn or Shepherd's trees are found permits must be obtained from DAFF to remove these individuals. The contractor must apply for these permits in a phased manner as mining proceeds. Rehabilitation | Duration of operation | The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA. |

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| | | <p>7. Since it will be a quarry, the area will be sloped as far as possible and managed</p> <p>Demarcation of mining area</p> <p>8. All plants not interfering with mining operations shall be left undisturbed clearly marked and indicated on the site plan.</p> <p>9. The mining area must be well demarcated and no construction activities must be allowed outside of this demarcated footprint.</p> <p>10. Vegetation removal must be phased in order to reduce impact of construction mining.</p> <p>11. Site office and laydown areas must be clearly demarcated and no encroachment must occur beyond demarcated areas.</p> <p>12. Strict and regular auditing of the mining process to ensure containment of the mining and laydown areas.</p> <p>13. Soils must be kept free of petrochemical solutions that may be kept on site during construction/ mining. Spillage can result in a loss of soil functionality thus limiting the re-establishment of flora.</p> <p>Utilisation of resources</p> <p>14. Gathering of firewood, fruit, muti plants, or any other natural material onsite or in areas adjacent to the site is prohibited unless with prior approval of the ECO.</p> <p>Exotic vegetation</p> <p>15. Alien vegetation on the site will need to be controlled.</p> <p>16. The Contractor should be responsible for implementing a programme of weed control (particularly in areas where soil has been disturbed); and grassing of any remaining stockpiles to prevent weed invasion.</p> <p>17. The spread of exotic species occurring throughout the site should be controlled.</p> <p>18. Weed control measures must be applied to eradicate any noxious weeds (category 1a & 1b species) on disturbed areas.</p> <p>Herbicides</p> | | |
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| | | <p>19. Herbicide use shall only be allowed according to contract specifications. The application shall be according to set specifications and under supervision of a qualified technician. The possibility of leaching into the surrounding environment shall be properly investigated and only environmentally friendly herbicides shall be used.</p> <p>20. The use of pesticides and herbicides on the site must be discouraged as these impact on important pollinator species of indigenous vegetation.</p> <p>Fauna</p> <p>21. Rehabilitation to be undertaken as soon as possible after mining has been completed.</p> <p>22. No trapping or snaring to fauna on the construction/mining site should be allowed.</p> <p>23. No faunal species must be disturbed, trapped, hunted or killed by maintenance staff during any routine maintenance at the development.</p> <p>24. Any fauna threatened by the construction and operation activities should be removed to safety by the ECO or appropriately qualified environmental officer.</p> <p>25. All construction vehicles should adhere to a low speed limit (<30km/h) to avoid collisions with susceptible species such as snakes and tortoises.</p> <p>26. If trenches need to be dug for electrical cabling or other purposes, these should not be left open for extended periods of time as fauna may fall in and become trapped in them. Trenches which are exposed should contain soil ramps allowing fauna to escape the trench.</p> | | |
| Mining Stone aggregate (Gravel) and Stone Aggregate (From waste dump) – excavations | Loss of topsoil | <p>1. The Contractor should, prior to the commencement of earthworks determine the average depth of topsoil, and agree on this with the ECO. The full depth of topsoil should be stripped from areas affected by construction/mining and related activities prior to the commencement of major earthworks. This should include the building footprints, working areas and storage areas. Topsoil must be reused where possible to rehabilitate disturbed areas.</p> | Duration of operation | The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA. |

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| | | <ol style="list-style-type: none"> 2. Care must be taken not to mix topsoil and subsoil or any other material, during stripping. 3. The topsoil must be conserved on site in and around the pit/trench area. 4. Subsoil and overburden in the mining area should be stockpiled separately to be returned for backfilling in the correct soil horizon order. 5. If stockpiles are exposed to windy conditions or heavy rain, they should be covered either by vegetation or geofabric, depending on the duration of the project. Stockpiles may further be protected by the construction of berms or low brick walls around their bases. 6. Stockpiles should be kept clear of weeds and alien vegetation growth by regular weeding. 7. Where contamination of soil is expected, analysis must be done prior to disposal of soil to determine the appropriate disposal route. Proof from an approved waste disposal site where contaminated soils are dumped if and when a spillage/leakage occurs should be attained and given to the project manager. <p>Establish an effective record keeping system for each area where soil is disturbed for mining purposes. These records should be included in environmental performance reports, and should include all the records below.</p> <ul style="list-style-type: none"> • Record the GPS coordinates of each area. • Record the date of topsoil stripping. • Record the GPS coordinates of where the topsoil is stockpiled. • Record the date of cessation mining activities at the particular site. • Photograph the area on cessation of mining activities. • Record date and depth of re-spreading of topsoil. • Photograph the area on completion of rehabilitation and on an annual basis thereafter to show vegetation establishment and evaluate progress of restoration over time. | | |
| | Erosion | <ol style="list-style-type: none"> 1. An effective system of run-off control should be implemented, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion. | Duration of operation | The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, |

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| | | <ol style="list-style-type: none"> 2. Periodical site inspection should be included in environmental performance reporting that inspects the effectiveness of the run-off control system and specifically records the occurrence of any erosion on site or downstream. 3. Implement an effective system of run-off control, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion. 4. Monitor the area regularly after larger rainfall events to determine where erosion may be initiated and then mitigate by modifying the soil micro-topography and revegetation or soil erosion control efforts accordingly 5. Wind screening and stormwater control should be undertaken to prevent soil loss from the site. 6. The use of silt fences and sand bags must be implemented in areas that are susceptible to erosion. 7. Other erosion control measures that can be implemented are as follows: <ol style="list-style-type: none"> ○ Brush packing with cleared vegetation ○ Mulch or chip packing ○ Planting of vegetation ○ Hydroseeding/hand sowing 8. Sensitive areas need to be identified prior to construction/mining so that the necessary precautions can be implemented. 9. All erosion control mechanisms need to be regularly maintained. 10. Seeding of topsoil and subsoil stockpiles to prevent wind and water erosion of soil surfaces. 11. Retention of vegetation where possible to avoid soil erosion. 12. Vegetation clearance should be phased to ensure that the minimum area of soil is exposed to potential erosion at any one time. 13. Re-vegetation of disturbed surfaces should occur immediately after construction/mining activities are completed. This should be done through seeding with indigenous grasses. 14. No impediment to the natural water flow other than approved erosion control works is permitted. | | thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA. |
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| | | <p>15. To prevent stormwater damage, the increase in stormwater run-off resulting from construction/mining activities must be estimated and the drainage system assessed accordingly. A drainage plan must be submitted to the Engineer for approval and must include the location and design criteria of any temporary stream crossings.</p> <p>16. Stockpiles not used in three (3) months after stripping must be seeded/backfilled to prevent dust and erosion.</p> | | |
| . | Air Pollution | <p>Dust control</p> <ol style="list-style-type: none"> 1. Wheel washing and damping down of un-surfaced and un-vegetated areas. 2. Retention of vegetation where possible will reduce dust travel. 3. Clearing activities must only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas. 4. Damping down of all exposed soil surfaces with a water bowser or sprinklers when necessary to reduce dust. 5. The Contractor shall be responsible for dust control on site to ensure no nuisance is caused to the neighbouring communities. 6. A speed limit of 30km/h must not be exceeded on site. 7. Any complaints or claims emanating from the lack of dust control shall be attended to immediately by the Contractor. 8. Any dirt roads that are utilised by the workers must be regularly maintained to ensure that dust levels are controlled. <p>Odour control</p> <ol style="list-style-type: none"> 9. Regular servicing of vehicles in order to limit gaseous emissions. 10. Regular servicing of onsite toilets to avoid potential odours. <p>Rehabilitation</p> <ol style="list-style-type: none"> 11. Since it will be a quarry, the area will be sloped as far as possible and managed <p>Fire prevention</p> | Duration of operation | The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA. |

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| | | <p>12. No open fires shall be allowed on site under any circumstance. All cooking shall be done in demarcated areas that are safe and cannot cause runaway fires.</p> <p>13. The Contractor shall have operational fire-fighting equipment available on site at all times. The level of firefighting equipment must be assessed and evaluated through a typical risk assessment process.</p> | | |
| | Noise and Vibration | <p>1. The mining activities must aim to adhere to the relevant noise regulations and limit noise to within standard working hours in order to reduce disturbance of dwellings in close proximity to the development.</p> <p>2. Pans, power plants, crushers, workshops and other noisy fixed facilities should be located well away from noise sensitive areas. Once the proposed final layouts are made available by the Contractor(s), the sites must be evaluated in detail and specific measures designed in to the system.</p> <p>3. Truck traffic should be routed away from noise sensitive areas, where possible.</p> <p>4. Noise levels must be kept within acceptable limits.</p> <p>5. Noisy operations should be combined so that they occur where possible at the same time.</p> <p>6. Mine workers to wear necessary ear protection gear.</p> <p>7. Noisy activities to take place during allocated hours.</p> <p>8. Noise from labourers must be controlled.</p> <p>9. Noise suppression measures must be applied to all equipment. Equipment must be kept in good working order and where appropriate fitted with silencers which are kept in good working order. Should the vehicles or equipment not be in good working order, the Contractor may be instructed to remove the offending vehicle or machinery from the site.</p> <p>10. The Contractor must take measures to discourage labourers from loitering in the area and causing noise disturbance. Where possible labour shall be transported to and from the site by the Contractor or his Sub-Contractors by the Contractors own transport.</p> <p>11. Implementation of enclosure and cladding of processing plants.</p> | Duration of operation | The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA. |

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| | | <p>12. Applying regular and thorough maintenance schedules to equipment and processes. An increase in noise emission levels very often is a sign of the imminent mechanical failure of a machine.</p> <p>13. The possible noise and increased ground vibration during blasting and mine activities can however be controlled by means of approved acoustic screening measures, state of the art equipment, proper noise management principles, compliance to the Local Noise Regulations, and the International Finance Corporation's Environmental Health and Safety Guidelines.</p> <p>The following three primary variables should be considered when designing acoustic screening measures for the control of sound and/or noise:</p> <ul style="list-style-type: none"> • The source – Reduction of noise at the source; • The transmission path – Reduction of noise between the source and the receiver; • The receiver – Reduction of the noise at the receiver. <p><u>Construction phase</u></p> <ul style="list-style-type: none"> • Machinery with low noise levels that complies with the manufacturer's specifications to be used • Activities to take place during daytime period only. • Noise monitoring on a quarterly basis. • Crack survey at the abutting residential areas to be carried out when complaints are received <p><u>Operational phase</u></p> <ul style="list-style-type: none"> • Emergency generators to be placed in such a manner that it is 500m away from any residential area. • Drilling with drilling rig to be done in such a manner and must be 500m away from any residential area. • Noise monitoring to be done on a quarterly basis when complaints are received by surrounding residents. • Crushing activities to be monitored and noise survey to be done on a monthly basis after which the frequency can change to a quarterly basis. | | |
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| | | <ul style="list-style-type: none"> • Blasting to take place under controlled conditions and by using the safe blasting methods at all times. • A distance of 500m must be at all times maintained between the residential area, and the blast site and an earth berm of 10.0m to be erected in the vicinity of residential properties if surrounding residents complain about the activities. • A safe distance to be maintained at the OHP during blasting activities. • Blasting activities to be monitored and ground vibration and noise survey to be done on a monthly basis after which the frequency can change to a quarterly basis if surrounding residents complain about activities. • The feeder roads to be closed for traffic during blasting if required. • Permanent ground vibration to be carried out at the abutting noise sensitive areas if required. • Crushing activities to be monitored and noise survey to be done on a monthly basis after which the frequency can change to a quarterly basis. <p><u>Rehabilitation phase</u></p> <ul style="list-style-type: none"> • Machinery with low noise levels which complies with the manufacturer's specifications to be used. • Activities to take place during daytime period only. • Noise monitoring on a quarterly basis. <p><u>Cumulative impact of the entire process</u></p> <p>Actively manage the process and noise and vibration impact assessment to determine compliance to the noise and vibration regulations and/or standards.</p> <p>The following are the Environmental, Health and Safety Guidelines of the IFC of the World Bank, which should be taken into consideration during the construction, operational and rehabilitation phases of the project:</p> <ul style="list-style-type: none"> • Selecting equipment with lower sound power levels; • Installing silencers for fans; • Installing suitable mufflers on engine exhausts and compressor components; | | |
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| | | <ul style="list-style-type: none"> • Installing acoustic enclosures for equipment causing radiating noise; • Installing vibration isolation for mechanical equipment; • Re-locate noise sources to areas that are less noise sensitive, to take advantage of distance and natural shielding; • Taking advantage during the design stage of natural topography as a noise buffer; • Develop a mechanism to record and respond to complaints. <p>Blasts must be designed in such a manner that ground vibration and over pressure levels are adhered to. In order to comply with the above, the following measures should be implemented:</p> <ul style="list-style-type: none"> • A scheme of vibration and air over pressure monitoring to be implemented; • A scheme by which air over pressure is controlled; • Days and times of blasting operations to be established; • Ensure that the correct design relationship exists between burden, spacing and hole diameter; • Ensure the maximum amount of explosive on any one-day delay interval, the maximum instantaneous charge, is optimized by considering; • Reduce the number of holes per detonator delay interval; • Reduce the instantaneous charge by in-hole delay techniques; • Reduce the bench height or hole depth; • Reduce the borehole diameter. <p>Always attempt to minimize the resulting environmental effects of blasting operations and to recognize the fact that the perception of blasting events occurs at levels of vibration well below those necessary for the possible onset of the most cosmetic of damage; but nevertheless at levels that can concern occupants abutting the mining area;</p> | | |
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| | | <p>Be aware that relatively small changes in blast design can produce noticeable differences in environmental emissions and that it is very often in response to changes in these emissions rather than their absolute value that complaints may be made.</p> <p>Scheme of vibration monitoring may include the following:</p> <ul style="list-style-type: none"> • The location and number of monitoring points; • The type of equipment to be used and the parameters to be measured; • The frequency of monitoring; • The method by which such data are made available to management; • The method by which such data are used in order to ensure that the site vibration limit is not exceeded and to mitigate any environmental effects of blasting. | | |
| | Impact on potential cultural, heritage artefacts and fossils. | <ol style="list-style-type: none"> 1. Any finds must be reported to the nearest National Monuments office to comply with the National Heritage Resources Act (Act No 25 of 1999) and to DEA. 2. Local museums as well as the South African Heritage Resource Agency (SAHRA) should be informed if any artefacts/ fossils are uncovered in the affected area. 3. The Contractor must ensure that his workforce is aware of the necessity of reporting any possible historical, archaeological or palaeontological finds to the ECO so that appropriate action can be taken. 4. Known sites should be clearly marked in order that they can be avoided. The workforce should also be informed that fenced-off areas are no-go areas. 5. The ECO must also survey for heritage and palaeontological artefacts during ground breaking and digging or drilling. He/she should familiarise themselves with formations and its fossils or a palaeontologist should be appointed during the digging and excavation phase of the development. 6. All digging, excavating, drilling or blasting activities must be stopped if heritage and/or palaeontological artefacts are | Duration of operation | The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA. |

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| | | <p>uncovered and a specialist should be called in to determine proper management, mitigation, excavation and/or collecting measures.</p> <p>7. Any discovered artefacts or fossils shall not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted. Permits shall be obtained from SAHRA should the proposed site affect any world heritage/palaeontology sites or if any heritage/palaeontology sites are to be destroyed or altered.</p> <p>8. Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the NHRA (Act No. 25 of 1999), Section 51. (1).</p> <p>9. If anything of Archaeological and/or paleontological significance is found during the construction and operational phase of the mine the following applies:</p> <ul style="list-style-type: none"> • NHRA 38(4)c(i) – If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (021 462 5402) must be alerted as per section 35(3) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule; • NHRA 38(4)c(ii) – If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (012 320 8490), must be alerted immediately as per section 36(6) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule; • NHRA 38(4)e – The following conditions apply with regards to the appointment of specialists: i) If heritage resources are uncovered during the course of the development, a | | |
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| | | professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA; | | |
| Waste Management | | <p>Litter management</p> <ol style="list-style-type: none"> 1. Refuse bins must be placed at strategic positions to ensure that litter does not accumulate within the construction/mining site. 2. The Contractor shall supply waste collection bins where such is not available and all solid waste collected shall be disposed of at registered/licensed landfill. 3. Good housekeeping practices should be implemented to regularly maintain the litter and rubble situation on the construction/mining site. 4. If possible and feasible, all waste generated on site must be separated into glass, plastic, paper, metal and wood and recycled. An independent contractor can be appointed to conduct this recycling. 5. Littering by the employees of the Contractor shall not be allowed under any circumstances. The ECO shall monitor the neatness of the work sites as well as the Contractor campsite. 6. Skip waste containers should be maintained on site. These should be kept covered and arrangements made for them to be collected regularly. 7. All waste must be removed from the site and transported to a landfill site promptly to ensure that it does not attract vermin or produce odours. 8. Where a registered waste site is not available close to the construction/mining site, the Contractor shall provide a method statement with regard to waste management. 9. A certificate of disposal shall be obtained by the Contractor and kept on file, if relevant. 10. Under no circumstances may solid waste be burnt on site. 11. All waste must be removed promptly to ensure that it does not attract vermin or produce odours. | Duration of operation | The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA. |

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| | | <p>Hazardous waste</p> <p>12. All waste hazardous materials must be carefully stored as advised by the ECO, and then disposed of offsite at a licensed landfill site, where practical. Incineration may be used where relevant.</p> <p>13. Contaminants to be stored safely to avoid spillage.</p> <p>14. Machinery must be properly maintained to keep oil leaks in check.</p> <p>15. All necessary precaution measures shall be taken to prevent soil or surface water pollution from hazardous materials used during construction/mining and any spills shall immediately be cleaned up and all affected areas rehabilitated.</p> <p>Sanitation</p> <p>16. The Contractor shall install mobile chemical toilets on the site.</p> <p>17. Staff shall be sensitised to the fact that they should use these facilities at all times. No indiscriminate sanitary activities on site shall be allowed.</p> <p>18. Toilets shall be serviced regularly and the ECO shall inspect toilets regularly.</p> <p>19. Toilets should be no closer than 50m or above the 1:100 year flood line from any natural or manmade water bodies or drainage lines or alternatively located in a place approved of by the Engineer.</p> <p>20. Under no circumstances may open areas, neighbours fences or the surrounding bush be used as a toilet facility.</p> <p>21. The construction of “Long Drop” toilets is forbidden, but rather toilets connected to the sewage treatment plant.</p> <p>22. Potable water must be provided for all construction staff.</p> <p>Remedial actions</p> <p>23. Depending on the nature and extent of the spill, contaminated soil must be either excavated or treated on-site.</p> <p>24. Excavation of contaminated soil must involve careful removal of soil using appropriate tools/machinery to storage containers until treated or disposed of at a licensed hazardous landfill site.</p> | | |
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| | | <p>25. The ECO must determine the precise method of treatment for polluted soil. This could involve the application of soil absorbent materials as well as oil-digestive powders to the contaminated soil.</p> <p>26. If a spill occurs on an impermeable surface such as cement or concrete, the surface spill must be contained using oil absorbent material.</p> <p>27. If necessary, oil absorbent sheets or pads must be attached to leaky machinery or infrastructure.</p> <p>28. Materials used for the remediation of petrochemical spills must be used according to product specifications and guidance for use.</p> <p>29. Contaminated remediation materials must be carefully removed from the area of the spill so as to prevent further release of petrochemicals to the environment, and stored in adequate containers until appropriate disposal.</p> | | |
| Water Use and Quality | Water pollution | <p>Water Use</p> <p>1. Develop a sustainable water supply management plan to minimise the impact to natural systems by managing water use, avoiding depletion of aquifers and minimising impacts to water users.</p> <p>2. Water must be reused, recycled or treated where possible.</p> <p>Water Quality</p> <p>3. The quality and quantity of effluent streams discharged to the environment including stormwater should be managed and treated to meet applicable effluent discharge guidelines.</p> <p>4. Discharge to surface water should not result in contaminant concentrations in excess of local ambient water quality criteria outside a scientifically established mixing zone.</p> <p>5. Efficient oil and grease traps or sumps should be installed and maintained at refueling facilities, workshops, fuel storage depots, and containment areas and spill kits should be available with emergency response plans.</p> <p>Stormwater</p> | | |

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| | | <p>6. The site must be managed in order to prevent pollution of drains, downstream watercourses or groundwater, due to suspended solids and silt or chemical pollutants.</p> <p>7. Silt fences should be used to prevent any soil entering the stormwater drains.</p> <p>8. Temporary cut off drains and berms may be required to capture stormwater and promote infiltration.</p> <p>9. Promote a water saving mind set with construction/mining workers in order to Contractor ensure less water wastage.</p> <p>10. New stormwater construction must be developed strictly according to specifications from engineers in order to ensure efficiency.</p> <p>11. Hazardous substances must be stored at least 20m from any water bodies on site to avoid pollution.</p> <p>12. The installation of the stormwater system must take place as soon as possible to attenuate stormwater from the construction phase as well as the operation phase.</p> <p>13. Earth, stone and rubble is to be properly disposed of, or utilized on site so as not to obstruct natural water path ways over the site. i.e. these materials must not be placed in stormwater channels, drainage lines or rivers.</p> <p>14. There should be a periodic checking of the site's drainage system to ensure that the water flow is unobstructed.</p> <p>15. If a batching plant is necessary, run-off should be managed effectively to avoid contamination of other areas of the site. Untreated runoff from the batch plant must not be allowed to get into the storm water system or nearby streams, rivers or erosion channels or dongas.</p> <p>Groundwater resource protection</p> <p>16. Process solution storage ponds and other impoundments designed to hold non fresh water or un-treated process effluents should be lined and be equipped with sufficient wells to enable monitoring of water levels and quality.</p> <p>Sanitation</p> | | |
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| | | <p>17. Adequate sanitary facilities and ablutions must be provided for construction workers (1 toilet per every 10 workers).</p> <p>18. The facilities must be regularly serviced to reduce the risk of surface or groundwater pollution.</p> <p>Concrete mixing</p> <p>19. Concrete contaminated water must not enter soil or any natural drainage system as this disturbs the natural acidity of the soil and affects plant growth.</p> <p>Public areas</p> <p>20. Food preparation areas should be provided with adequate washing facilities and food refuse should be stored in sealed refuse bins which should be removed from site on a regular basis.</p> <p>21. The Contractor should take steps to ensure that littering by construction workers does not occur and persons should be employed on site to collect litter from the site and immediate surroundings, including litter accumulating at fence lines.</p> <p>22. No washing or servicing of vehicles on site.</p> | | |
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Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including

G) MONITORING OF IMPACT MANAGEMENT ACTIONS

H) MONITORING AND REPORTING FREQUENCY

I) RESPONSIBLE PERSONS

J) TIME PERIOD FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS

K) MECHANISM FOR MONITORING COMPLIANCE

| SOURCE ACTIVITY | IMPACTS REQUIRING MONITORING PROGRAMMES | FUNCTIONAL REQUIREMENTS FOR MONITORING | ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES) | MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS |
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| Clearance of vegetation | Loss or fragmentation of habitats | <ul style="list-style-type: none"> Conduct regular internal audits Conduct regular external audits | <ul style="list-style-type: none"> Environmental Manager Suitable qualified environmental auditor | Monitoring should be undertaken for duration of operations. Internal audits should be undertaken at least every 6 months. External audits should be undertaken by a suitably qualified auditor on an annual basis. Reports should be made available to the competent authority if required. |
| Mining of the applied for minerals | Loss of topsoil Erosion Air Pollution Noise Impact on potential cultural, heritage artefacts and fossils | <ul style="list-style-type: none"> Conduct regular internal audits Conduct regular external audits | <ul style="list-style-type: none"> Environmental Manager Suitable qualified environmental auditor | Monitoring should be undertaken for duration of operations. Internal audits should be undertaken at least every 6 months. External audits should be undertaken by a suitably qualified auditor on an annual basis. Reports should be made available to the competent authority if required. |
| Waste management | Pollution | <ul style="list-style-type: none"> Conduct regular internal audits Conduct regular external audits | <ul style="list-style-type: none"> Environmental Manager Suitable qualified environmental auditor | Monitoring should be undertaken for duration of operations. Internal audits should be undertaken at least every 6 months. External audits should be undertaken by a suitably qualified auditor on an annual basis. Reports should be made available to the competent authority if required. |
| Water Use and Quality | Water pollution | <ul style="list-style-type: none"> Conduct regular internal audits Conduct regular external audits | <ul style="list-style-type: none"> Environmental Manager Suitable qualified environmental auditor | Monitoring should be undertaken for duration of operations. Internal audits should be undertaken at least every 6 months. External audits should be undertaken by a suitably qualified auditor on an annual basis. Reports should be made available to the competent authority if required. |

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| | | | | qualified auditor on an annual basis. Reports should be made available to the competent authority if required. |
| Blasting | Noise and Blasting vibrations | <ul style="list-style-type: none"> • Conduct regular internal audits • Conduct regular external audits | <ul style="list-style-type: none"> • Environmental Manager • Suitable qualified environmental auditor | <p>A monitoring programme for recording blasting operations is recommended.</p> <p>The following elements should be part of such a monitoring system:</p> <ul style="list-style-type: none"> • Ground vibration and Airblast results. • Blast information summary. • Meteorological information at time of blast. • Video Recording of blast if possible. • Fly rock observations |

L) CATE THE FREQUENCY OF THE SUBMISSION OF THE PERFORMANCE ASSESSMENT REPORT.

External audits should be undertaken by a suitably qualified auditor on an annual basis. Reports should be made available to the Competent Authority if required.

M) ENVIRONMENTAL AWARENESS PLAN

- 1. Manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work.**

GCG Crushers CC will implement an Environmental Awareness Plan which will include various mechanisms for informing employees of environmental risks resulting from their work, including:

- Induction training for full –time staff and contractors;
- In-house training sessions to be held with relevant employees;
- On the job training regarding environmental issues
- Training and skills development

The above measures will be implemented through an Environmental Communication Strategy to be implemented.

See the attached **Appendix 10** for the Awareness plan

- i. Manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment.**

GCG Crushers CC will implement an incident reporting and reporting procedure in order to identify risks timeously and implement actions to avoid or minimise environmental impacts.

N) SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

(Among others, Confirm that the financial provision will be reviewed annually).

No specific information requirements have been detailed by the Competent Authority.

-END OF THE REPORT-