TSHIKOVHA GREEN &
CLIMATE CHANGE ADVOCATES (PTY) LTD

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2020

ENVIRONMENTAL IMPACT REPORT AND ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT FOR AMENDMENTS TO LICENCED ACTIVITIES ASSOCIATED WITH GIZA MINERALS UNDERGROUND MINE IN BENONI, GAUTENG PROVINCE

PREPARED FOR GIZA MINERALS (PTY) LTD.

DATE: JULY 2020

Most projects and services delivery programmes are delayed. It is frustrating for both communities and developers. Environmental Authorization is the key to development. At Tshikovha Green and Climate and Change Advocates, we review projects scopes and advise on environmental requirements. Our business is to conduct Environmental Studies to apply for Environmental Approvals. We exist to ease your pain and frustrations. When working with us, not only we do our best to achieve positive results that solves client problems, but we also create platform for graduate's employment through our Inservice training.

We are a guide to our Clients Environmental problems, and we provide a Plan that helps clients Act on their challenges in a manner that will lead to a success. When facing Environmental challenge, we are able to respond within reasonable timeline to assist. We have been successful in all applications we have done since we existed. We are passionate our work and efforts to get results and through collaboration with specialists' teams and clients, we can win.

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mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

ENVIRONMENTAL IMPACT REPORT AND ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT FOR AMENDMENTS TO LICENCED ACTIVITIES ASSOCIATED WITH GIZA MINERALS MINE IN BENONI, GAUTENG PROVINCE.

DMR Reference Number: GP30/5/1/2/2(10057) MR

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED).

NAME OF APPLICANT: GIZA MINERALS (PTY) LTD TEL NO:078 822 5260

FAX NO:

POSTAL ADDRESS: 146 Western Road, Woodmead 2491

PHYSICAL ADDRESS: 146 Western Road, Woodmead 2491

FILE REFERENCE NUMBER SAMRAD: GP30/5/1/2/2(10057) MR

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Document Reference:	TGCCA-07-2020
Document Status:	Draft Environmental Management Programme Report
Prepared by:	Tracy Nkhwashu
Reviewed	Moudy Mudzielwana
Date Issued:	July 2020

1. 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 theenvironment".

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 a 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.

OBJECTIVE OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

The objective of the environmental impact assessment process is to, through a consultative process—

(a) determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;

(b) describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;

(c) identify the location of the development footprint within the preferred site based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;

(d) determine the—-

(i) nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and

(ii) degree to which these impacts—

(aa) can be reversed;

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

(e) identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;

(f) identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity;

(g) identify suitable measures to manage, avoid or mitigate identified impacts; and

(h) identify residual risks that need to be managed and monitored.

Table of Contents

PART A

SCOPE OF ASSESSMENT AND ENVIRONMENTAL IMPACT ASSESSMENT REPORT

1. Contact Person and Correspondence address

1.2 Details of the EAP

Name of the Practitioner: Tracy Nkhwashu

Tel No. 012 343 9820

Fax No: 086 600 1016

Email: tracy.nkwashu@tshikovha.co.za

1.3 Expertise of the EAP

Ms. Tracy Nkhwashu

Miss Tracy Nkhwashu is an Environmental Impact Assessment Practitioner at Tshikovha Green and Climate Change Advocates. She possesses a BSc Life and Environmental science degree obtained from the University of Johannesburg in 2017, and she currently enrolled for honours in Environmental Management with the University of South Africa.

Miss Nkhwashu completed her internship at Mulinda Environmental Consulting 2018 in 2018 she joined Plantago Lanceolata (Pty) Ltd. As a junior Environmental Practitioner., where she gained experience in Environmental Impact Assessment. Miss Tracy has experience in compiling EIA reports both Basic Assessments and Scoping reports. The first project I was involved in was the construction of Sebokeng U- Street Bridge and Storm water Channel which required a Basic Assessment report; I was heading the full project from application for an environmental authorisation, Public Participation Process to drafting the Environmental Management Plan. During the process of this project I learnt that EIA is more than writing reports but it's more of understanding the environment that the proposed project will be. Second Project was Construction of Tshakhuma Mall which required a Basic assessment and I also headed the project from initial stage to final stage. During this project I learnt that engaging the community on the project that is coming into their area is very important for you get the knowledge of the environment you working on, and that using tools such as Google earth and BGIS gives a lot of information about the type of vegetation that can/or occur at the site of the project you working on.

Mr Moudy Mudzielwana

Moudy Mudzielwana, managing director of Tshikovha Environmental and Communication Consulting, is a versatile entrepreneur armed with vast experience and expertise in variety of fields. Mudzielwana, who boasts several qualifications from several institutions, is an environmentalist, communication strategist, philanthropist and an ardent academic.

Prior to founding Tshikovha Environmental and Communication Consulting, one of the leading companies in South Africa's environmental sector, Mr Mudzielwana worked his way up from humble beginnings. After graduating at

University of Venda for Science and Technology, where he obtained a Bachelor of Environmental Sciences degree, Mr Mudzielwana worked at Butterfield Bakery in Roodepoort, Johannesburg.

It was there where he learnt a principle of always delivering quality something that has been one of the cornerstones of his business endeavours. His next stop was at Caxton, where he doubled as a newspaper street salesperson and a Cadet reporter for Roodeport Record and Krugersdorp News. This was after he underwent Cadet Reporting training at Caxton. After spending some years as a journalist, Mr Mudzielwana finally made a breakthrough when he landed a job in the environmental sector, where his passion lies. He worked for Environmental Management Services, an environmental consulting firm. This accorded him an opportunity to work on environmental projects and remediation of contaminated sites all over the country. He was a supervisor at Enviro-Fill where he managed landfill sites and developed waste management strategies.

Mr Mudzielwana, who hails from Tshixwadza Village at Ha Rambuda in Limpopo, would embark on yet another journey in pursuit of one of his passions – communication. He worked for Zitholele Consulting in Midrand, where his technical writing and communication skills were nurtured. As someone that loves growth and development, he then moved to BKS (now AECOM) in Pretoria where he was project leader. He would join Synergistics where he did mine projects for the company. He has also worked for PDNA, EnviroServ and Pangaea Worley Parsons. Even while on the employ of several companies, Mr Mudzielwana has never stopped equipping himself. His commitment to personal development has seen him acquire knowledge and skills through studying with various institutions. Here are some of the qualifications he acquired:

- Communication and Presentation Skills (Maurice Kerrigan)
- Authentic Leadership at Maurice Kerrigan
- Communication Planning: Institute of Journalism
- Technical Report Writing at Maurice Kerrigan
- Emotional intelligence at Maurice Kerrigan
- Communication Science (Southern Science)
- Impact Assessment (University of North West)
- Integrated Waste Management Planning (University of North West)
- Environmental Law (WESSA)
- Environmental Sustainability Reporting (Environmental and Sustainability Solution)
- Project Management (Golder & Associates)
- Environmental Due Diligence (Golder & Associates)

Currently, Mr Mudzielwana is studying Neuro Linguistic Programme at Lets Live Coaching and master's in business administration at Regenesys Business School. Through several CSI projects, he also helps underprivileged youth to further their studies. Mudzielwana also does mentoring and coaching for upcoming businesspeople and the youth in general. Under his tutelage Tshikovha Environmental and Communication Consulting has grown in leaps

and bounds. Not only has Mudzielwana led his company to delivering big projects for various clients but also directed the company in path of excellence. Tshikovha Environmental and Communication Consulting has achieved several accolades including Nkangala Small Business of the year 2014, Best Sales Company at Action Coach 2014 and Entrepreneur of the Year in 2015 at Tshwane Business Awards. Mr Mudzielwana has adopted Ratshilumela Secondary School where he studied and plans to assist with programmes that will enhance school operation and student development

1.4 The qualification of the EAP

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

1.5 Summary of the EAP's Past Experience.

(Attach the EAP's Curriculum Vitae as **Appendix 2)**

2. Description of the property

Table 1: Property Description

Farm Name:	Portion 1 of the farm Modderfontein 76 IR	
Application area (Ha)	70 Ha	
Magisterial district:	Benoni	
Distance and direction from nearest town	The project area is situated approximately 5km outside Benoni Town and 30km east of Johannesburg	
21-digit Surveyor General Code for each farm portion	T0IR00000000007600001	
Site coordinates		
Point	**Y**	**X**
A	62831.10	2897435.90
B	62679.04	897458.74
C	62540.67	2897505.86
D	62375.88	2897616.75
E	62188.70	2897616.75
F	62140.08	2897635.55
G	62093.22	2897625.95
H	62079.72	2897659.51
J	61892.37	2897731.30

K	61600.98	2897786.58
L	61368.18	2897803.70
M	62293.52	2898536.98
N	62303.76	2898524.05
P	62472.37	2898577.69
Q	62515.58	2898656.49
R	62956.12	2898643.24
S	62978.63	2898753.75
T	63350.71	2898726.77
U	63374.33	2898591.49
V	63317.24	2898578.96
W	63338.31	2898477.43
X	63111.37	2898431.16
Y	63172.42	2898140.43
Z	63086.99	2898122.50
1A	63103.55	2898045.39
1B	63154.00	2897918.19
1C	63154.62	2897847.46
1D	62570.15	2897847.46
1E	62570.15	2897559.15
1F	62839.98	2897557.15

3. Locality Map

(Show nearest town, scale not smaller than 1:250000). Attached as Appendix 3

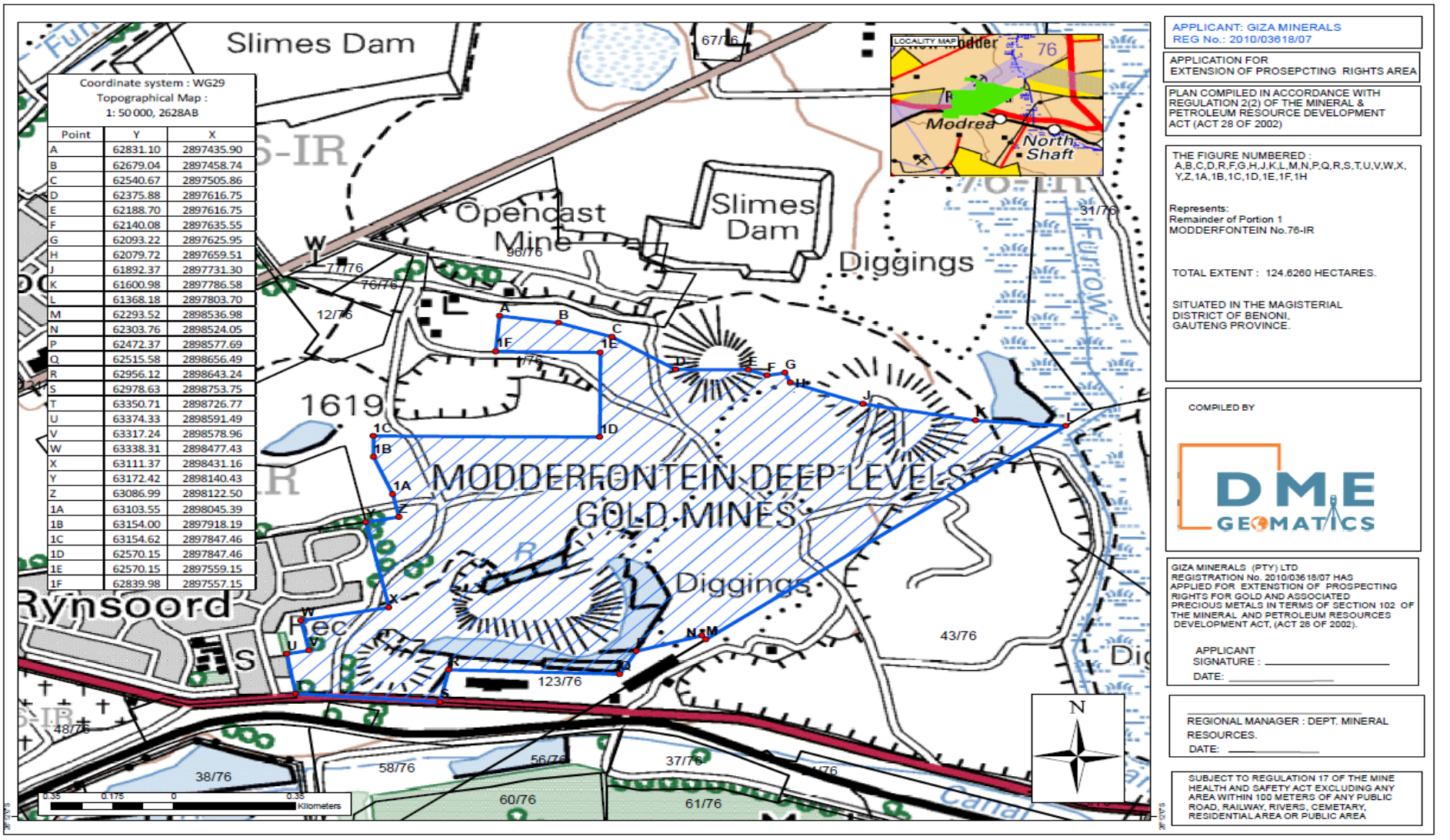


Figure 1: Locality Map

4. Description of the scope of the proposed overall activity.

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

4.1 Listed and specified activities

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

Table 2: Trigger Activities

NAME OF ACTIVITY (All activities including activities 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.)	**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)/NOT LISTED***	**WASTE MANAGEMENT AUTHORIZATION (Indicate whether an authorization is required in terms of Waste Management Act) (Mark with an X)**
Underground mining of gold mineral	70.955 Ha	X	GNR 325 Listing Notice 2 Activity 17, Any activity including the operation of that activity which requires a mining right as contemplated in section 22 of the Mineral and Petroleum Resources	

			Development Act, 2002 (Act No. 28 of 2002), including— (a) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource	
Cyanide storage tanks	+/- 500m^3	X	GNR 326	X
Diesel storage tanks	+/- 25m^3	N/A	N/A	N/A
Waste regulations category B of 2013: Triggered Activities				
Stockpiling	2 Ha	X	GNR 633 Category B Activity 7; The disposal of any quantity of hazardous waste to land	X

4.2 Description of the activities to be undertaken

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

Giza Minerals intends to undertake underground mining of gold on portion 1 of farm Modderfontein 76 IR in the magisterial district of Benoni, Ekurhuleni Metropolitan Municipality, Gauteng Province. The proposed mining activity will extend to an area of approximately 70.955 Ha underground. The proposed construction activities will entail the following:

- Access roads
- Offices
- Water tanks

The proposed project entails the underground mining of gold on the 70.955 hectares of land on portion 1 of the farm Modderfontein 76 IR of which Giza Minerals. The underground mining will follow the below process:

Underground Mining

- Loading and hauling of gold ore to the processing plant
- Storage of waste residues before processing

Waste Management

- Hauling of discarded waste materials to a deposition area owned by Gold Plates
- Disposal of sludge into the slurry dams

5 Policy and Legislative

Table 3: Applicable Legislation

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT(a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process);	REFERENCE WHERE APPLIED
The South African Constitution (Act 108 of 1996) constitutes the supreme law of the country and guarantees the right of all people in South Africa. Furthermore, the Bill of Rights (Chapter 2- Section 24 (a) (b) under the South African Constitution (Act 108 of 1996) emphasize that "Everyone has the right (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that- • Prevent pollution and ecological degradation; • Promote conservation; and • Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development"	Impact identification and Public Participation
National Environmental Management Act The NEMA (Act No.107 of 1998) amended Dec 2014, provides a framework for environmental law reform. The main objective of this act is to ensure that ecosystem services and biodiversity are protected and maintained for sustainable development. Furthermore, Section 28 (1) of the NEMA requires that "every person who causes has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring".	Provide management and mitigation measures for environmental impacts

Minerals and Petroleum Development Resources Act, (Act 28 of 2002) (MPRDA) and the MPRDA Amendment Act, Act 49 of 2008. The MPRDA makes provision for equitable access to and sustainable development of the nation's mineral and petroleum resources. The recent amendment MPRDA resulted in changes to align specific environmental legislation associated with mining activities and aligned sections of NEMA and MPRDA to provide for one environmental management system.	This Mining Right Application is in line with Section 16 of the MPRDA, thus Gauteng Department of Mineral Resources is the Competent Authority
The National Heritage Resources Act (NHRA), 1999 (Act No. 25 of 1999) provides for the management of national heritage resources to set norms and maintain national standards for the management of heritage resources in South Africa, and to protect heritage resources of national significance, so that heritage resources may be bequeathed to future generations. Section 35(4) of the NHRA related to archaeology, palaeontology, and meteorites, and states that: no person may, without a permit: (a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or paleontological site or any meteorite; (b) destroy, damage, excavate or remove from its original position, collect or own any archaeological material or paleontological material or object or meteorite; (c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or paleontological material or object; (d) Bring onto or use any equipment which assists in the detection or recovery of metals or archaeological and paleontological material or objects.	Though the footprint of the proposed activity has been previously disturbed, there has been illegal mining activities occurring on site, thus heritage assessment is of importance
The National Environmental Management: Air Quality Act, 2004 (Act no.39 of 2004) protects the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while providing justifiable economic and social development. The act also provides for national, provincial and local air quality standard	The proposed project will make use of vehicles for residue stockpile transportation that will result in emissions of Greenhouse gases. however, the project will emit low amount of harmful gases into the atmosphere that will not

	require an Air Emissions License
Occupational Health and Safety Act (OHS) 1993 (Act No.85 of 1993), helps to ensure the health and safety of all the employees, construction workers and any other person on site	Safety of the Employees
The National Environmental Management: Biodiversity Act (Act 10 of 2004) provides for the management and conservation of South Africa's biodiversity within the framework of NEMA, the protection of species and ecosystem that warrant national protection. As part of its implementation strategy, the National Spatial Biodiversity Assessment was established. The biodiversity Act further requires landowners to manage and conserve South Africa's biodiversity for current and future generations. The National Spatial Biodiversity Assessment classifies area worthy of protection based on their biophysical characteristics which are ranked according to priority levels.	Conservation of Biodiversity on site

6 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).

South Africa's economy is built on gold and diamond mining, the sector is an important foreign exchange earner, with gold accounting for more than one-third of exports. Gold mining around the Johannesburg area closed prematurely in early 2000. Despite these closure, significant mineable resources still remain within the application area. Giza Minerals over the last few years has been using historical data of the gold ore bed to target those spaces that were left unmined. Based on that data Giza Minerals has identified a feasible ore body that it believes is worth developing further. The further development of the project would allow for the rehabilitation of historically impacted land within the project footprints that was abandoned and not fully completed by previous mining companies.

Given its history and mineral wealth, it is no surprise that the country's mining companies are key players in the global industry. Its strengths include a high level of technical and production expertise, and comprehensive research and development activities. Furthermore, one of the main objectives for this project is to provide directly and indirectly boost to local economy provide employment to the surrounding. Furthermore, South Africa have limited land for residential development and this project will rehabilitate the slime dams and deep excavation to a point where such land can be used for residential purposes once the mineral is depleted and the project is closed.

7 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 not about the impact assessment itself; It is about the determination of the specific site layout having taken into consideration (1) the comparison of the originally proposed site plan, the comparison of that plan with the plan of environmental features and current land uses, the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout as a result.

The proposed site is an old gold mining area constituted by several gold dumps and illegal mining activities. Having processed the mining dumps before Giza Minerals propose to have underground mining on the same property as they have seen potential of a mineral bed that was left unmined underground by the old gold mining. Underground mining will promote employment and development of the area, and to a certain extent counter pollution and crime. No other alternative location was considered for the proposed activity. Above all, this area will be properly rehabilitated for future developments.

8. Description of process followed to reach preferred proposed site

8.1 Details of the development footprint alternatives considered.

With reference to the site plan provided as Appendix 4 and the location of the individual activities on site, provide details of the alternatives considered with respect to:

(a) the property on which or location where it is proposed to undertake the activity;
(b) the type of activity to be undertaken;
(c) the design or layout of the activity;
(d) the technology to be used in the activity;
(e) the operational aspects of the activity; and
(f) the option of not implementing the activity.

a. The property on which or location where it is proposed to undertake the activity;

The proposed site for this activity is on portion 1 of the farm Modderfontein 76 IR, within the magisterial district of Benoni, 5km away from Benoni city centre and 30km west of Johannesburg.

b. The typ

c.

d.

e.

f.

g. +e of activity to be undertaken;

i. Underground Mining of gold-Preferred

- Shaft decline, haulages, cross cuts and reef drives will be needed to access the gold bearing material. Development, raises and stopes will be used for ease of production. Most of this infrastructure is already in place and only needs to be rehabilitated.

- Scraper Winches will be used to clean the Ore from faces and mono winches with bags including light duty locos will be used to haul material to the decline. In the first phases bag Mining will predominately be used on the fourth year of preliminary production it is anticipated that normal conventional Mining will prevail.

- The underground operations will be ventilated as per recommendations of occupational hygiene professionals.

- Sub-station- to provide power to underground operations is already in place. It is forecasted that minimal electricity will be used underground.

- Water – the water will be obtained from the municipality, the water will be used for showers, ablution facilities and drinking water. The process water will be from already existing retention dams and will be re-used.

- Roads- these will not be constructed in the open traffic, but rather on the designated land on which the plant will be situated. Only the excess road from Main Reef will affect the surrounding community.

- Offices and workshops- these will house the office staff and be an environment for the maintenance of the underground equipment.

The underground mining method would be conventional drill and blast breast mining methods. The incline shafts, equipped with a winder house, would provide means for movement of men, material and rock to and from the underground workings. Ore drives would be developed on reef with raises developed from the drives. Loading boxes would be constructed and winches would be installed on the down-dip side of the raise to remove the broken rock from the stopes. Ore would be transported to the incline shafts by means of conventional track bound equipment. Ore would be stored for initial crushing before transportation off-site. Any waste rock produced by the underground mining operations would remain underground.

Advantages of mining gold underground:

- GIZA Minerals has an existing dumping site for the waste that has been already approved
- Gold mining companies are a major source of income and economic growth, with an important role in supporting sustainable socio-economic development.

- Although the price of gold can be volatile in the short term, it has always maintained its value over the long term
- Gold is extremely ductile, conducts electricity, doesn't stain, blends and alloys well with other metals and can be easily broke down to sheets and wires. Gold has an unparalleled shine and luster even in its most original form. Because of this gold can be used for the following:

(1) Dentistry and medicine (Gold is considered as the best filling for cavities and crowns, bridges and other orthodontic appliances because the metal is ductile and can easily take shapes. It is also chemically passive and doesn't react easily when missed with other metals. It is also easy to insert and is non-allergic. Dentists have used gold as the best substitute for misplaced/ dislocated teeth for ages)

(2) Electronics and Computers (Gold is able to carry electrical charges easily because it is a good conductor for electricity, this metal is found in small portions in many electrical devices like mobile phones. Television sets, GPS devices. It is also sometimes found in computers and laptops for transferring data quickly.

(3) Jewellery (Because of its shine, luster and durable properties, about 80% of gold is converted into jewellery. It is the most standard use of gold and is common amongst all cultures.

- Investments that companies make in training their workforce bring benefits to host nations and build human capital. Broader benefits can also be obtained when training provides skills that are transferable beyond the mine and enable workers to obtain employment in other industries should employment at the mine no longer be available, the breakdown of the training the Giza Minerals will provide to their employees is as follows
    1. Technical training
    2. Health & Safety training
    3. Environmental training
    4. Emergency response training
    5. Human rights training

Disadvantages of mining gold underground

- for the industry's processes to be economical, it has to rely on substantial volumes of material, as the material treated contains gold grades at below 0.4 g/t that produce relatively low quantities of product
- large capital expenditure for infrastructure and tailings deposition facilities
- gold ore waste contains pyrite and iron sulphide and when they react with the atmosphere, acid mine drainage can result
- Gold mining has ravaged landscapes
- Contaminated water supplies cause health problems
- Cyanide and other toxic substances are regularly released into the environment and contaminate soil, Vegetation, and water resources

h. The design or layout of the activity;

The current layout plan is considered as preferred, no other layout plan has been considered. **See Appendix 4**.

i. The technology to be used in the activity;

i. Cyanidation/ Leaching Process: Preferred

The ore is commuted using grinding machinery. Depending on the ore, it is sometimes further concentrated by froth flotation or by centrifugal (gravity) concentration. Water is added to produce a slurry or *pulp*. The basic ore slurry can be combined with a solution of sodium cyanide or potassium cyanide; however, many operations utilize calcium cyanide, which is more cost effective.

To prevent the creation of toxic hydrogen cyanide during processing, slaked lime (calcium hydroxide) or soda (sodium hydroxide) is added to the extracting solution to ensure that the acidity during cyanidation is maintained over pH 10.5 - strongly basic. Lead nitrate can improve gold leaching speed and quantity recovered, particularly in

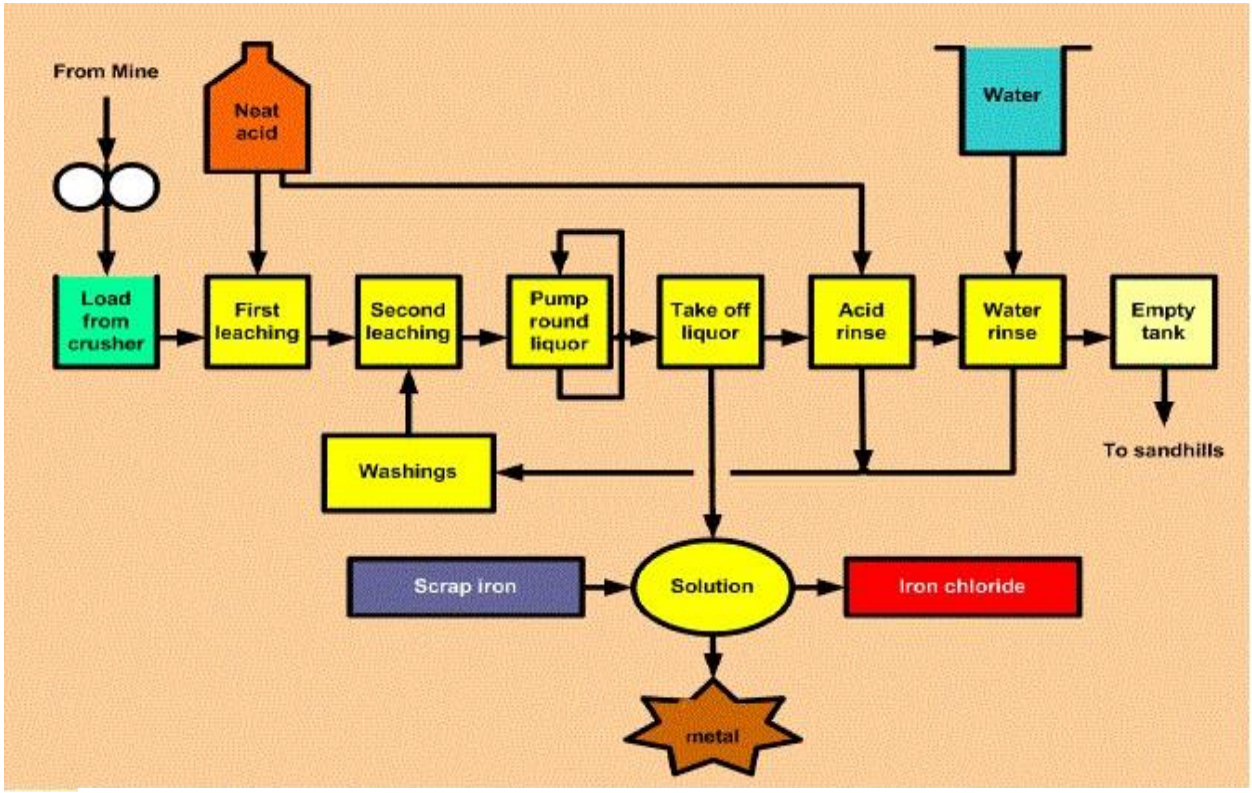


Figure 2: Cyanidation/Leaching.

processing partially oxidized ores.

Advantages:

- The process has been proven in numerous full-scale applications to yield low effluent cyanide and metals concentrations.

- The process is effective in treating slurries as well as solutions.
- The process is suitable for batch or continuous treatment.
- All forms of cyanide are removed from solution, including the stable iron cyanide complexes.
- Capital and operating costs are comparable with other chemical treatment processes.
- Undesirable levels of sulphate in the treated solution can result.
- Additional treatment may be necessary for the removal of iron cyanide, thiocyanate, cyanate, ammonia, nitrate and/or metals for solutions to be discharged to the environment

Disadvantaged:

- If treating high levels of cyanide, the costs for reagents and electrical power can be high.
- Cyanide is not recovered
- Undesirable levels of sulphate in the treated solution can result.
- Additional treatment may be necessary for the removal of iron cyanide, thiocyanate, cyanate, ammonia, nitrate and/or metals for solution to be discharged to the environment

j. The operational aspects of the activity; and

i) Heap Leaching

During this procedure, there is no pre-treatment of the sand other than mixing with lime for neutralization. The flow diagram shown in Figure 3 below depicts the process route for the recovery of gold in the heap-leaching plant of The Rand Leases Gold Mining Company, where sand is heap-leached in the 'as-is' state. The operation entails the addition of lime to each truckload of sand (about 10 kg of lime per ton of sand). The sand is then loaded by front-end loader to a height of 4 m on one of three slightly-inclined, impervious asphalt pads.

Each pad is 60 m long by 20 m wide, having an area of about 1200 m2, and each heap contains about 10 kt of material. While the heaps are being constructed, perforated pipes are laid on the floor of the pad across the width to assist in the drainage of the leach liquor from the bottom of the heap. Leaching solution containing lime and sodium cyanide, both at a concentration of 0.02%, is then sprayed onto the heaps at a rate of approximately 14 m3/h, which is equivalent to 0.2 l/min per square metre, or 0.005 U.S. gal/min per square foot. The solution percolates through the heap and gravitates to a pond. This pregnant solution is then pumped through adsorption stages containing granular activated carbon, which adsorbs the gold content. After the addition of leaching chemicals, the solution is re-circulated through the heap for between 20 and 40 days. After leaching, the 'barren' sand is de-slimed in a cyclone, and the resulting slime is pumped to a separate dam.

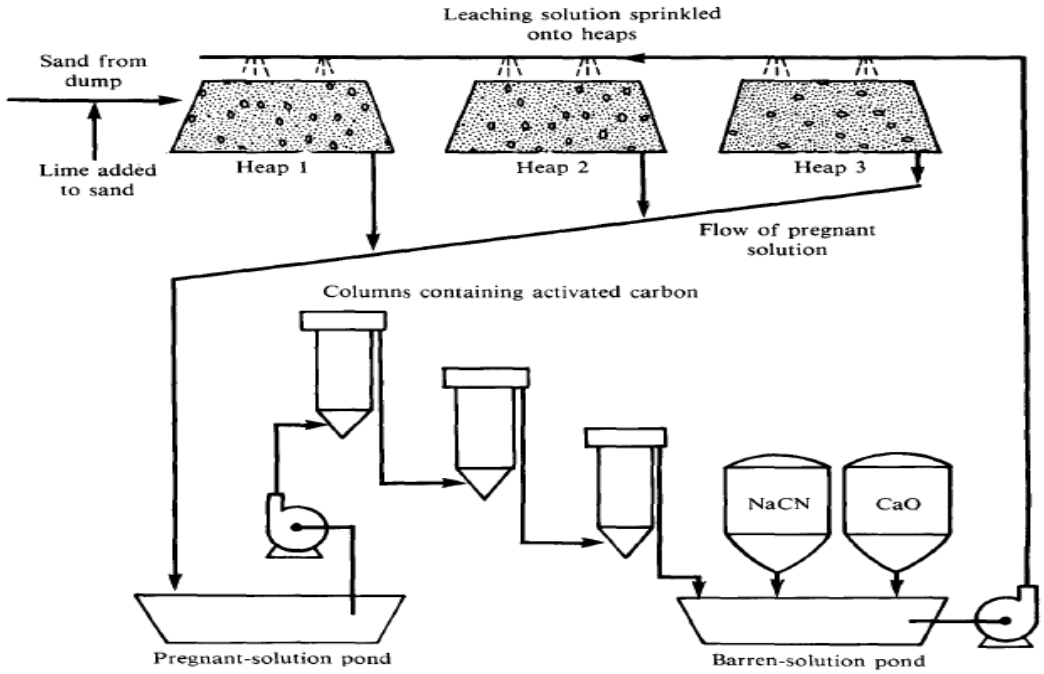


Figure 3: Flow sheet for the heap leaching plant at Rand Leases.

Advantages

- Lowering capital and operating expenses.
- Providing a rapid payback.
- Elimination of tailing disposal issues.
- Simplicity of design and equipment needed.
- Having fewer environmental issues than other processes.
- Faster construction phase than alternatives.
- Reduced energy and water requirements.
- Being applicable where low-grade ores and tailings are present
- Metal tenor may be built up by recycling solution over heaps
- Acid-mine drainage of wastes

Disadvantages

- Costs associated with pollution control and closure
- Civil society perceptions of heap leaching
- Impacts on the project water balance
- Impacts of potential exposure to process solution on people, livestock and wildlife
- Legislative and governance issues

ii. De-sliming-Alternative

The principle of de-sliming is illustrated in Figure 5 below, Sand is mixed with water and lime into a pulp with a pH value of about 10, thus achieving uniform neutralization of the acids and salts. The pulp is then aerated to oxidize ferrous iron to ferric iron, thus further reducing the consumption of cyanide and oxygen during leaching. The classification of the pulp into a sand fraction and a slime fraction facilitates the quick and efficient extraction of gold from the slime fraction by agitation leaching and the CIF process. The sand, now uniformly neutralized and rid of its fine material and deleterious salts, is more amenable to heap leaching. The amount of gold remaining in the heap after leaching should be lower than in the 'as is' method because of the high permeability of the material. However, the de-slimed wet sand now has a much lower angle of repose, and low precast walls may be necessary to contain the sides of the heap. Large-scale tests will be needed to indicate the stability of this material.

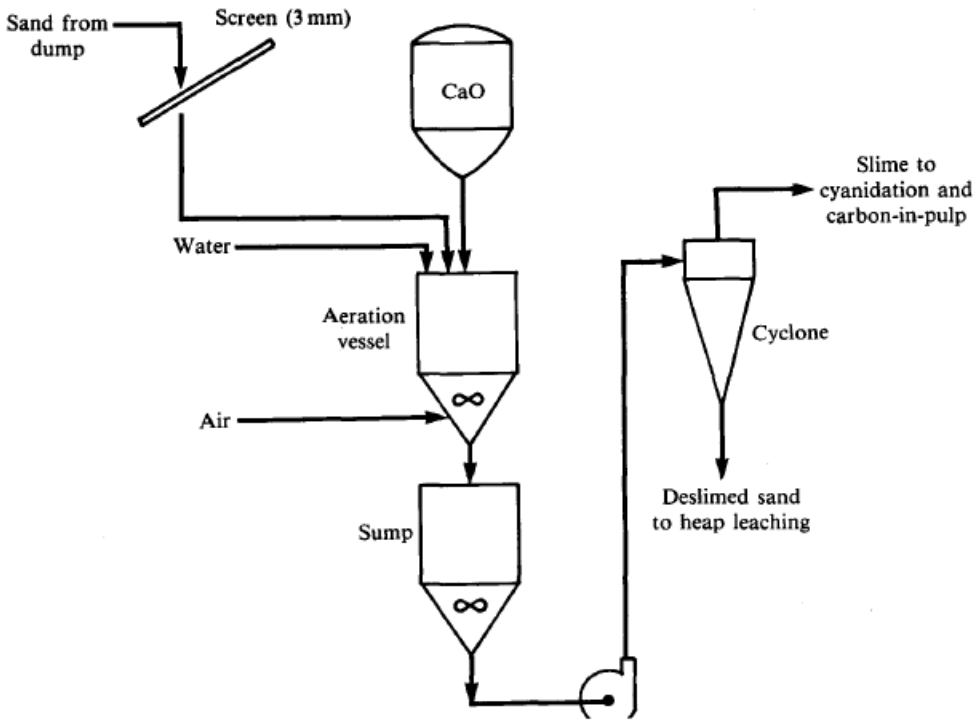


Figure 4: Postulated for the removal of slimes (de-sliming) from sand.

Advantages

- Much higher flow rate than a slow sand filter
- Requires relatively small land area
- Less sensitive to changes in raw water quality, e.g. turbidity

Disadvantages

- Requires greater maintenance than a slow sand filter. For this reason, it is not usually classed as an "appropriate technology," as the term is applied in less-developed countries.
- Generally ineffective against taste and odour problems.
- Produces large volumes of sludge for disposal.
- Requires on-going investment in costly flocculation reagents.

k. The Option of Not Implementing the Activity

This option, also known as the No-Go option, entails no contribution to the local economy and betterment of the local people in terms of financial and skills development stance. The development of this project will contribute towards provision on sustained employment opportunities. The area has been widely prospected and the results thereof are compatible with the other existing mining operations in the area. The no-go option implies that the mineral resources proven to be on the ground will be sterilized if not mined. This can be regarded as an economic opportunity loss.

Hauling of discarded waste materials to a deposition area owned by Gold Plates is going to help in rehabilitation of a hole and the area so that the municipality can use the land for residential purposes

8.2. Details of the Public Partition 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)4.

The following steps have been undertaken thus far as part of the public participation process in order to notify interested and affected parties:

a) Potential Interested and Affected Parties (I&APs) have been identified through the use of an existing I&AP database. The existing database includes landowners, neighbouring landowners, community members and non-governmental organisations (NGOs) who have participated in previous EIA processes in the area.
b) Newspaper advertisements have been placed in the relevant local newspaper.

8.3. Summary of issues raised by I&APs

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

COMMENTS MADE BY STAKEHOLDER AND INTERESTED AND AFFECTED PARTIES				
ISSUE/COMMENT	**COMMENTOR**	**DATE OF COMMENT**	**MEANS OF COMMENTING**	**RESPONSE**
Had indicated that the problem with mining is that it has done nothing for this community (Rynsoord). Will the Giza Minerals be able to assist us, in when the community experiences the shaking of the ground and dust control? And said that they are not given a chance to have an input with regards to what happens during the mining process. Can they get compensation or even partner with the company? Is the mining site going to be well protected?	Mr.Azhar Essop	25/02/2020	Comment raised in the public meeting	Mr Mudzielwana: said with regards to the environmental impact issues, the community should get in contact with the right authorities. To answer if there will be any compensation from the company, it is best the community has a communication with the Applicant (Giza Minerals). Giza Minerals is committed to approved Social and Labour Plan and is not open for partnership as they have financial muscle to undertake this project. Air quality specialist will be conducted to ensure that dust is controlled and managed

Where is this Underground Mining location exactly?	Mr Jamal Raju	25/02/2020	Question asked in the public meeting	Mr. Mudzielwana. Close to Gold Plat/ Old Benoni Mine
What are the new activities is Giza Minerals looking at on the underground mining? Will they have blasting?	Yusuf Mayet	25/02/2020	Question asked in the public meeting	Lebo At this stage we are not considering blasting as there are already tunnels underground that runs towards the east which is the direction that the underground mining will take.

The issue with blasting, there is a concern that not only structures (Houses) that are taking a strain but the roads as well. So, with that regard I oppose the new activity of the Underground Mining due to the issues raised above	Mr N. Jivan	25/02/2020	Comment raised in the public meeting	<u>Mr. Mudzielwana</u> Noted.
Did DMR tell you to Mine Underground	Ahmed Essop	25/02/2020	Comment raised in the public meeting	<u>Lebo</u> No, but with the problem of illegal miners and if Giza Minerals see a potential of Mining Underground why not use the opportunity.

How deep will the mine be underground?	Aboobiaker Shaik	25/02/2020	Comment raised in the public meeting	Lebo we are looking at 150 m from the surface
What type of minerals that will be mined?	Mr N. Jivan	25/02/2020	Comment raised in the public meeting	Lebo Gold remanence

With regards to Cyanide wont it affects our drinking water and the water table?	Jamal Raju	25/02/2020	Comment raised in the public meeting	During Processing Cyanide will not leave the site and it will also be neutralised on site
Please explain what Leaching Plant and what are the processes there and the impacts it poses.	Jamal Raju	25/02/2020	Comment raised in the public meeting	Leeching process involves dissolving of gold so it can be extracted in a liquid form

What type of chemicals are illegal Miners use to extract gold?	Ahmed Essop	25/02/2020	Comment raised in the public meeting	Lebo They normally use Mercury and also, they use water from sewer lines as they need high capacity of water for their operations
With dust what are the mitigation measures that will be taken?		25/02/ 202	Comment raised in the public meeting	Mr Mudzielwana Dust Monitoring devices will be used to monitor dust that is being produced and dust suppressing trucks will be used daily

What is the timeline of the Underground Mine		25/02/2020	Comment raised in the public meeting	Underground still at proposal stage, no timeline has been set yet, though surface mining will be for 7 years
With regards to security issues what plans do you have to make sure that the community is protected?	Mr.Azhar Essop	25/02/2020	Comment raised in the public meeting	The mine will ensure that the community is protected and this will be discussed further when we present the planning of the mine to the community

He has said that with these big environmental impacts. The measure of the impact to the area is too much and surely after exhorting it will be a battle for it to rehabilitate.	Mr N. Jivan	25/02/2020	Comment raised in the public meeting	Mr. Mudzielwana: Some of the points that he made was that there will be specialist that are able in assisting with regards to such. Giza Minerals aim to rehabilitate the sink hole that is not part of this application area.

8.4 The Environmental attributes associated with the development footprint alternatives. (The environmental attributed described must include socio-economic, social, heritage, cultural, geographical, physical and biological aspects)

8.4.1. Baseline Environment

(a) **Type of environment affected by the proposed activity.**

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

i. Geographical Environment

- Temperature

The temperature of an area is highly influenced by the geographic altitude and latitude. However, due to anthropogenic activities, the temperature of Gauteng Province is also influenced by man-made induced factors such are deforestation, urbanization, etc. According to data obtained from weather station at OR Tambo International Airport (ORTIA), Modderfontein mean daily maximum temperature is 14.7°C in January (mid-summer) and 4.1°C in June (midwinter). Furthermore, the climate of this region can be described as temperate, experiencing warm summers and cold winters with frost.

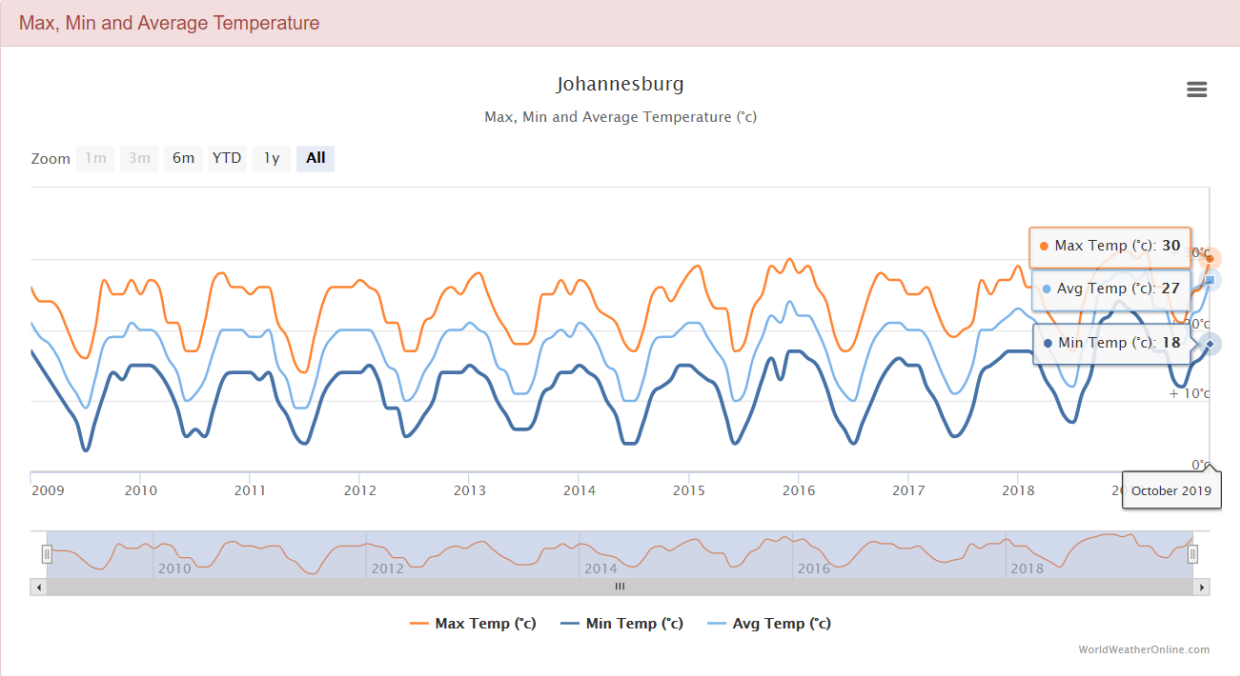


Figure 5: A graph showing the maximum, minimum and average temperature for Johannesburg for the past 10 years

- Precipitation

The precipitation for the region in which the proposed project falls was taken from the weather station at Johannesburg International Airport in Kempton Park i.e. OR Tambo International Airport (ORTIA), which is at an altitude of 1,694 metres above mean sea level situated 8 km south east of the Modderfontein. The long-term rainfall variations described in Table 4 are taken from data generated at the weather station over a period of 30 years (Schulze, 1986). The Average total annual rainfall in this region ranges in 718 mm. The study area falls within a summer rainfall region, with over 80% of the annual rainfall occurring during the October to March period

Table 4: Long Term Average Monthly Rainfall for the Period 1951-1984

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Max 24hr Rainfall	188	55	92	49	70	31	30	25	42	89	65	105	838
Ave rainfall (mm)	131	95	81	55	19	7	6	6	26	72	114	106	718
Ave no. of rain days	14.4	11.0	11.0	8.5	3.6	2.0	1.2	2.0	3.5	9.6	14.3	14.0	95.5

ii) Description of the watercourses within the Modderfontein area

The watercourses at Modderfontein comprise a mixture of perennial and seasonal streams and drainage lines that have been modified (in terms of quantity, quality and flow) by human activities such as mining, effluent and storm water discharges. The in-stream habitats of the Modderfontein Spruit comprise mostly pool-riffle types with the extent of the pools being largely dependent on back flooding from the dams. Overall, the riparian zone throughout appears to have low plant species diversity due to alien invasion and the influence of historical land-use practices. However, within the proposed site, there are no surrounding water bodies except varieties of depressions (Fig. 6) which store water during rainfall periods.

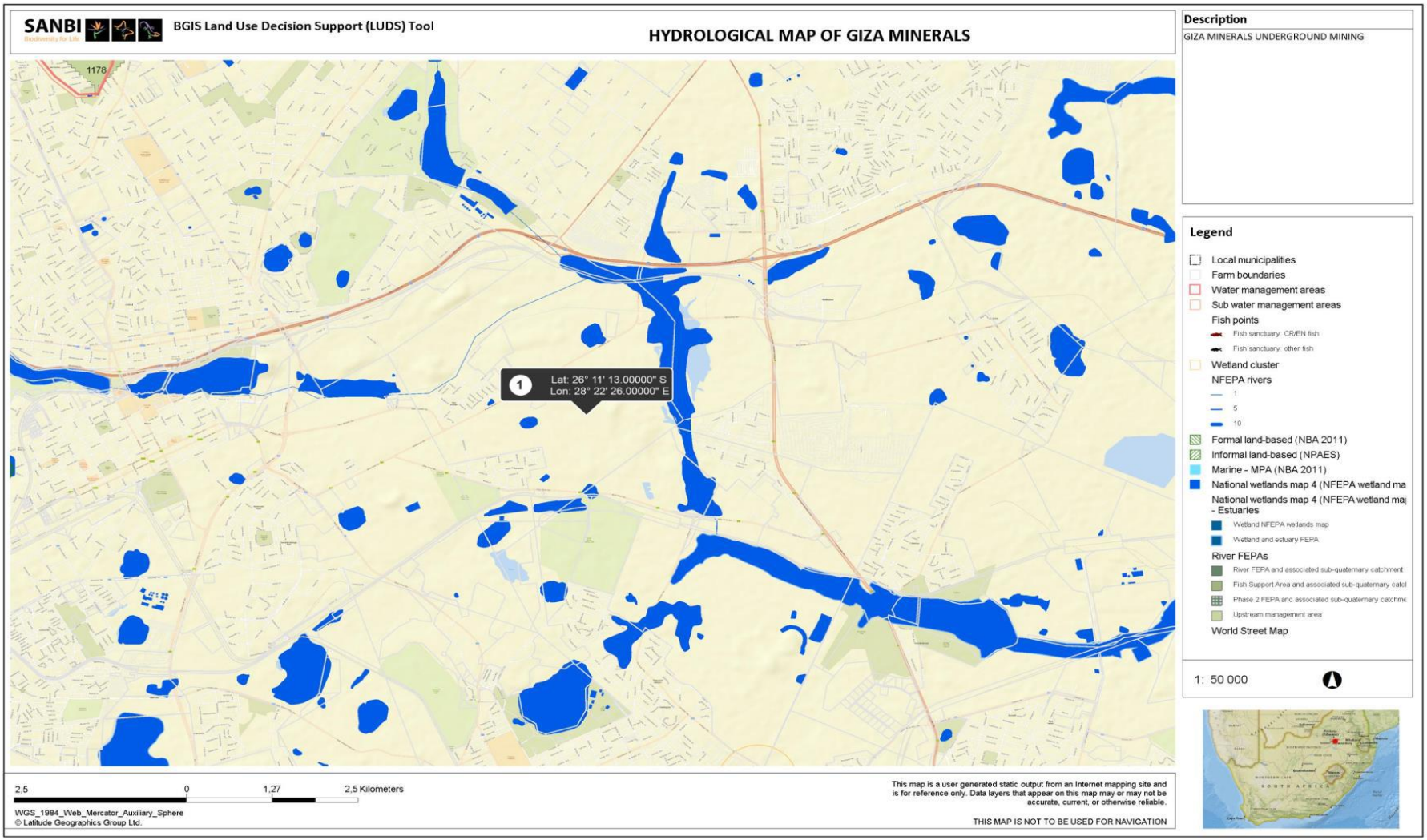


Figure 6: Hydrology Map

- **Topography**

Modderfotein is classified by strong undulating plains on a national scale. The site consists of a rolling landscape with an elevation that ranges from 1,565 metres above mean sea level in the south-west to 1,480 metres above mean sea level at the border of the site at Modderfontein Dam. It slopes predominantly in westerly direction towards the Modderfontein Spruit, which forms the western boundary of the site. The spruit runs in a northerly direction and feeds into the Jukskei River. However due to mining activities, the topography within the proposed site has been highly altered from its natural state.

- **Geology**

Data collection Information on the geology of the site was obtained from the land type map series and accompanying memoir published by the Department of Agriculture and Water Supply (1985). According to the land type series, the Modderfontein site falls within the Bb1 land type. The geology of this land type consists of granite and migmatite of the Halfway House Intrusion. This agrees with findings of the several studies of which found the geology of the area to comprise predominantly coarse to medium grained, resistant to poorly weathered granites and gneiss. Furthermore, the study found evidence of secondary intrusives in the form of diabase dykes and sills that cross cut the topography. These lithologies are moderately resistant in character, and produce predominantly shallow soils founded on poorly developed saprolitic horizons, underlain by hard rock.

- **Wind**

This baseline information used for wind variable in Moderfontein was obtained for Airshed atmospheric impact report undertaken in February 2015. During the reporting period, the wind field was dominated by winds from the north-westerly sector with an average wind speed of 1 m/s. Wind speeds of less than 1 m/s occurred 48% of the time, while wind speeds of more than 5.4 m/s occurred 6.2% of the time, the maximum recorded wind speed was 8 m/s. During the day the wind was predominantly from the west north-west. During the night, winds were mostly from the north. Generally, the wind direction is similar across all the seasons, with higher wind speeds and less calms recorded during the spring months.

- **Soil**

The soil within Modderfontein can be described as follows; Hutton Moderately deep (600-1200mm), red, structureless to weakly structured sandy clay loam soils on hard to weathering rock. Glenrosa Shallow (300-600mm), grey-brown, structure less, gravelly loam sand to sandy loam soils on weathered rock or ferricrete (hard plinthite). Avaloni Glenrosa Mispah Shallow (300-600), yellow-brown, structureless, sandy loam to sandy cay loam soils on mottled soft plinthite or weathered rock. Longlands Wasbabk, Avalon shallow (300-600), bleached grey,

structureless; loamy sand to sandy loam soils on mottled soft plinthite or ferricrete (hard phlinthite). The soils within the proposed site have been extensively mined thus altering the soil structure and profile.

ii. Biological Environment

- **Vegetation**

Modderfontein is located within the grassland biome of South Africa, which is highly threatened with only two percent formally conserved (Le Roux, 2000). The type of regional vegetation unit, which the site falls into, is known as Rocky Highveld Grassland, as described by Low and Rebelo (1996). This is a transitional vegetation unit between typical grasslands of the high inland plateau and the bushveld of the lower inland plateau. It is therefore an ecotonal vegetation type that is quite heterogeneous, consisting of slightly different associations across its length. Frosts during winter play the most important role in the distribution of woody elements in this vegetation type although it is considered to be fire-maintained grassland, which will develop into savannah if fire is excluded.

- **Red data species**

According to GDACE eleven IUCN Red Data plant species could potentially occur in the area based on previous records. Based on the characteristics of the eleven species, it was summarised that the majority of them would either be found in wetlands or on outcrops associated with steep slopes. Of the eleven species that could occur at the site, three had the highest probability of occurring – *Delosperma purpereum, Holothrix micrantha* and *Habenaria bicolour*. None of the three species were found during fieldwork although, another red data species, Calamagrostis epigeios var. capensis, which is near threatened, was found in the game enclosure area near the Dam 4. This was an unusual discovery, as it was found to occur in an area not thought to be ideal habitat and it is likely that it occurs more commonly near to the drainage line down the slope from the plot at which it was found. Two protected species that were also recorded *Cussonia paniculata* and *Scadoxus puniceus*. All species within the genera Cussonia and Scadoxus are protected. However, within the study area there was no Red Data species that were recorded at the proposed site due to disturbed state of the environment.

- **Vegetation communities**

Four vegetation communities, which are representative of areas with natural vegetation and transformed areas, were identified in Modderfontein. These are woodlands; grasslands; pastures; and exotics. The only natural vegetation type is the grasslands, the other types representing transformed vegetation. The distribution and composition of these communities is very much a product of past land use and historical practices, which include agricultural, mining and residential activities. Agricultural activities have been largely confined to less steep areas, with deep soils, more sandy textures and minimum surface rock while the natural areas generally occur in parts of the site with steep slopes, shallower soils, higher clay content and more surface rock. Oryx Environmental in 2005 identified that 18 percent of the Modderfontein area represents natural vegetation and the remaining 82 percent has been transformed. At the study area, the woodland community is not represented at all and the natural grassland community is represented by very small areas that have been subject to considerable impact through

the spread of invasive aliens and mining activities. As a result, the two most widespread vegetation types in Modderfontein are the pastures and exotics

- **Species richness and diversity**

Modderfontein area contained an appreciable number of species. For example, Oryx Environmental identified 158 species in 2005. This does not represent all of the species but indicates that in spite of 82 percent of the area being transformed, the remaining natural areas contain a significant number of species. The grassland community contains the highest number of species, while the exotic community has the lowest diversity by several orders of magnitude as can be seen in Table 6.

Table 5: Species diversity of the Plant community identified at Modderfontein

Study area spp. diversity	Diversity of community within Modderfontein			
	Woodlands	Grasslands	Pastures	Exotics
158	78	104	32	17
Percentage representation	49%	66%	20%	11%

- Fauna

Based on the study conducted by Oryx Environmental in 2005, faunal species that has the probability of occurrence includes: Amphibians, large and medium-sized mammals that were identified using tracks, dung and other biological indicators.

The Red data species identified 39 red data species based upon probabilities of occurrence of IUCN red data species within the vegetation type at Modderfontein. These included 32 mammals, two snakes, one frog, two butterflies and two spiders. Three of the species are listed as critically endangered, two as endangered, five as vulnerable, 16 as near threatened and 13 as data deficient.

Only species with a probability of occurrence of more than 50 percent (medium-high and high) were used in the study's analysis. This included 7 of the 39 red data species listed for the area. The probability of occurrence is based on the known distributional range of a species, and the presence of suitable habitat and food in the study area.

iii. Description of Surrounding Land Use (Within 5 km radius)

The land use surrounding the Modderfontein comprises mainly industrial, commercial and residential land some of which is currently vacant land which is owned by AECI. Industrial areas include Chloorkop, Sebenza, Spartan and Croyden. Commercial areas include Founders View, Longmeadow Business Estate and Greenstone. Residential areas include Thornhill Estate, Thornhill Manor, Lakeside, Linbro Park, Greenstone Hill, Esther Park, Edleen,

Terenure (and Kempton Park West), Birch Acres, Chloorkop, Klipfontein View and other parts of Edenvale, Tembisa and Kempton Park.

iv. SOCIO-ECONOMIC CHARACTERISTICS

Because Modderfontein is under jurisdiction of Ekurhuleni Metropolitan Municipality, the follow subsection entails the socio-economic status at a municipality level

Demographics

Ekurhuleni houses 6% of the country's population and 26% of Gauteng's population. It has a resident population of approximately 3 178 470 million people and 1 015 645 million households. The municipality has an average annual population growth rate of 2.47%. Between 2001 and 2011, the number of households in Ekurhuleni increased by 36.1%, a figure which was above the average national growth of 35.7%. Figure 9 shows the composition and size of the different population groups in Ekurhuleni. The municipality is home to 79% Africans, 16% Whites, 3% Coloureds and 2% Indians.

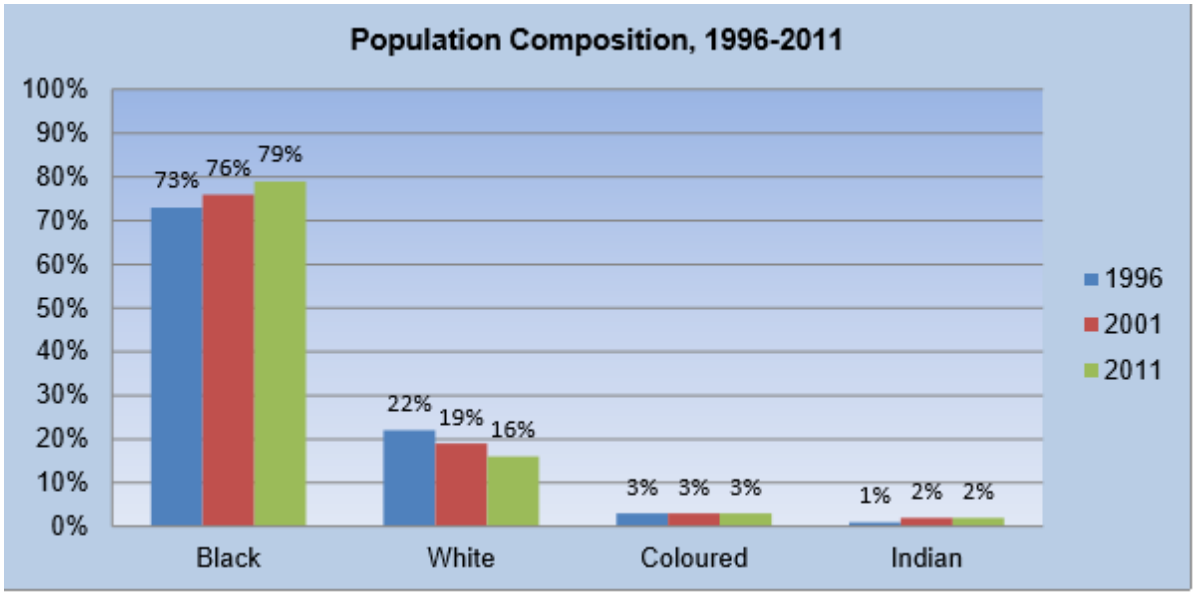


Figure 7: Ekurhuleni Municipality Population Composition (Source: Census 2011, Municipal report

As can be observed in figure 8 below, the pyramid shows an almost even distribution of genders with males at 51% and females slightly trailing behind at 49%. The predominance by males is probably as a result of migration where a typical migrant worker is, more often than not, a male. A large section of the population falls within the 15 to 39 years age group. With such a large population of young people, the metro is necessarily forced to implement programmes aimed at addressing the needs of this group. Consequently, Ekurhuleni has prioritized increased capacitation of youth and adults across the development continuum among its programmes. Among these is the appointment of young people in various roles and their training through the youth development programme.

Figure 8 also shows that EMM has a sizeable section of the population falling in the 0 to 4 years age group which calls for more early childhood development facilities. The implementation of programmes such as the increased participation of children aged 3 to 6 years in accredited early childhood programmes reflects EMM's keen awareness of this reality. Implementation of this programme also includes the construction of early childhood development centres in formerly disadvantaged communities such as Tsakane and Vosloorus to improve access. In addition, the quality of early childhood development services is also being improved through the training of practitioners in this field in both accredited and non-accredited courses. Between 2011 and 2014, a total of 5 332 early childhood practitioners have been trained on various courses in Ekurhuleni.

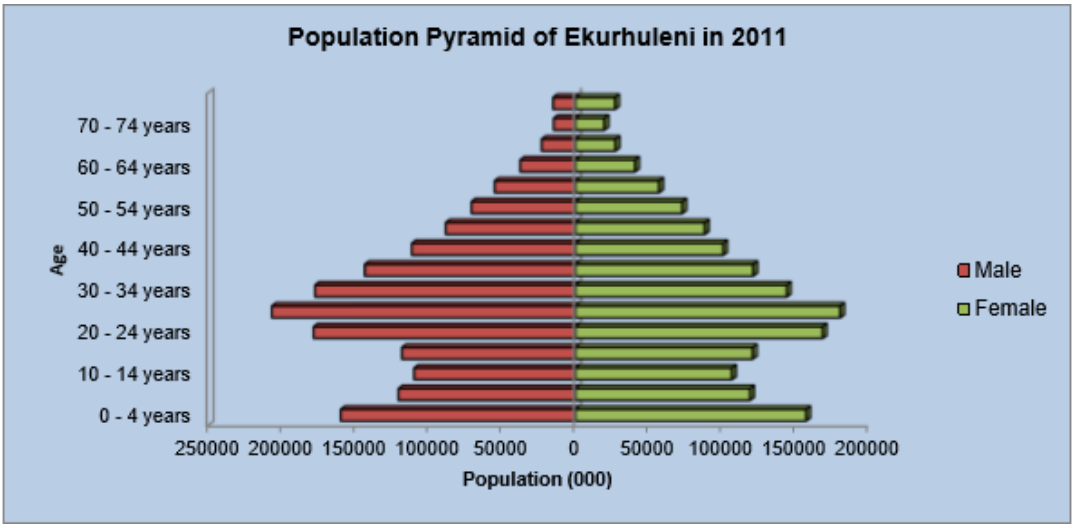


Figure 8: Ekurhuleni gender distribution (source: Census 2011, Super Cross)

Figure 9 below shows that Ekurhuleni has improved its education levels, there are more people committed to completing their matric which is a basis for attaining higher qualification. Also, worth noting is the figure of those not schooling, which has decreased drastically by 6.3%. Town centres such as Kempton Park and Boksburg boast a high concentration of residents with tertiary education while townships such as Tembisa have experienced a strong middle-income growth through the attainment of high levels of education by residents. More than 47% of Tembisa's population has a matric or higher education degree. This translates to more than 27 000 persons.

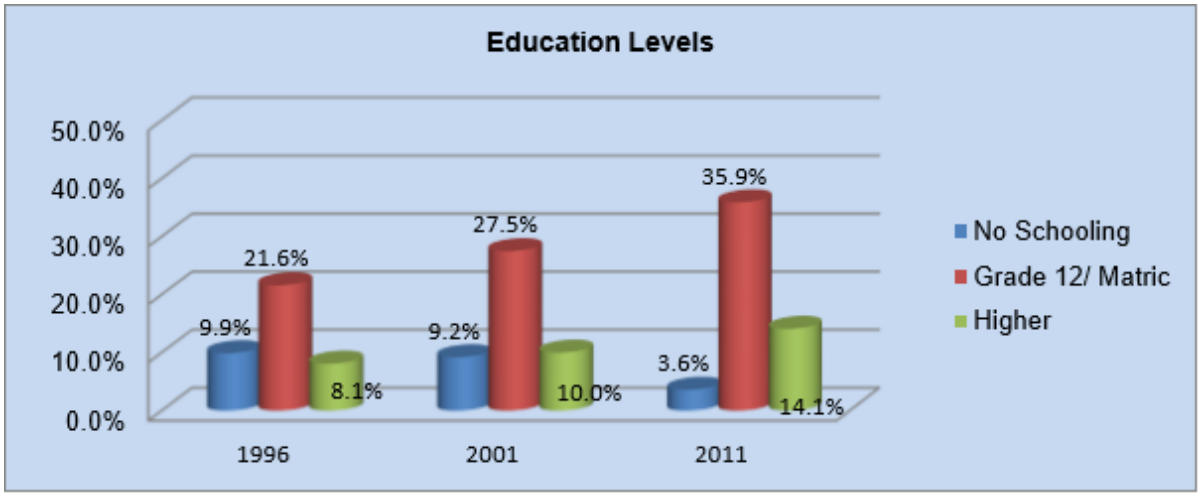


Figure 9: Ekurhuleni education levels (Source: Census 2011, Municipal Report)

An improved education profile is a positive development as it implies that the metro has a literate workforce that is readily available to drive its economy. Be that as it may, the municipality still faces a major challenge when it comes to the full utilization of its available human capital especially the deployment of individuals with much-needed skills to drive its economy. Consequently, EMM has prioritised the acquisition of relevant skills by individuals through partnerships with institutions of higher learning such as the Vaal University of Technology (VUT). The municipality also has a Bursary Scheme for qualifying individuals in different priority fields to ensure there is constant supply of the needed critical skills in Ekurhuleni.

ECONOMIC DEVELOPMENT

EMM's economy has evolved since its heydays as an economy founded on mining. "Ekurhuleni has the largest concentration of industrial activity in South Africa and Sub-Saharan Africa". It is now a commercial and manufacturing hub of South Africa. The economy of Ekurhuleni contributes about 6% to the country's Gross Domestic Product. Ekurhuleni contributes approximately 18% to the total economic output of Gauteng province. Over the period 1997 to 2012, Ekurhuleni's economy grew by an estimated average of 3.1% per annum. Over the period 2005 to 2013 the economy of Ekurhuleni registered steady growth following a slump from 2009. From the graph below it is evident that the growth trend over this period was quite volatile, reaching both lows of –2.3% and highs of 6.1% over the 8-year period. GDP in Ekurhuleni is forecast to reach 2.7% by 2016.

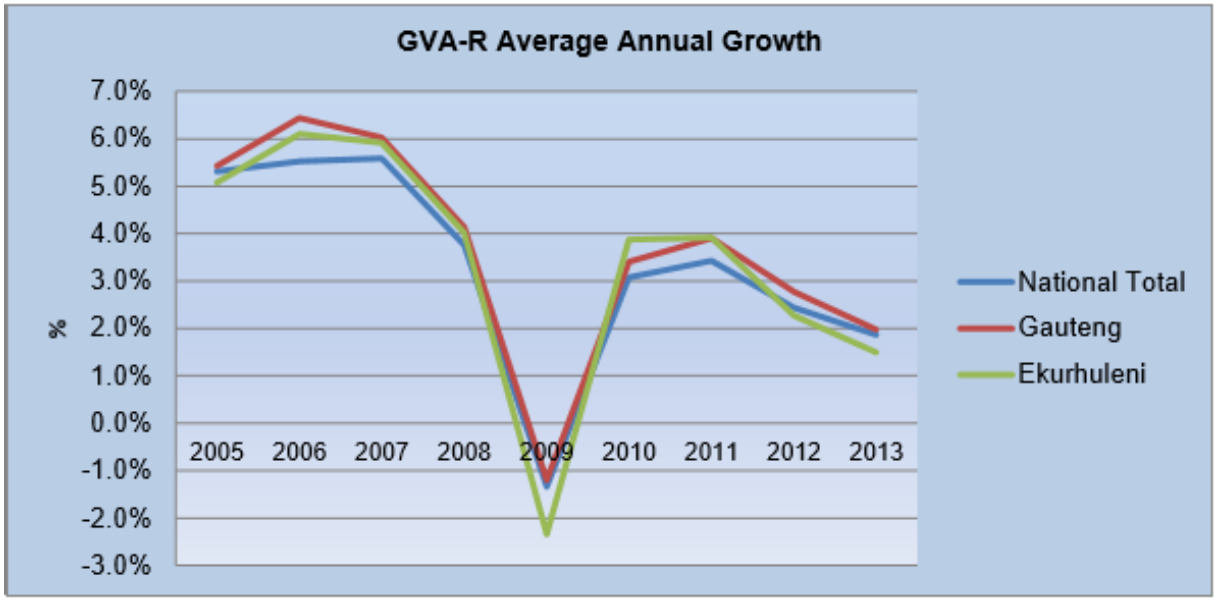


Figure 10:Economic growth trend (Global insight, 2014)

In South Africa, high unemployment (25.4% in quarter three of 2014) coincides with low economic growth (1.4% in quarter three of 2014). Ekurhuleni suffers the same fate. It has the highest unemployment rate in Gauteng compared to other metros. The share of Ekurhuleni's contribution to national unemployment is approximately 9%. According to StatSA, unemployment in Ekurhuleni stands at 28.8%. This is higher than the national rate and can be attributed, among others, to internal migration with individuals being attracted to Ekurhuleni in search of employment opportunities. 72% of Ekurhuleni's population is economically active (i.e. those who are employed or unemployed but looking for work).

In addition to internal migration, another reason for Ekurhuleni's high levels of unemployment emanates from the declining contribution of the manufacturing sector to its economy. Ekurhuleni's manufacturing sector declined by 9.3% between 2004 and 2014. A closer look into manufacturing actually shows that it is the sub-sectors of the fuel, petroleum, chemical and rubber products that suffered major declines during this period. So did the metal products, machinery and household appliances sub-sectors. Be that as it may, manufacturing remains an important sector to Ekurhuleni's economy especially its metal products, machinery and household appliances subsector which has been the main driver behind its output.

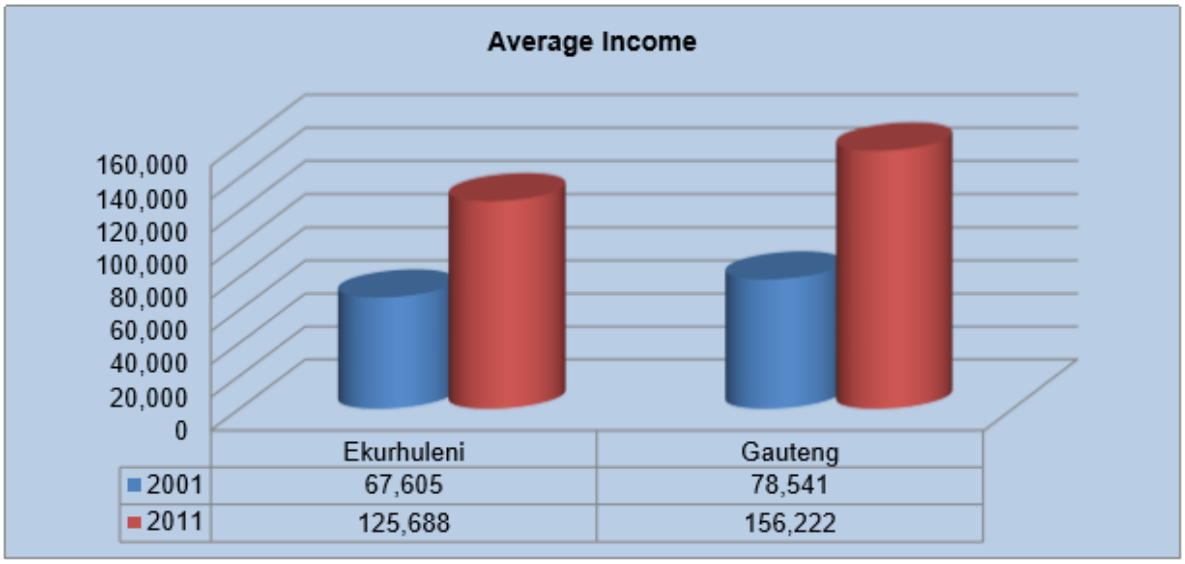


Figure 11: Ekurhuleni income levels in line with provincial trends (Census 2011, Municipal Report)

With the high levels of unemployment, the dependency ratio has increased slightly from the figure of 39.1% in 2001 to 39.4% in 2011. Among all metros in Gauteng, in 2013 "Ekurhuleni had the highest number of Africans living in poverty, at 39, 9 percent". Consequently, 38% of households in Ekurhuleni receive a social grant or are listed on the municipal indigent register. This indicates government's effort at reversing this situation. Between 2001 and 2011, income levels in Ekurhuleni had, in line with provincial trends, improved as reflected in figure 13 above. According to GCRO's Quality of Life Survey (2013), 44% of Ekurhuleni's households earn under R1 600. To assist those in need, EMM has gone on a door to door indigent registration drive since 2013.

Be that as it may, the high unemployment in the country is likely to persist for the foreseeable future as domestic growth forecasts continue to be revised downward. This unemployment, coupled with a relatively low skilled population, is a serious threat to the city's sustainable growth and development. It makes it incumbent on Ekurhuleni to find innovative solutions and strategies aimed at combating unemployment.

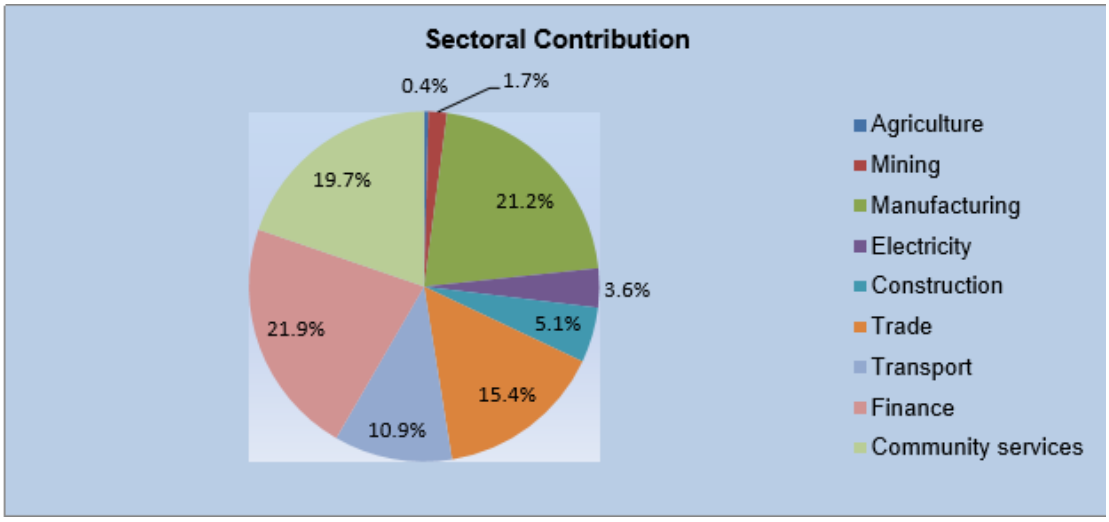


Figure 12: Drivers of Ekurhuleni economy (Source; Global insight)

Figure 12 shows that the economy of Ekurhuleni is driven primarily by five economic sectors and these are: finance and business services, community services, manufacturing, trade and transport. These five economic sectors collectively account for 89% of economic activity within the city. These sectors also account for the highest levels of formal and informal employment. Within the finance and business services sector, it is the finance and insurance and other business activities sub-sectors that contribute most to the sector. Within the trade sector, the wholesale and commission trade sub-sector has been the driving force.

Further analysis of sectors reveals that in terms of recent employment opportunities within EMM's economy, the mining and quarrying sub-sector has potential for job creation. So does the retail trade and repairs sub-sector. The sales, repairs of motor vehicles and sale of fuel sub-sector has also experienced growth in terms of employment levels created therein. Ekurhuleni has also recently experienced increased employment in skilled employment rather than in non-skilled employment. This spells good prospects for individuals since skilled employment holds the promise of a stable source of income. In relation to trade, Ekurhuleni was the highest exporter of machinery and electrical equipment in Gauteng in 2013. It however also imported more vehicles, aircrafts and transport equipment. Nonetheless its ability to export machinery and electrical equipment should be exploited given its strategically located nature closer to the Maputo Corridor.

As a manufacturing hub and with the opportunities presented by the location of OR Tambo International Airport within its borders, supporting the export industry represents a viable strategy for Ekurhuleni. In pursuit of this, the metro has prioritised both the revitalisation of the manufacturing sector and the creation of an Aerotropolis (a city that maximises economic benefits arising from the location of an airport within its boundaries). Among projects being carried out as part of the revitalization of the manufacturing sector are EMM's facilitation of the Tambo-Springs Inland Port and the Prasa-Gibela manufacturing of new rail stock.

EMM also has a programme to revitalize township economies. The economic transformation of Ekurhuleni townships since 2000 has been rated and an institutional framework has been proposed to advance the township

economic agenda with local businesses. Supplier SMMEs in townships are also given support through the Township Enterprise Development Programme. In addition, EMM is adapting old council-owned structures into street trading facilities and is also providing previously disadvantaged communities with access to state-of-the-art manufacturing facilities through Fabrication Laboratories (FabLabs). Thus, the economic viability of townships is high on the agenda of the metros.

Table 6: Town GVAs and Township Economies (Source: Quatec 2014)

Town Centres' GVA Contributions		Size of Township Economies	
Town	2013 GVA Contribution	Township	Economy size
Alberton	9%	Daveyton	2.6%
Benoni	7%	Duduza	1.2%
Boksburg	11%	Dukathole	0.7%
Brakpan	3%	Etwatwa	2.2%
Edenvale	3%	KwaThema	2.0%
Germiston	9%	Katlehong	7.4%
Kempton Park	12%	Tembisa	8.5%
Nigel	1%	Thokoza	1.8%
Springs	5%	Vosloorus	3.9%

- **Cultural feature**

Cultural feature is an important aspect that defines people in a geographic area. During the site inspection undertaken, it was noticed that within the project footprint and its surroundings there are no heritage resources sites, archaeological or place of historical significance that may be impacted by the proposed mining activities. This may be due to that the proposed footprint has been previously mine.

9. Description of the current land uses.

The proposed area zoned as industrial development. The area was previously mined and is adjacent to old gold dumps. There are no other activities on the proposed site except for illegal mining. The project area is situated approximately 5km outside Benoni Town and 30km East of Johannesburg

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

There are temporary offices on site and ablution facilities that were used during the reclamation of Mine dumps on the same property which was the initial project that was licensed on the property.

9.2. Environmental and current land use map.

(Show all environmental and current land use features)

APPENDIX 5

10. Impacts identified

(Provide a list of the potential impacts identified of the activities described in the initial site layout that will be undertaken, as informed by both the typical known impacts of such activities, and as informed by the consultations with affected parties together with the significance, probability and duration of the impacts phase)

This project will have impacts on the environment through the following activities

Table 7: Identified Impacts

Activity	Phase	Potential impacts (unmitigated)
Clearance of vegetation	• Construction and Operational phase	• Loss of vegetation • Visual impacts • Soil erosion • Habitat loss • Dust emissions
Earth works	• Construction phase	• Dust emissions • Loss of vegetation • Slope instability • Visual impacts • Soil erosion • Noise generation • Soil structure damage • Automobile emission • Soil compaction • Respiratory constrains
Stockpiling of construction materials	• Construction phase	• Visual impacts • Transportation of alien invasive species • Respiratory constrains

Construction of offices	• Construction phase	• Soil contamination • Ground water contamination
Transportation of raw material to site (for all infrastructure)	• Construction • Operational	• Dust emissions • Traffic congestion • Pollution of surface water resources • Visual impacts
Storage of raw materials	• Operational	• Soil erosion • Visual nuisance • Loss of mineral reserves
Waste rock management Storage, final disposal	• Operation • Decommissioning • Closure (final land form)	• Disturbance of biodiversity • Pollution of surface water resources • Contamination of groundwater • Air pollution • Acid mine drainage • Negative landscape and visual impact
Dirty water management Collection, storage of dirty water for re-use, recycling	• Construction • Operational • Decommissioning	• Pollution of surface water resources • Contamination of groundwater • Soil contamination • Odour
Storm water management Storm water channels and berms, collection of dirty water	• Operational • Decommissioning	• Alteration of drainage patterns • Pollution of surface water resources • Contamination of groundwater
Non-mineralized waste management Transportation of waste materials to waste facility	• Operation • Decommissioning • Closure (limited)	• Air pollution • Water pollution • Land contamination

Site / contract management Appointment of workers/contractors, site management (monitoring, inspections, maintenance, security, access control),	• Construction • Operation • Decommissioning • Closure	• Management of the site plays a significant role in all identified impacts • High probability of theft if not controlling the site access
Storage and maintenance services/ facilities Washing vehicles and machinery, storage and handling non-process Materials	• Operation • Decommissioning	• Pollution of surface water resources • Contamination of groundwater • Disturbing noise • Soil contamination
Site support services Operating offices, parking vehicles	• Construction • Operation • Decommissioning	• Air pollution • Visual impacts
Demolition Dismantling, demolition, removal of equipment	• Operation (as part of maintenance) • Decommissioning	• Hazardous structures/excavations • Loss of soil resources and land capability • Disturbance of biodiversity • Air pollution • Disturbing noise • Visual impacts • Health constraints
Rehabilitation Replacing soil, slope stabilization, landscaping, re-vegetation, restoration	• Construction • Operation • Decommissioning • Closure	• Hazardous excavations • Loss of soil resources and land capability • Disturbance of biodiversity • Pollution of surface water resources • Alteration of natural drainage patterns • Contamination of groundwater • Air pollution

		• Disturbing noise • Visual impacts
Maintenance and aftercare **Inspection and maintenance of remaining facilities and rehabilitated areas**	• Closure	• Loss of soil resources and land capability • Disturbance of biodiversity • Pollution of surface water resources • Air pollution • Visual impacts

11. Methodology used in determining the significance of environmental impacts

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

The criteria to be used to evaluate the impacts of this activity are as follows: nature, extent, duration, intensity and probability of occurrence.

- **Nature:** A brief written statement of the environmental aspect being impacted upon by a particular action of activity;
- **Extent:** The area over which the impact will be expressed;
- **Duration:** The indicates what the lifetime of the impact will be;
- **Intensity:** Describes whether an impact is destructive or benign; and
- **Probability:** Describes the likelihood of the impact actually occurring.
- **Cumulative:** In relation to an activity, means the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

Table 8:Methodology Used

CRITERIA	DESCRIPTION			
EXTENT	National (4) The whole of South Africa	Regional (3) Provincial and parts of neighbouring provinces	Local (2) Within a radius of 2km of the construction site	Site (1) Within the construction site
DURATION	Permanent (4) Mitigation either by man or by natural process will not occur in such a way or in such a time span that the impact can be transient	Long term (3) The impact 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. The only class impact which will be non-transitory.	Medium-Term (2) The impact will last for the period of the construction phase, thereafter it will be entirely negated	Short-Term (1) The impact will either disappear with mitigation or will be mitigated through natural process on a span shorter than the construction phase

INTENSITY	Very High (4)	High (3)	Moderate (2)	Low (1)
	Natural, cultural and social functions and processes are altered to extent that they permanently cease	Natural, cultural and social functions and processes are altered to extent that they temporarily cease	Affected environment is altered, but natural cultural functions and social functions and processes continue.	Impact affects the environment in such a way that, natural cultural and social functions and processes albeit in a modified way
PROBABILITY OF OCCURANCE	Definite (4) Impact will certainly occur	Highly Probable (3) Most likely that the impact will occur	Possible (2) The impact may occur	Improbable (1) Likelihood the of materializing is very low

Significance=Extent+ Duration +Intensity x Probability

Table 9: Significance Ratings

Low Impact(3-10points)	A low impact has no permanent impact of significance. Mitigation measures are feasible and are readily instituted as part of a standing design,construction or operating procedure.
Medium Impact (11-20 points)	Mitigation is possible with additional design and construction inputs.
High Impact (21-30points)	The design of the site may be affected. Mitigation with possible remediation is needed during the construction and/or operational phases. The effects of the impact may affect the broader environment.
Very High Impact (31-48 points)	Permanent and important impacts. The design of the site may be affected. Intensive remediation is needed during construction and/or operational phases. Any activity which results in a "very high impact" is likely to be a fatal Flaw
Status	Denotes the perceived effect of the impact on the affected area
Positive (+)	Beneficial impact.
Negative (-)	Deleterious or adverse impact.
Neutral (/)	Impact is neither beneficial nor adverse.

11.1. Impacts and risks identified including the nature, significance, consequences, extent, duration, and probability of potential environmental impacts and risks

All the anticipated impacts and risks, as well as significance for the proposed project during the life of the project have been included in Table 11 to Table 13 below. Mitigation measures associated with each impact and risk are also included in these tables

11.2. Probability of the impacts, including the degree to which these impacts

(Provide a list of the potential impacts identified of the activities described in the initial site layout that will be undertaken, as informed by both the typical known impacts of such activities, and as informed by the consultations with affected parties together with the significance, probability, and duration of the impacts. Please indicate the extent to which they can be reversed, the extent to which they may cause irreplaceable loss of resources, and can be avoided, managed or mitigated).

All the anticipated impacts and risks, as well as significance for the proposed project during the life of the project have been included in Table 11 to Table 13 below. Mitigation measures associated with each impact and risk are also included in these tables

11.3. Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;

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

The criteria to be used to evaluate the impacts of this activity are nature, extent, duration, intensity and probability of occurrence and this is discussed on table 12 to 14 below

11.3.1. The positive and negative impacts that5 the proposed activity (in terms of 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)

The proposed activity will have positive and negative impacts

Positive Impacts:

- Insurance of long-term jobs for employees; the proposed project intents to employ approximately 60 workers
- The project tends to rehabilitate the area so that it can be used for development
- They will minimise illegal mining in the area
- They will improve surface water management
- They will reduce crime in the area
- Open pit will be rehabilitated by the deposition of the resulting waste

Potential Negative Impacts:

- They will pose a negative impact on the water quality
- Additional traffic associated with movement of machinery and vehicles to and from site, as well as movement on site; and
- Possible noise generation during operation of the plant works

11.4 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).

Table 10: Mitigation Measures

Potential Impact Description	**Significance Rating (Positive or Negative)**	**Proposed Mitigation**	**Significance Rating after Mitigation**
Noise pollution	Low (Negative)	• The noise created by the proposed development is not expected to be problematic. If required, noise reduction measures will have to be implemented in compliance with Noise standards and Regulations. • Activities that will generate the most noise should be limited to during the day, where viable, in order minimise disturbance.	Low
Dust pollution	Low (Negative)	• Vehicles operation on site must be roadworthy to prevent unwanted emissions and leaks as well as keep minimum speed to reduce dust generation. • Air specialist study will provide more information on how to control dust • Dust suppression twice a day	Low
Risk of Cyanide pollution transported to residential homes	Low (Negative)	• Cyanide reduced to safe levels by minimizing the amount of cyanide used	Low

Already low Water pressure in the area will be further disturbed	Low (Negative)	• Water saving strategies should be practiced such as re-use	Low
How will waste or soil be disposed off by truck?	Low (Positive)	• Waste will be disposed to the sinkhole through sludge pipe	Low
Leaking and spillage	Low (Negative)	• Appropriate storage of hazardous material such as diesel must be implemented. • The areas where hazardous substances are stored should be bunded to avoid soil and water contamination. • Fuel must be stored in a secure designated room. • The ground where refueling takes place must be protected and refueling to be handled in a .	Low
Traffic entrance Impact	Moderate (Negative)	• Limit vehicles coming to the site and limit to a temporary minimal duration. • Maintain and/or upgrade the gravel road. • Effective signage and traffic control measures along the road	Low
Impact on Land	Moderate (Positive)	• Topsoil replacement should be done systematically; slopes should be kept low to prevent run-off and erosion, and replaced according to the soil types. • The topsoil stockpiles should be vegetated as soon as possible to prevent erosion, which might cause siltation of the water resources. • Avoid compaction of topsoil.	

Soil and water resources contamination	Moderate (Negative)	• Prevent any spills from occurring; If a spill occurs it is to be cleaned up immediately and Reported to the appropriate authorities. • All vehicles are to be serviced in a correctly bunded area or at an off-site location. • Ensure that spillage control kits are available during transport and on storage sites in case of any accidental leakages of spillages, which can then be cleared immediately. • The temporary storage facilities of fuel and lubricants roofed and bunded facility. This will prevent contamination of soils and the possibility of contamination of the surface water	
		resources. • Machinery should be maintained properly. Diesel and other chemicals should be handled appropriately. Refueling protocols must be followed to ensure no diesel is spilled during filling. • Clean and dirty surface water channels should be constructed to divert runoff separately to appropriate storage dams (dirty water to the PCD to avoid eroded soils accessing clean water areas).	
Impact on Groundwater	Moderate(Negative)	• Implement measures to collect and store clean water that falls within the Project area for use on site. e.g. watering of gardens, wash bays and dust suppression. Although the hard surfaces on site will increase runoff there by reducing recharge of the aquifer, the collection of this water for use on site will reduce the need to pump water from boreholes. • Monitor changes in water levels and quality around the Project area, so as to be aware of changes in groundwater conditions.	

11.5. Motivation where no alternative sites were considered

No alternative site was considered. This is because the proposed project intends to reclaim and process gold dumps that are already in place on the proposed site thus this project is dependent on the existing gold dumps

12 Statement motivating the alternative development location within the overall site.

(Provide a statement motivating the final site layout that is proposed)

The proposed site is an old gold mining area constituted by several gold dumps that can be processed at a profit. Furthermore, removing these gold dumps will promote employment and development of the area, and to a certain extent counter pollution and crime. No other alternative location was considered for the proposed activity since the gold dumps to be processed are the closest to the proposed location of the processing plant. Above all, this area will be properly rehabilitated for future developments.

12.1. 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.(Including (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.)

Table 11: Assessment of Potential Impacts during Planning Phase

During Planning Phase													
ACTIVITY whether listed or not listed.	**POTENTIAL IMPACT**	**ASPECTS AFFECTED**	**Rating before Mitigation**				**SIGNIFICANCE** if not mitigated	**MITIGATION TYPE**					**SIGNIFICANCE** if mitigated
			E	**I**	**D**	**P**			**E**	**I**	**D**	**P**	
Environmental compliance	Commencement without necessary authorisation s	Project Delays	3	4	2	3	27	• Complying with legislations and regulations	1	1	2	1	4
Increased traffic	Traffic Congestion		2	2	2	3	18	• Use of existing roads • Control though minimal of vehicle movement	1	1	1	1	3

Table 12: Assessment of Potential Impacts during Construction

During Construction Phase

ACTIVITY whether listed or not listed.	**POTENTIAL IMPACT**	**ASPECTS AFFECTED**	**Rating before mitigation**				**SIGNIFICANCE** if not mitigated	**MITIGATION TYPE**					**SIGNIFICANCE** if mitigated
			E	**I**	**D**	**P**			**E**	**I**	**D**	**P**	
Stockpiling of Construction Material	• Visual impacts • Transportation of alien invasive species • Respiratory constrains	Land	1	1	1	1	3	• All workers to be proved with personal Protective clothing • unconsolidated overburden material is stripped between the subsoil and the bedrock, this should be stockpiled separately to the classifiable soil material; • The location of the topsoil stockpile should be selected strategically such that minimal re-handling is required during rehabilitation; • Stockpiled topsoil should be revegetated to minimise loss of soils resource due to wind and water erosion. • Compact and shape	1	1	1	1	3

								overburden stockpile to be free draining to minimise rainfall infiltration.					

Construction of offices and Processing Plant	• Soil contamination • Ground water contamination • Reduced underground water quality	Reduced surface water flow and water scarcity	**1**	**3**	**3**	**3**	**21**	• Fuel spillages must be attended to as soon as spillage occur and the area must be contained • All fuels must be stored on bunded area on site • Fence processing plant area and offices prior to commencement of construction to limit impact on adjacent vegetation areas. • Avoidance of sensitive areas during the site selection process. • Vehicles should always be in acceptable speed on site • Erosion protection measures will be implemented at steep areas. • Surface water management measures, such as stormwater canal is to be	**1**	**1**	**1**	**1**	**3**

								constructed first to ensure that runoff and dirty water spills are contained.					

								dirty water spills are contained.					

Transportation of Raw materials to site	• Dust emissions • Traffic congestion • Pollution of surface water resources • Visual impacts	Visual Impacts	**1**	**1**	**1**	**1**	**3**	• Transport all raw materials during the day when the peak of traffic is very low	**1**	**1**	**1**	**1**	**3**

Waste Management	• Pollution of surface water resources • Contamination of groundwater • Soil contamination • Increased dumping of solid Wastes	Spread of Pathogens Loss of Aquatic Life	**2**	**3**	**3**	**4**	**32**	• Project Manager will ensure that good waste management practices are implemented effectively • Municipality should collect wastes for disposal at registered Landfill Site.	**1**	**2**	**4**	**1**	**7**

supply of construction materials	• Diminishing tar road quality • Formation of Potholes and possible accidents	Slow traffic movement	1	1	1	1	3	• Deliveries of construction materials should be done during the day when the peak of traffic is very low	1	1	1	1	3

Site Clearing	• Destruction of Cultural Resources	Community disapproval of the project	**2**	**3**	**2**	**2**	**14**	• Cultural resources must be identified prior to development	**1**	**1**	**1**	**1**	**3**

Scrapping of the topsoil	• Generation of Dust • Soil Erosion	Soil Excavations	**1**	**3**	**2**	**4**	**24**	• The working surface must be regularly watered	**1**	**1**	**1**	**2**	**6**

Table 13:Assessment of Potential Impacts during Operational

During Operational Phase													
ACTIVITY whether listed or not listed.	**POTENTIAL IMPACT**	**ASPECTS AFFECTED**	**Rating before mitigation**				**SIGNIFICANCE** if not mitigated	**MITIGATION TYPE**	**SIGNIFICANE** if mitigated				**SIGNIFICANCE** if mitigated
			E	**I**	**D**	**P**			**E**	**I**	**D**	**P**	
Flow of storm water from site into surface water systems	Water Contamination	Surface Water	2	2	3	2	14	• The site must be free of littering as this will be carried to the adjacent stream	1	2	2	1	5
Contaminated surface water infiltration into the subsurface	Water Contamination and Reduced ground water availability	Ground water	2	2	2	2	12	• Chemical and Fuel spills must be attended to as soon as they occur and the area be contained and remediated	1	1	1	1	3
Poor designs of storm water management system	Alteration of hydrology Due to excessive storm	Storm water Management	2	3	2	3	21	• Storm water management systems need to be put in place before the operation of the project • Vehicle movement	2	1	1	2	8

	water input							• Control through monitoring of dust fall to determine if measures are effective					
Increased maintenance requirement	Shortage of water	Water supply	**2**	**3**	**4**	**3**	**27**	• Use of Personal Protective clothing • Use of water to prevent dust emission • Service the processing plant regularly	**2**	**1**	**1**	**2**	**8**
Mixing of cyanide	Risk of Cyanide pollution transported to residential homes	Health issues	**2**	**3**	**3**	**3**	**24**	• Cyanide reduced to safe levels by minimizing the amount of cyanide used	**2**	**2**	**2**	**2**	**12**
Operation of processing plant	Increased noise level	Noise	**2**	**1**	**3**	**4**	**24**	• Regular maintenance of the processing plant.	**1**	**1**	**1**	**1**	**3**
Dumping of recyclables	• Increased volume of wastes • Contamination of water & Soil	Waste Collection	**1**	**3**	**3**	**3**	**21**	• Wastes must be separated and dumped on separate marked waste bins	**1**	**1**	**1**	**1**	**3**

12.2. Assessment of each identified potentially significant impact and risk

(This section of the report must consider all the known typical impacts of each of the activities (including those that could or should have been identified by knowledgeable persons) and not only those that were raised by registered interested and affected parties).

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,	**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)	**SIGNIFICANCE** if not mitigated	**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. Modify through alternative method. Control through noise control through management and monitoring through rehabilitation.	**SIGNIFICANCE** if mitigated

etc.…etc.…etc.).						
Clearance of vegetation	• Visual Impacts • Soil Erosion • Habitat Loss • Dust Emission • Loss of Vegetation	Vegetation	• Construction and Operational	Low	• Clearance of an area to be used. • Use existing roads on site • Clearing of vegetation during the day	Low

Earth works	• Dust Emission • Loss of Vegetation • Slope instability • Visual impacts • Noise generation • Soil structure damage • Automobile emission • Soil compaction • Respiratory constrains	Land	• Construction phase	High Impacts	• Use of existing roads	Low impacts
Stockpiling of construction material	• Visual impacts • Transportation of alien invasive species • Respiratory constrains	Land	• Construction phase	Low Impacts	• All workers to be proved wit personal Protective clothing • Stockpiling should at minimum height.	Low impacts

Construction of offices	• Soil contamination • Ground water contamination	Ground Water	• Construction Phase	High Impacts	• Build a bunded floor to prevent oil seepage	Low impacts
Transportation of Raw materials to site	• Dust emissions • Traffic congestion • Pollution of surface water resources • Visual impacts	Visual Impacts	• Construction and operational	High Impacts	• Transport all raw materials during the day	Low impacts
Hauling and Transportation of waste	• Dust Pollution	Air Quality	• Operational	High Impact	• Control though dust suppression • Control though minimal of vehicle movement • Control through monitoring of dust fall to determine if measures are effective	Low Impacts

Storage of Raw Materials	• Air pollution from dust emissions during crushing and screening process • Noise nuisance • Health risk	Air Quality	• Operational	High Impacts	• Use of Personal Protective clothing • Use of water to prevent dust emission • Service processing plant regularly	Low impacts
Waste and Rock Management	• Pollution of surface water resources • Contamination of groundwater • Soil contamination • Odour	Ground Water	• Operation • Decommissioning • Closure (final land form)	High Impacts	• Any waste generated during construction must be stored in such a manner that it prevents pollution and amenity impacts. • Waste to be disposed of at a deposition area owned by Gold Plats through constructed sludge pipe.	Low Impacts

Mixing of cyanide	• Operational	Land and surface water	Operational	High Impacts	• There will be an incident management system including procedures and training for dealing with spillage incidents • Major spillage will be reported to the department and remedial action will be taken. • Contaminated soil at the affected area will be landscaped and rehabilitated	Low Impacts
Dirty water management Collection, storage of dirty water for re-use, recycling	• Pollution of surface water resources • Contamination of groundwater • Soil contamination • Odour	Surface Water	• Construction • Operational • Decommissioning	High Impacts	• Reuse of water. • Inspect pipes regularly • Change water after few cycle	Low Impacts
General Waste management	• Land Pollution	Land	• Operation • Decommissioning • Closure (limited)	Low Impact	• The mine will ensure that good waste management practices are implemented effectively	

Storage and maintenance services/ facilities Washing vehicles and machinery, storage and handling non-process materials	Pollution of surface water resources Contamination of groundwater Disturbing noise Soil contamination	Land	Operation Decommissioning		• Storage will have appropriate runoff system for clean and dirty water and they will be maintained to ensure effectiveness • A maintenance system will be implemented to ensure regular cleaning of surface area • Clean and dirty water must be separated.	
Site support services Operating offices, parking vehicles	• Air pollution • Visual Impacts	Land	Construction Operation Decommissioning	High Impact	• Employees will be trained on general awareness with regards to water, electricity and other resources saving and minimisation of use. • Such training will happen on a regular basis to ensure that there is continuity	Low Impact

Demolition Dismantling, demolition, removal of equipment	• Hazardous structures/excavations • Loss of soil resources and land capability • Disturbance of biodiversity • Air pollution • Disturbing noise • Visual impacts • Health constraints	Air Quality, Ground and Surface Water and land	Operation (as part of maintenance) Decommissioning		• Appropriate measure will be identified in consultation with specialist	

The supporting impact assessment conducted by the EAP must be attached as an appendix, marked **Appendix**

13. Summary of specialist reports.

(This summary must be completed if any specialist reports informed the impact assessment and final site layout process and must be in the following tabular form): -

Table 14: Summary of specialist reports.

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.
Heritage Impact assessment	• The noted structures and the proposed excavations underground have medium significance value by virtue of being over 60 years of age and also about their historical, social, aesthetic and tourism value. These structures are rated by this study as of locally important (Local Grade III B), and are considered as an important heritage situate in the larger history of Benoni. According to Section 34(1) of the National Heritage Resource Act, no person may alter or demolish any structure or part of a structure, which is older than 60 years without a permit, issued by the relevant provincial heritage resources authority, in this case, PHRAG. Section 3 of the same Act also protects the demolition or altering of any structure in the Republic of South Africa for its cultural significance or other special value, such as: ✓ Itsimportanceinthecommunity,orpatternofSouthAfrica'shistory ✓ Its potential to yield information that will contribute to an		

	understanding of South Africa's cultural heritage		

	✓ Its importance in demonstrating the principal characteristics of a particular class of South Africa's cultural places or objects ✓ Its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group ✓ Its importance in demonstrating a high degree of creative or technical achievement at a particular period ✓ Its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons ✓ Its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and ✓ Structures of significance relating to the history of slavery in South Africa. • It is strictly recommended that a Second Phase Heritage Impact Assessment is conducted by a heritage specialist in line with the Gauteng Heritage Resources Authority (PHRAG). This should be done before the commencement of the proposed development, and it will entail proper documentation of the noted structures.. • Despite that no archaeological objects were observed during the survey, and that the area is disturbed due to mining activities, the client is reminded that unavailability of archaeological material does not mean absentee,		

	archaeological material might be hidden underground. It is thus the responsibility of the developer to notify contractors and workers about archaeological material (e.g., pottery, stone tools, remnants of stone-walling, graves, etc) and fossils that may be located underground. Furthermore, the client is reminded to take precautions during construction. • Prior to construction, contractors should be given training on how to identify and protect archaeological remains that may be discovered during the project. The pre-construction training should include some limited site recognition training for the types of archaeological sites that may occur in the construction areas. Below are some of the indicators of archaeological site that may be found during construction: ✓ Flaked stone tools, bone tools and loose pieces of flaked stone; ✓ Ash and charcoal; ✓ Bones and shell fragments; ✓ Artefacts (e.g., beads or hearths); ✓ Packed stones which might be uncounted underground, and might indicate a grave or collapse stone walling. In the event that any of the above are unearthed, all construction within a radius of at least 10m of such indicator should cease and the area be demarcated by a danger tape. Accordingly, a professional archaeologist or PHRAG officer		

	should be contacted immediately. In the meantime, it is the responsibility of the contractor to protect the site from publicity (i.e., media) until a mutual agreement is reached. Noteworthy that any measures to cover up the suspected archaeological material or to collect any resources is illegal and punishable by law. In the same manner, no person may exhume or collect such remains, whether of recent origin or not, without the endorsement by PHRAG.		

Geotechnical study	• No special precautionary measures are needed for the construction of pipe services. The use of concrete and uPVC pipes for underground stormwater, sewerage and water supply is recommended. The use of steel piping for underground services is not recommended unless suitable corrosion protection is applied. Intermediate to hard excavations will be required for deep pipe trenches in most areas of the site. Lateral support (shoring) of pipe trenches deeper than 1.2 meters is nevertheless recommended to ensure safe working conditions. • The in-situ materials present on this site are deemed to be sufficient to be used for internal roads and parking areas. Material for sub-bases and base courses for higher class roads may have to be imported but in-situ material can be used for some applications if carefully • Design of foundations, in accordance with an appropriate Code of Practice, is recommended. Founding solutions for buildings and plant must be designed, specified and supervised by a professional engineer. Additional testing during a Phase II investigation to confirm permissible bearing pressures is deemed essential for large structures and plant. Safe bearing pressures in excess of 250 kPa may be available in the residual mud rock and similar dense material at deeper levels on site. Precautionary measures against differential soil movements, such as movement joints, reinforcement in brickwork and good		

	stormwater management will nevertheless be beneficial and should be specified by the appointed structural engineer. • The site must be properly drained to prevent accumulation of stormwater in one place. The design and detailing of a stormwater system is deemed essential for any type of development on this site.		

14. Environmental Impact Statement

14.1. Summary of the key findings of the environmental impacts' assessment;

- The significance of potential environmental impacts can be reduced to **Medium – Low** with implementation of mitigation measures and monitoring.
- Cumulative noise and visual impacts are rated with a negligible significance.
- Likewise, potential impacts on the socio-economic environment and livelihoods can be mitigated to
- **Medium – Low** significance.
- The proposed mining activities may lower the ground water levels thus reducing the surface water recharge

14.2. 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. Attach as **Appendix 4)***

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. (See Appendix 4)

14.3. Summary of the positive and negative implications and risks of the proposed activity and identified alternatives;

- Increased ambient noise levels resulting from Tipper Tracks, and increased traffic movement during all phases
- Potential water and soil contamination from hydrocarbon spills and soil erosion which may impact on the environmental resources utilized by communities, landowners and other stakeholders.
- Potential water and soil pollution impacts resulting from hydrocarbon spills and soil erosion which may impact on ecosystem functioning.
- 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 opportunities of crime.
- Creation of employment opportunities

14.4. 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.

Impact management objectives are described in terms of the Mitigation Hierarchy of the ERM Impact Assessment Standard. The mitigation hierarchy is as follows:

- **Avoid at Source:** Reduce at Source: avoiding or reducing at source through the design of the Project (e.g., avoiding by siting or re-routing activity away from sensitive areas or reducing by restricting the working area or changing the time of the activity).
- **Abate on Site:** add something to the design to abate the impact (e.g., pollution control equipment, traffic controls, perimeter screening and landscaping).
- **Abate at Receptor:** if an impact cannot be abated on-site then control measures can be implemented off-site (e.g., noise barriers to reduce noise impact at a nearby residence or fencing to prevent animals straying onto the site).
- **Repair or Remedy:** some impacts involve unavoidable damage to a resource (e.g. agricultural land and forestry due to creating access, work camps or materials storage areas) and these impacts can be addressed through repair, restoration or reinstatement measures.
- **Compensate in Kind; Compensate Through Other Means:** where other mitigation approaches are not possible or fully effective, then compensation for loss, damage and disturbance might be appropriate (e.g., planting to replace damaged vegetation, financial compensation for damaged crops or providing community facilities for loss of fisheries access, recreation and amenity space).

Impact management objectives:

- Provide sufficient information to strategically plan the mining activities as to avoid unnecessary social and environmental impacts
- Provide sufficient information and guidance to plan the mining activities in a manner that would reduce impacts (both social and Environmental) as far as practicable.
- Ensure an approach that will provide the necessary confidence in terms of environmental compliance.
- Provide a management plan that is effective and practical for implementation

Impact Management Outcome:

Through the implementation of the proposed mitigation measures, it is anticipated that the identified social and environmental impacts can be managed and mitigated effectively. Through the implementation of the mitigation and management measures, it is expected that:

- Noise impacts can be managed through consultation
- The pollution of soil and water resources can be effectively managed through containment;
- Ecological impact can be managed through the implementation of pollution prevention measures, minimising land clearing, restricting working hours (faunal disturbances) and rehabilitation.
- Concerns regarding access control to the site can be managed through the development and ensuring compliance to an appropriate access control procedure.
- Risks associated with crime can be mitigated through avoiding recruitment activities on site as well as monitoring and reporting.
- Visual impacts can be minimized through giving consideration to infrastructure placement and materials used

14.5. 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)*

There is no alternative site considered for the proposed Underground mining and waste Management License because the minerals that have been discovered are fixed or are located within the preferred site.

14.6. 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

- An Environmental Control Officer must be appointed at the commencement of the proposed activity in order to conduct a monthly Environmental Audit and compliance monitoring in terms of regulation 34 of the NEMA EIA 2014 Regulations
- All general waste generated must be disposed of at an appropriate registered landfill and disposal certificate be should be kept on site.

14.7. Description of any assumptions, uncertainties and gaps in knowledge.

(Which relate to the assessment and mitigation measures proposed)

- The EAP does not accept any responsibility in an event that additional information comes to light at a later stage of the process
- All information provided by the EAP was correct at the time it was provided

- The data from unpublished researches is valid and accurate
- The scope of this investigation is limited to accessing the potential environmental impacts associated with the proposed project.

14.8. Reasoned opinion as to whether the proposed activity should or should not be authorised

14.8.1. Reasons why the activity should be authorized or not.

- South Africa have limited land for residential development and this project will rehabilitate the slime dams and deep excavation to a point where such land can be used for residential purposes once the mineral is depleted and the project is closed.
- One of the main objectives of this project is to boost the local economy by providing employment for approximately 60 local residents.

14.8.2. Conditions that must be included in the authorisation

14.8.2.1. Specific conditions to be included into the compilation and approval of EMPr

- Potential impacts identified should be monitored during all phases of the project. Monitoring will form an important aspect of the mine's operations. Management measures will be amended to address the impacts if analysis of monitoring trends indicates this may be necessary. Monitoring of the operations, in accordance with their operating plans and protocols, will also form an important activity to ensure their long-term sustainability.
- A water use licence application should be applied for and granted, prior to the commencement of the proposed project.
- Ensure that all hazardous storage containers and storage areas comply with the relevant SABS standards to prevent leakage. Regularly inspect all vehicles for leaks
- Implementing an Environmental Emergency preparedness procedure and the non-conformance and compiling the corrective action procedure for the project.
- To ensure that all staff, contractors and sub-contractors are aware of and understand the requirements of the EMP and environmental issues in relation to their individual areas of work

14.8.2.2. Rehabilitation requirements

- Providing the vision, objectives, targets and criteria for final rehabilitation, decommissioning and closure of the project;
- Outlining the design principles for closure;
- Explaining the risk assessment approach and outcomes and link closure activities to risk rehabilitation;
- Detailing the closure actions that clearly indicate the measures that will be taken to mitigate and/or manage identified risks and describes the nature of residual risks that will need to be monitored and managed post closure;
- Committing to a schedule, budget, roles and responsibilities for final rehabilitation, decommissioning and closure of each relevant activity or item of infrastructure;

- Outlining, monitoring, auditing and reporting requirements

14.9. Period for which the Environmental Authorisation is required.

The environmental authorisation (EA) and Waste Management Licence is required for 30 years. Subsequent amendments can be lodged as the operational structures change accordingly.

14.10. 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 EAP herewith confirms

- the correctness of the information provided in the reports
- the inclusion of comments and inputs from stakeholders and I&APs ;
- the inclusion of inputs and recommendations from the specialist reports where relevant; and
- that the information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected. Parties are correctly reflected herein.

15. Financial Provision

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

15.1. Explain how the aforesaid amount was derived.

The liability for closure of the aspects associated with the proposed Project has been determined using the approach advocated in the Department Mineral Resources (DMR) Guideline Document for the Evaluation of the Quantum of Closure-Related Financial Provisions Provided by a Mine (2005).

15.2. Confirm that this amount can be provided for from operating expenditure

(*Confirm that the amount, is anticipated to be an operating cost and is provided for as such in the Mining work programme, Financial and Technical Competence Report or Prospecting Work Programme as the case may be).*

Giza Minerals will provide for the closure liability cost following authorisation of the project

15.3. Deviations from the approved scoping report and plan of study.

15.3.1. Deviations from the methodology used in determining the significance of potential environmental impacts and risks.

(Provide a list of activities in respect of which the approved scoping report was deviated from, the reference in this report identifying where the deviation was made, and a brief description of the extent of the deviation).

There is no deviation for the proposed underground mining and waste Management Licence.

15.3.2. Motivation for the deviation.

There is no deviation for the proposed underground mining and waste Management Licence

16. Other Information required by the competent Authority

16.1. 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: -

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

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

Impact on any national Heritage Resource has been discussed on the Heritage Study report which form part of this report

16.2. 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)**.

None

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

17. Draft Environmental Management Programme.

17.1. Details of the EAP,

(Confirm that the requirement for the provision of the details and expertise of the EAP are already included in PART A, section 1(a) herein as required).

The details of the EAP is already included in Part A of this report, **See Appendix 1**

17.2. 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).

The details of the aspects of the activity are described above in Part A section 4.2.

17.3. 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)*

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. (**See Appendix 5**)

17.4. Description of Impact management objectives including management statements

17.4.1. Determination of closure objectives.

(ensure that the closure objectives are informed by the type of environment described in 2.4 herein)

The affected parties play a role in determining the end land use Rehabilitation objectives need to be tailored to the Project at hand and be aligned with the Environmental Management Plan (EMP). Therefore, the overall rehabilitation objectives for the proposed Project are as follows:

- Provide for a sustainable post-mining land use and re-establishment of the pre-mining land use/capability; Implement concurrent rehabilitation measures where possible
- Prevent soil, surface water and groundwater contamination;

- Comply with the relevant local and national regulatory requirements; and
- Maintain and monitor the rehabilitated areas.
- Restoration of previous land use capability
- No biodiversity loss

17.4.2. The process for managing any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of undertaking a listed activity.

The purpose of an EMPr is to describe the process of managing the identified potential environmental impacts or risks throughout the entire life cycle (from design, to implementation and operation) of the proposed Giza minerals underground mining project.

Continual improvement is achieved by periodically monitoring and reviewing the EMPr and the subsequent implementation of corrective actions when required. Therefore, this document should be considered as a living document which should be continuously updated and possibly improved. This approach taken in the development of the EMPr is in line with the requirements stipulated in GN R. 982 (2014 EIA regulations) as amended.

Throughout the development of management measures all legislative and other requirements associated to the proposed Project activities were considered and highlighted.

A number of specialist investigations formed part of the EIA process and resulted in a number of findings and recommendations. These reports provided specific mitigation and management measures as a recommendation. These findings have been considered throughout the development of the EMP.

17.4.3. Potential risk of Acid Mine Drainage.

(Indicate whether or not the mining can result in acid mine drainage).

The proposed activity has a potential for Acid mine drainage (AMD). AMD comes mainly from abandoned Gold mines and currently active mining. The acid runoff further dissolves heavy metals such as copper, lead, mercury into ground or surface water.

The formation of the AMD could occur as a result of the ingress of water and oxygen into strata containing sulfide minerals. Local patches of water in contact with only carbonaceous material will be acidic as the carbonate minerals are not efficient to neutralize the acid produced. As the area gets flooded these acidic parts will come within contact with the neutral-alkaline drainage from the silicate minerals.

17.4.4. Steps taken to investigate, assess, and evaluate the impact of acid mine drainage.

A continuous acid rock drainage (ARD) assessment programme throughout life of the project to properly manage potentially acid generating materials and to inform closure strategies for potential long-term liabilities.

17.4.5. Engineering or mine design solutions to be implemented to avoid or remedy acid mine drainage.

Contaminated water has the capacity to pollute the underlying groundwater resource and ability to form acid mine drainage. As a result, it can be controlled or contained though Construction of Pollution Control Dams (PCD's)

17.4.6. Measures that will be put in place to remedy any residual or cumulative impact that may result from acid mine drainage.

All water ingress into the processing plant during operation must be assumed to be polluted and if removed must be contained in an appropriately lined PCD

17.4.7. Volumes and rate of water use required for the mining, trenching or bulk sampling operation.

During the operation of this project, water will be required for the following activities:

- Dust suppression
- Workshops and offices
- Domestic use

17.4.8. Has a water use licence has been applied for?

Water use licence has been applied at Department of water and sanitation.

17.5. Impacts to be mitigated in their respective phases. *(Measures to rehabilitate the environment affected by the undertaking of any listed activity).*

Table 15: Impacts to be mitigated in their respective phases

ACTIVITIES (as listed in 2.11.1)	**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 alluvial diamond prospecting as the

					case may be.

Office Construction	Planning	1000 Square metres	• Do not Mix cement on ground but in a plastic or slab to avoid land contamination. • Site camp must be demarcated before any activity can be undertaken. • water will be used during crushing and screening process to control dust emissions	Site manager must ensure compliance with the guidelines as stipulated in the Environmental Impact Assessment and Environmental management report.	During planning phase

Accidental spillages	Planning and Operational	/	• Any spillage will be recorded and remedial action taken immediately • Trays used to trap hydrocarbons • Absorbent agents to be used to trap hydrocarbons and grease • Any spillage will be recorded and remedial action taken Immediately	Site manager must ensure compliance with the guidelines as stipulated in the Environmental Impact Assessment and Environmental management report.	During Planning and Construction Phase

Disposal of general Waste	Operational and Decommissioning	10 Tonnes	• Place waste receptacles at strategic points • Monitor housekeeping behaviour and insist on corrective action • Waste will be disposed of in approved landfill site	Appointed Environmental Control Officer will monitor this.	During operational Phase

Earth works	Construction	5 Hectares	• Topsoil replacement should be done systematically; slopes should be kept low to prevent run-off and erosion, and replaced according to the soil types. • The topsoil stockpiles should be vegetated as soon as possible to prevent erosion, which might cause siltation of the water resources. • Avoid compaction of topsoil.	Impact Control	During Construction Phase

Equipment maintenance	Operational	100 Square metre	• Control and manage storm water • Prevent soil erosion and keep water channel clean, monitor groundwater	Clean Equipment and in good working condition	Equipment maintenance should be done one in every 6 months

Excavation and Hauling of Rocks	Operational	10 Hectares	• Warning of heavy vehicles must be indicated. • Hauling Roads should be clearly Demarcated • Dust suppression twice a day to minimise dust	Speed limit must be restricted to 40km/h to avoid animal hitting.	During operational

Transportation of raw material to site	Construction and Operational		• Limit vehicles coming to the site and limit to a temporary minimal duration. • Maintain and/or upgrade the gravel road. • Effective signage and traffic control measures along the road.	Speed limit must be restricted to 40km/h to avoid animal hitting	Construction and Operational Phase

Waste rock management	• Operation • Decommissioning • Closure (final land form)	1 hectare	• Waste rock will be used to backfill the pit area owned by Gold Plate as part of Pit Rehabilitation and preventing possibility of Acid Mine Drainage	Impact Avoided	Operational Phase

Storm water management	• Operational • Decommissioning		• Regularly do monitoring for erosion and address the matter when present through the rehabilitation of the area and addition of structures to slow the surface runoff. • Keep clean water (e.g. rainwater) clean and route it to a natural watercourse through a separate system from the dirty water system. • Collect and contain dirty water in a system separate from the clean water system. • Prevent dirty water from spilling or seeping into clean water systems.	Compliance with Storm water management Specialist recommendations.	From Commencement of the operations of the activity until the entire project is completed.

			• Apply the storm water management plan to the entire life cycle of the mine and over different hydrological cycles (rainfall patterns)		

Site support services	Construction, Operational and decommissioning		• Pave the tyre positions of vehicles to ensure a small area is impacted	Incident Management	During operational phase

Rehabilitation	• Construction • Operation • Decommissioning • Closure		• Replacing soil, slope • stabilization, • landscaping, re-vegetation, • restoration	Apply for decommissioning	Closure Phase

17.6. 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. • 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.

17.7. 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	**POTENTIAL IMPACT**	**MITIGATION TYPE**	**TIME PERIOD FOR IMPLEMENTATION**	**COMPLIANCE WITH STANDARDS**
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.).	(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc..… etc.…)	(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. • Modify through alternative method. • Control through noise control • Control through management and monitoring Remedy through rehabilitation.	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 alluvial diamond prospecting as the case may be.	(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)

Clearance of vegetation	• Visual Impacts • Soil Erosion • Habitat Loss • Dust Emission • Loss of Vegetation	• Clearance of an area to be used. • Use existing roads on site • Clearing of vegetation during the day	• Construction	• Rehabilitation standards
Earth works	• Dust Emission • Loss of Vegetation • Slope instability • Visual impacts • Noise generation • Soil structure damage • Automobile emission • Soil compaction • Respiratory constrains	• Use of existing roads	• Construction	• Rehabilitation standards
Stockpiling of construction material	• Visual impacts • Transportation of alien invasive species • Respiratory constrains	• All workers to be proved wit personal Protective clothing	• Construction	• Impact Avoided

Construction of Site offices	• Soil contamination • Ground water contamination	• Build a bunded floor to prevent oil seepage	• Construction	• Rehabilitation Standard
Storm water Management measures.	• Vegetate soil stockpiles and prevent soil erosion.	• Avoid contamination and Divert any dirty water to suitable storage facility.	• Construction	
Transportation of Raw materials to site	• Dust emissions • Traffic congestion • Pollution of surface water resources • Visual impacts	• Transport all raw materials during the day • Transport all raw materials during the day	• Planning	• Conduct dust suppression
Hauling and Transportation of waste	• Dust Pollution	• Control dust suppression. • Control and minimise vehicle movement • Control monitoring of dust fall to determine if measures are effective	• Operational	• Conduct dust suppression • Rehabilitation Standard

Storage of Raw Materials	• Air pollution from dust emissions during crushing and screening process • Noise nuisance • Health risk	• Storage tanks containing chemicals should be stored in a secure, bunded surface • Procedure for dealing with spillages should be available	• Operational	• Incident management system
Waste and Rock Management	• Pollution of surface water resources • Contamination of groundwater • Soil contamination • Odour	• Any waste generated during construction must be stored in such a manner that it prevents pollution and amenity impacts. • Waste to be disposed off at a deposition area owned by Gold Plats through constructed sludge pipe.	• Operational	• Rehabilitation Plan
Mixing of cyanide	• Soil contamination • Ground and surface Contamination	• There will be an incident management system including procedures and training for dealing with spillage incidents • Major spillage will be reported to the department and remedial action will be taken.	• Operational	• Rehabilitation Plan

		• Contaminated soil at the affected area will be landscaped and rehabilitated		
Dirty water management	• Pollution of surface and ground water resources	• Reuse of water. • Inspect pipes regularly • Change water after few cycle • Not mixing dirty and clean water	• Construction • Operational • Decommissioning	• Rehabilitation Plan
General Waste management	• Land Pollution	• The mine will ensure that good waste management practices are implemented effectively	• Construction • Operational • Decommissioning	• Impact Avoided
Storage and maintenance services/ facilities	• Pollution of surface water resources • Contamination of groundwater • Soil contamination	• Storage will have appropriate runoff system for clean and dirty water and they will be maintained to ensure effectiveness • A maintenance system will be implemented to ensure regular cleaning of surface area • Clean and dirty water must be	• Operational	• Impact Avoided

		separated.		
Site support services	• Air pollution • Visual Impacts	• Employees will be trained on general awareness with regards to water, electricity and other resources saving and minimisation of use. • Such training will happen on a regular basis to ensure that there is continuity	• Operational	• Incident Management
Demolition Dismantling, demolition, removal of equipment	• Hazardous structures/excavations • Loss of soil resources and land capability • Disturbance of biodiversity • Air pollution • Disturbing noise	• Appropriate measure will be identified in consultation with specialist	• Decommissioning	• Rehabilitation Plan

18. Financial Provision

18.1. Determination of the amount of Financial Provision

18.1.1. Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under Regulation 22 (2) (d) as described in 2.4 herein.

- Rehabilitate the disturbed area to be used for future development
- Backfilling the pit that is owned by Gold Plate.
- Removing all infrastructure and all other items used and constructed during mining period
- All waste will be removed and be disposed properly.
- Rehabilitate the footprint of the underground mine.
- Final rehabilitation will be completed within specified period as guided by the Regional Manager.

18.1.2. Confirm specifically that the environmental objectives in relation to closure have been consulted with landowner and interested and affected parties.

This Environmental Impact Assessment and Environmental Management Plan will be made available to each registered stakeholder for review and comment. All comments will be captured in the issues and response section and will be included into the final report.

18.1.3. 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

Rehabilitation Plan will be attached on the Final EIR and EMPr

18.1.4. Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives.

- The rehabilitation actions that Giza minerals intend on undertaking at the end of the life of project are designed to comply with the requirements of the closure objectives.

- To progressively reinstate a post-mining landscape that improves local spatial development patterns and maximises socio-economic opportunities.

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

Table 16: Quantum Calculation

No.	Description	Unit	A	B	C	D	E=A*B*C*D
			Quantity	Master Rate	Multiplication factor	Weighting factor 1	Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	400	R 11.59	0.052	0.52	R 125.36
2 (A)	Demolition of steel buildings and structures	m2	300	R 161.45	0.52	0.52	R 13,096.82
2(B)	Demolition of reinforced concrete buildings and Structures	m2	300	R 237.92			R -
3	Rehabilitation of access roads	m2	100	R 28.89	0.52	0.52	R 781.19
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	R 280.41	0	0	R -
4 (A)	Demolition and rehabilitation of non-electrified railway Lines	m	0	R 152.95	0	0	R -
5	Demolition of housing and/or administration facilities	m2	0	R 322.89	0	0	R -
6	**Opencast rehabilitation including final voids and Ramps**	**ha**	**0.5**	**R 169,263.66**	**1**	**1**	**R 84,631.83**

7	Sealing of shafts adits and inclines	m3	0	R 86.67	0	0	R -
8 (A)	Rehabilitation of overburden and spoils	ha	0.5	R 112,842.22	1	0.52	R 29,338.98
8 (B)	Rehabilitation of processing waste deposits and Evaporation ponds (non-polluting potential)	ha	0.4	R 140,543.22	1	1	R 56,217.29
8 (C)	Rehabilitation of processing waste deposits and Evaporation ponds (polluting potential)	Ha	0.5	R 408,204.13	1	0.52	R 106,133.07
9	Rehabilitation of subsided areas	Ha	0	R 94,488.55	0	1	R -
10	**General surface rehabilitation**	**Ha**	**2**	**R 89,390.25**	**1**	**0.52**	R 92,965.86
11	River diversions	Ha	0	R 89,390.25	0.52	1	R -
12	Fencing	M	1000	R 101.97	1	1	R 101,970.00
13	Water management	Ha	0	R 33,988.69	1	1	R -
14	2 to 3 years of maintenance and aftercare	Ha	10	R 11,896.04	0.52	0.52	R 32,166.89
15 (A)	Specialist study	Sum			0.52	0.52	R -
15 (B)	Specialist study	Sum					
					Sub Total 1		R 517,427.29

1	Preliminary and General	62091.27458	**weighting factor 2**	R 3,228.75
			0.052	

2	Contingencies	51742.72882	R 51,742.73
		Subtotal 2	R 572,398.76
		VAT (14%)	R 80,135.83
		Grand Total	**R 652,534.59**

18.2.1. Confirm that the financial provision will be provided as determined.

Financial provision required to manage and rehabilitate the environment will be provided as determined though Quantum calculation

19. Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including

19.1. Monitoring of Impact Management Actions

Giza Minerals will implement an ongoing monitoring programme for its proposed operations as recommended, ensuring environmental requirements stipulated in this EMP are complied with. The following impacts and environmental components are being monitored:

- Surface water;
- Groundwater;
- Air quality; and
- Noise;
- Closure and rehabilitation.

19.2. Monitoring and reporting frequency

The monitoring of impacts and reporting frequency will be different for the various environmental aspects.it can be monthly, quarterly or annually.

19.3. Responsible persons

A site Manager will be responsible for ensuring that all necessary environmental monitoring required for this project is undertaken as per the monitoring programmes.

19.4. Time period for implementing impact management actions

Impact management actions will be undertaken throughout each phase of the project, which includes construction, operation, closure

Table 17: 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
Underground Mining Activities	Pollution of surface and ground water	A grab surface water sample will be required from watercourses around the project area.	A grab surface and ground water sample will be required from watercourses around the project area.	• A grab surface water sample will be required from watercourses around the project area.
	Increase in dust fallout affecting adjacent landowners/households.	dust buckets.	Site Manager will be responsible for sourcing the necessary specialist to undertake the dust fallout monitoring.	• Dust fallout will be monitored on a monthly basis. • An annual report will be generated to illustrate the findings. • Air quality impacts will be managed immediately should monitoring detect an increase in nuisance dust. • Management actions will be applicable for all phases of the Project.

	General rise in ambient noise levels	Noise readings undertaken with a hand-held monitoring device will be required.	The site manager will be responsible for sourcing the necessary specialist to undertake the noise monitoring.	• During construction, noise monitoring will be undertaken on a monthly basis.
				• During operation, noise monitoring will be undertaken on a quarterly basis.
	Rehabilitation Progress	Internal monitoring, auditing and reporting – update the plan to account for changes to the environment and risk profile, update the liability assessment; External monitoring, a review undertaken by financial auditors, forms part of the annual financial/accounting audit	Environmental Control Officer	Both internal and external audit to be undertaken on an annual basis

19.6. Indicate the frequency of the submission of the performance assessment report.

The performance assessment report will be submitted to the competent authority annually.

20. Environmental Awareness Plan

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

An Environmental Awareness and Risk Assessment Schedule have been developed and is outlined below. The purpose of this schedule is to ensure that employees are not only trained but that the principles are continuously re-enforced

Table 18: Environmental Awareness and Risk Assessment

Frequency	Time Allocation	Objective
Induction (all staff and workers)	1-hour training on environmental awareness training as part of site induction	• Develop an understanding of what is meant by the natural environmental and social environment and establish a common language as it relates to environmental, health, safety and community aspects. • Establish a basic knowledge of the environmental legal framework and consequences of non-compliance. • Clarify the content and required actions for the implementation of the Environmental Management Plan. • Confirm the spatial extent of areas regarded as sensitive and clarify restrict ions. • Provide a detailed understanding of the definition, the method for identification and required response to emergency incidents.
Monthly Awareness Talks (all staff and workers)	30-minute awareness talks	Based on actual identified risks and incidents (if occurred) reinforce legal requirements, appropriate responses and measures for the adaptation of mitigation and/or management practices.

Risk Assessments (supervisor and workers involved in task)	Daily task based risk assessment	Establish an understanding of the risks associated with a specific task and the required mitigation and management measures on a daily basis as part of daily tool box talks.

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

As prescribed in above table, Task/Issue Based Risk Assessments must be undertaken with all worker involved in the specific task in order to establish an understanding of the risks associated with a specific task and the required mitigation and management measures.

- **Environmental Awareness Training Content – Induction Training**

The following environmental awareness training will be provided to all staff and workers who will be involved in borrow pits activities.

- ✓ Description of the approved Mining Right and Waste Management license activities and content of the right
- ✓ An overview of the applicable legislation and regulations as it relates to environmental, health, safety and community including (but not limited to):
    - ❖ General Environmental Legal Principles and Requirements
    - ❖ Air Quality Management
    - ❖ Water and Wastewater Management
    - ❖ Hazardous Substances
    - ❖ Non-Mining-Related Waste Management
    - ❖ The Appropriate Remediation Strategies & Deteriorated Water Resources
    - ❖ Biodiversity
    - ❖ Weeds and Invader Plants
    - ❖ Rehabilitation
    - ❖ Contractors and Tenants
    - ❖ Energy & Conservation
    - ❖ Heritage Resources
    - ❖ General Health and Safety Matters
    - ❖ Basic Conditions of Employment

- ❖ Compensation for Occupational Injuries and Diseases
- ❖ General Mine Health and Safety Matters
- ❖ Smoking in the Workplace
- ❖ Noise & Hearing Conservation
- ❖ Handling, Storage and use of Hazardous Substances
- ❖ Weapons and Firearms

✓ Content and implementation of the approved Environmental Management Plan

- ❖ Al located responsibilities and functions
- ❖ Management and Mitigation Measures
- ❖ Identification of risks and requirements adaptation

✓ Sensitive environments and features

- ❖ Description of environmentally sensitive areas and features
- ❖ Prohibitions as it relates to activities in or in proximity to such areas

✓ Emergency Situations and Remediation

- ❖ Methodology to the identify areas where accidents and emergency situations may occur, communities and individuals that may be impacted
- ❖ An over view of the response procedures,
- ❖ Equipment and resources
- ❖ Designate of responsibilities
- ❖ Communication, including communication with potentially Affected Communities
- ❖ Training schedule to ensure effective response

The following procedures will be developed, all staff and workers will be adequately trained on the content and implementation thereof.

- **Emergency Preparedness and Response**

The procedure will be developed to specifically include risk identification, preparedness, response measures and reporting. The procedure will specifically include spill and fire risk, preparedness and response measures. The appropriate emergency control canters (fire department, hospitals) will be identified and the contact numbers obtained and made available on site. The procedure must be developed in consultation with all potentially affected landowners.

In the event that risks are identified which may affected adjacent landowners (or other persons), the procedure will include the appropriate communication strategy to inform such persons and provide response measures to minimize the impact.

- **Incident Reporting Procedure**

Incident reporting will be undertaken in accordance with an established incident reporting procedure to (including but not limited to):

- ✓ Provide details of the responsible person including any person who: (i) is responsible for the incident; (ii) owns any hazardous substance involved in the incident; or (iii) was in control when the incident occurred;
- ✓ Provide details of the incident (time, date, location);
- ✓ The details of the cause of the incident;
- ✓ Identify the aspects of the environment impacted;
- ✓ The details corrective action taken, and
- ✓ The identification of any potential residual or secondary risks that must be monitored and corrected or managed.

- **Environmental and Social Audit Checklist**

An environmental audit checklist will be established to include the environmental and social mitigation and management measures as developed and approved as part of the Environmental Management Plan. Non-conformances will be identified and corrective action taken where required.

21. Specific information required by the Competent Authority (Among others, confirm that the financial provision will be reviewed annually).

Financial provision will be reviewed Annually as is specified by Department of Mineral Resource (DMR).

22. References

- Airshed Planning Professionals (2015) Atmospheric Impact Report: Application for postponement of the minimum emission standards at the AEL Mining Services: Modderfontein Industrial Complex. Report No: 14AEL01
- Ekurhuleni Metropolitan Municipality, Integrated Development Plan (IDP), Budget and SDBIP 2015/16-2017-18,
- Le Rux J. (2002) the biodiversity of South Africa 2002 Indicators. Trends and Human Impacts. Struik Publishers, Cape Town
- Low A.B. and Rebelo A.G. (1998) Vegetation of South Africa, Lesotho and Swaziland. DEAT, Pretoria.
- Oryx Environmental (2005) Isidleke Development, Modderfontein: Environmental Impact Report. Prepared on behalf of: Heartland Properties (Pty) Ltd. Volume 1: Main Report
- Seaton Thomson & Associates (2009) Preliminary Faunal Survey: Habitat Assessment for the Modderfontein Outfall Sewer.

23. UNDERTAKING

The EAP herewith confirms

(a) the correctness of the information provided in the reports [X]

(b) the inclusion of comments and inputs from stakeholders and I&APs; [X]

c) the inclusion of inputs and recommendations from the specialist reports where relevant and; [X]

(d) the acceptability of the project [X]

-END-

Appendix 1: Qualification of EAP

SACNASP

South African Council for Natural Scientific Professions

NDOBELA AND LAMOLA INC
2012/054908/21
P O Box 11057, The Tramshed
Pretoria 0126
reception@nlinc.co.za
Tel: 012 346 6710 Fax: 012 346 6689

LAMOLA RONALD OZZY
Practising Attorney / Commissioner of Oaths
NDOBELA AND LAMOLA Incorporated
972 Justice Mahomed Street
Brooklyn
Pretoria 0181

herewith certifies that

Ngwedzeni Moudy Mudzielwana

Registration number: 300047/15

is registered as a

Certificated Natural Scientist, Level B

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)
in the following field(s) of practice (Schedule I of the Act)

Environmental Science **11 March 2015**

11 March 2015
Pretoria

President

Executive Director

University of Venda

This is to Certify
that the Degree of

Bachelor of Environmental Sciences

was Awarded to

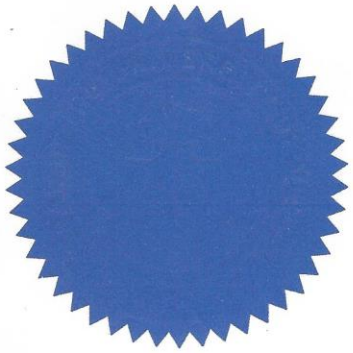
MUDZIELWANA NGWEDZENI MOUDY

at a Ceremony held on the

20-OCT-2001

in Accordance with the Provisions of the
Act and Statute

Vice Chancellor



Registrar

Dean

YUNIBESITI YA BOKONE-BOPHIRIM
NORTH-WEST UNIVERSI
NOORDWES-UNIVERSITE

Potchefstroom Campus

This is to certify that

NM MUDZIELWANA

attended the course

Environmental Impact Assessment: The NEMA Regulations - A Practical Approach

CEM-05.1

NQF Level: 5

28 May - 2 June 2007

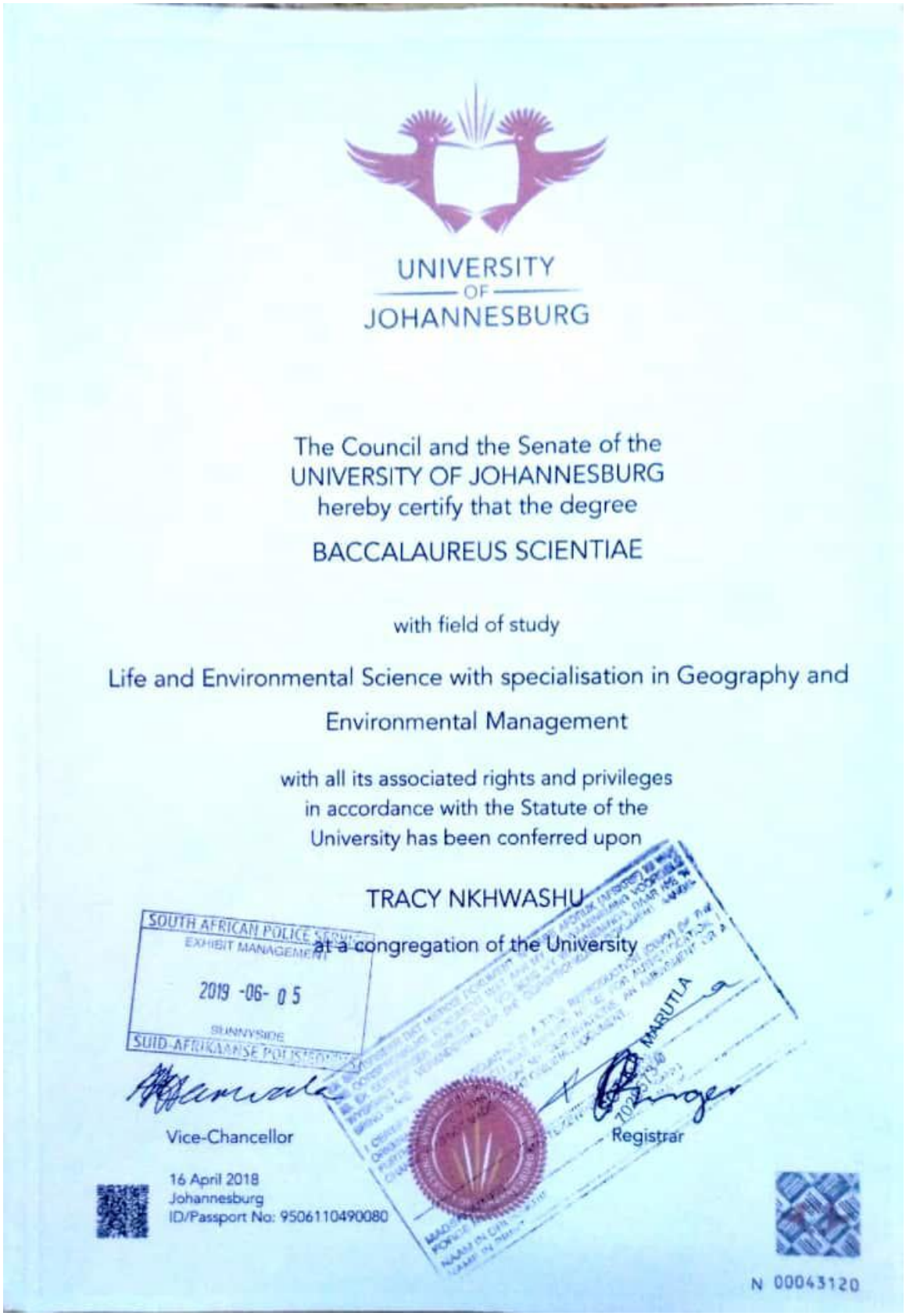
CEM
Centre for Environmental Management

Prof. JG Nel
Executive Manager: Centre for Environmental Management
Course Leader

Prof. JJ Pienaar
Dean Faculty of Natural Science

CEM-05.1/0044/07

Tracy Nkhwashu Qualifications



UNIVERSITY
OF
JOHANNESBURG

The Council and the Senate of the
UNIVERSITY OF JOHANNESBURG
hereby certify that the degree

BACCALAUREUS SCIENTIAE

with field of study

Life and Environmental Science with specialisation in Geography and Environmental Management

with all its associated rights and privileges
in accordance with the Statute of the
University has been conferred upon

TRACY NKHWASHU

at a congregation of the University

SOUTH AFRICAN POLICE SERVICE
EXHIBIT MANAGEMENT
2019 -06- 05
SUNNYSIDE
SUID-AFRIKAANSE POLISIEDIENS

MARUTLA

Vice-Chancellor

Registrar

16 April 2018
Johannesburg
ID/Passport No: 9506110490080

N 00043120

Appendix 2: Curriculum Vitae

Mudzielwana Ngwedzeni Moudy CV Abridged with Company Profile

TSHIKOVHA ENVIRONMENTAL & COMMUNICATION CONSULTING

TSHIKOVHA GREEN & CLIMATE CHANGE ADVOCATES (PTY) LTD

We Advocate For Environmental Compliance Throughout Business Value Chain

PROFILE

- Managing Director at Leading Environmental Management Firm
- Seasoned Environmental Consultant

PROFESSIONAL MEMBERSHIPS

- Member of the International Association for Impact Assessment
- Member of IWMSA
- Member of ELA
- Member of SAIOSH
- Member of IAIASA

EXECUTIVE SUMMARY

Tshikovha environmental and communication consulting is a reputable Environmental management company which seeks to be a national leader in the field. Conceived in 2005 the company has achieved milestones exceeding a lot of its older counterparts. Ares of specialization and focus include but are not limited to:

- Environmental Impact Assessments
- Waste Management Strategies
- Integrated Waste Planning
- Environmental Performance Assessment
- Environmental and Waste Management Accredited Training
- Facilitation and many more

MY ROLE AND PROFILE

I am the founder and Managing Director of the company and my role and key deliverables include but not limited to:

- Business development (Lead generation)
- Projects and contracts management
- Process Implementation and management

Some of the projects covered include environmental Impact Assessment, Waste Management Strategies, Integrated Waste Planning, Environmental Performance Assessment, Environmental and Waste Management Accredited Training, Facilitation and many more.

My role to assist your organization is being hands in management of all projects contracts and management of implementation process and provide solution to challenges facing the organization. My background in education and other accolades I learned in my period of my experience in the field has advanced my company operation into renowned Environmental and Waste Management consulting firm.

I possess a BSc in Environmental Science as well as several certificates and training in the following areas:

- **BSc Environmental Sciences**University of Venda for Science and Technology
- **Master's In Business Administration (Current)** Regenesys Business School

COMPANY AND PERSONALDETAILS

Office location: 260 Troye street, muckleneuk Pretoria 0002

Residential:, 13 blandze, Rynfield, Benoni, 1500

Email:moudy.mudzielwana@tshikovha.co.za
tshikovha@tshikovha.co.za

Website:	www.tshikovha.co.za
Cell:	076 431 1016
Sex:	Male
DOB:	21 March 1979
Age:	39
Nationality:	South African
Marital Status:	Married with 1 dependent
Languages:	English, Tshivenda, IsiZulu, Northern Sotho, Tsonga and SiSwati

PROFESSIONAL SKILLS

- Environmental Impact Assessment & Management Systems
- Communications Management
- Environmental Law
- Waste Management Plans
- Feasibility Studies and Capacity Building
- Landfill Operational and Developmental Plans
- Social and Site Audits
- Project Management, Proposals and Budgeting
- Stakeholder and Public Coordination Management
- Leadership, Supervisory and Mentoring skills
- Site Management
- Health and Safety Reports

COMPUTER SKILLS

Microsoft Office (Excel, Ms Word, MS Access, Power point), Internet, GIS ArcView 3.2

ACADEMIC QUALIFICATIONS

1997 ***Matriculated*** Ratshilumela Secondary School

- *Environmental Law WESSA 2005*
- *Business Administration, University of Johannesburg 2012*
- *Emotional Intelligence, Maurice Kerrigan*
- *Environmental Impact AssessmentUniversity of North West*
- *Project ManagementGolder Associates 2005*
- *RecyclingBavaria and South African government Initiative 2006*
- *Earth Sciences*
- *Training in Basic JournalismUniversity of Pretoria & Caxton 2003*
- *Integrated Waste ManagementInstitute of Waste Management 2005*
- *Proposal Writing Nfold 2013*
- *Winning Bids Nfold 2013*
- *Effective Speaking and Presentation SkillsMaurice Kerrigan 2005*
- *Data Capturing*
- *Ecology and Resource Management*
- *Environmental Education*
- *Communication Science*

COMPETITIVE ADVANTAGE

I offer a strong value proposition that is hard to beat in the market in experience and work delivery quality and output.
I have worked in various projects and participated in National Projects that are the historic in the country such as:

- *Project Management on Erosion Control and Earthworks for Eskom Kusile working for TTOLB Projects*
- *Development of General Waste Facilities Standards for Gauteng Department of Agriculture and Rural Development*
- *Integrated Waste management for Vhembe District Municipality*
- *Training of 450 Local Municipalities officials on Waste Management Service Delivery with Institute of Waste Management*
- *Training of 450 Local Municipalities officials on Landfill Operation with Khabokedi Waste Management*

Since I started Tshikovha Environmental and Communication Consulting, the company has grown to a fully developed brand that is competing amongst many within Environmental and Waste Management Industry. I have managed to develop business processes that assist the business to be sustainable and focus on youth development. To assist the business I have completed the following:

- *Business Turn Around Strategy at University of Johannesburg*
- *Business Strategic Plan with external facilitator*
- *Business Human Resources with DNA and Emergence Growth*
- *Winning Bids and Proposal Writing with Nfold*
- *Accreditation on Proposal writing with Association of Proposal Writers*
- *Assisted graduates to complete their diplomas through training at Tshwane University of Technology*

GROWTH, CLIENT BASE AND BRAND POWER

My client base has grown from individual clients to a variety where we service them on various activities. I have developed my business through marketing and strategic branding to position ourselves in current projects that relate to sustainability within the space of Environmental management. I have participated in various Environmental Impact Assessment projects such as:

- *Basic Assessment for Upgrading Kabokweni Stadium*
- *Basic Assessments for Transnet yard lightings, expansion of iron ore storage and reinforcement of embankment*
- *Environmental Scoping for Solar Energy projects for Moeding, Koster, Virginia and Rossenekal for Lotsha Energy, Matlala Energy and Selexos respectively*
- *Scoping EIA for Gas Pipeline for Sasol Gas and Multotech*
- *Scoping EIA for Bulk water supply for Tokologo Local Municipality*
- *Scoping EIA for Permitting of Secunda and Bethal Landfill Sites*
- *Basic Assessment for bulk Water supply for Magalies Water*

WORK REFERENCES

Company: *Caxton 2001 – 2003 Cadet Report*
Environmental Management Services 2003 – 2004
Position: *Environmental Practitioner*
Reference and Contact:Mr. Liam Whitlow
Phone: *+27 (11) 789 7170*
Fax: *+27 (11) 787 3059*

Company: *Enviro-Fill*
Position: *Landfill Site Supervisor*
Period: *2004-2005*
Reference and Contact:
Cell: *082 553 2833*
Land Line: *011 792 9330*
Fax-to-email: *086 504 4345*
Email: *leong@interwaste.co.za*

Company: *Zitholele Consulting*
Position: *Environmental Practitioner*
Period: *2005-2006*
Reference and Contact: *Solly Manyaka*
Cell: *079 505 6684*
Tell: *+27 348 2014*
Fax: *086 551 9788*
Email: *smanyaka@kaleoconsulting.co.za*

Company: *BKS*
Position: *Environmental Practitioner*
Period: *2006-2007*
Reference and Contact:MR Peter Teurlings
Cellular No: *084 589-7089*
Tel No: *012 421-3500*
Fax No: *012 421-3501*

Company: *PDNA*
Position: *Environmental Practitioner*
Period: *2007 (Month)*
Reference and Contact:Dr Shenaz Moola (Manager: Solid Waste)
Tell: *011 566 8300*
Cellphone: *083 632 3120*
Fax: *011 566 8600*
Email: *shenazm@pdna.co.za*
Website: *www.pdna.co.za*

Company: *Enviroserve*
Position: *Waste Depot and Closed Sites Manager*
Period: *2006 (6 Month)*
Reference: *Esme Gombalt*
Brickfield Rd Germiston 1411
Tell:011 456 5400

Company: *Pangaea Worley Parsons*
Position: *Environmental Control Officer2007 (six Month)*
Reference and Contact:Pieter De Klerk
Tell: +27 12 745 2000 Fax: +27 12 745 2001

Ms Tracy Nkhwashu

TSHIKOVHA GREEN &
CLIMATE CHANGE ADVOCATES (PTY) LTD

We Advocate For Environmental Compliance Throughout Business Value Chain

CURRICULUM VITAE

Tracy Nkhwashu

PERSONAL DETAILS

Surname:	Nkhwashu
First Names:	Tracy
Gender:	Female
Date of Birth:	11 June 1995
Nationality:	South Africa
Identity Number:	9506110490080
Marital Status:	Single
Contact Numbers:	0736634116
Email Address:	tracy.nkhwashu@tshikovha.co.za
Postal Address:	147 Vandag Building
	Steve Biko Street
	Sunnyside
	0002
Residential Address:	Same as above
Religion:	Christianity
Home Language:	Xitsonga

Other Languages

Language Proficiency	English	Zulu	Sepedi	Setswana
Speak:	Good	Good	Good	Good
Write:	Good	Fair	Fair	Poor
Read:	Good	Poor	Fair	Poor

Educational Information

Tertiary	Degree(s)	Period
University of South Africa University of Johannesburg	BSc Hons Environmental Management BSc Life and Environmental Sciences	Current 2015-2017
Last Schools Attended	**Highest Grade Passed**	**Period**
Sedan High School	Grade 12	2008-2013

Work Experience

Current Position

Position: Environmental	**Organisation: Tshikovha Green and Climate Change Advocates**

Assessment Practitioner	
Duties:	• Knowledge and application of Environmental Legislation • Conducts research, performs studies and surveys to obtain data, and analyses data to advise on or recommend solution • Compiling Environmental Reports (Scoping, Basic and EMPr) • Public participation
Projects Involvement	• Development of Waste Tyre Pyrolysis Plant
Position: Junior Environmental Assessment Practitioner	**Plantago Lanceolata (Pty)Ltd**
Duties	• Conducts research, performs studies and surveys to obtain data, and analyses data to advise on or recommend solution • Knowledge of Environmental Legislation • Conducting Environmental Impact Assessment reports (Scoping and Basic) • Compiling Environmental Reports (EMPr and Compliance Reports)
Projects Involvement	• Development of Tshakhuma Shopping Centre • Development of Makapanstad Agri-hub (Public Participation Process)
Position: Environmental	• **Mulinda Environmental Consulting**

Impact Practitioner (Intern)	
Duties:	• Knowledge of Environmental Legislation • Conducting Environmental Impact Assessment reports (Scoping and Basic) • Compiling Environmental Reports (EMPr and Compliance Reports)
Projects Involvement	• Construction of Sebokeng Street Bridge and Storm water Channel • Rehabilitation of the road R505 from Wolmaranstad (North West) to Wesselbron (Free State)

References

Mr. M Mudzielwana

Managing Director

Tshikovha Green and Climate Change Advocates (Pty)Ltd

Head Office, 206 Troye Street, Muckleunek, Pretoria, 0001

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Email:moudy@climateadvocates.co.za

Mr D. Mulaudzi

Managing Director

Plantago Lanceolata (Pty) Ltd.

CB Centre, 75 Durham Road

Clubview

Centurion

0157

Cell phone Number: +27636340952

Tell Number: 012 441 7001

Email: divhani01@plantago.co.za

Ms Joyce Khorommbi

Managing Director

Mulinda Environmental Consulting

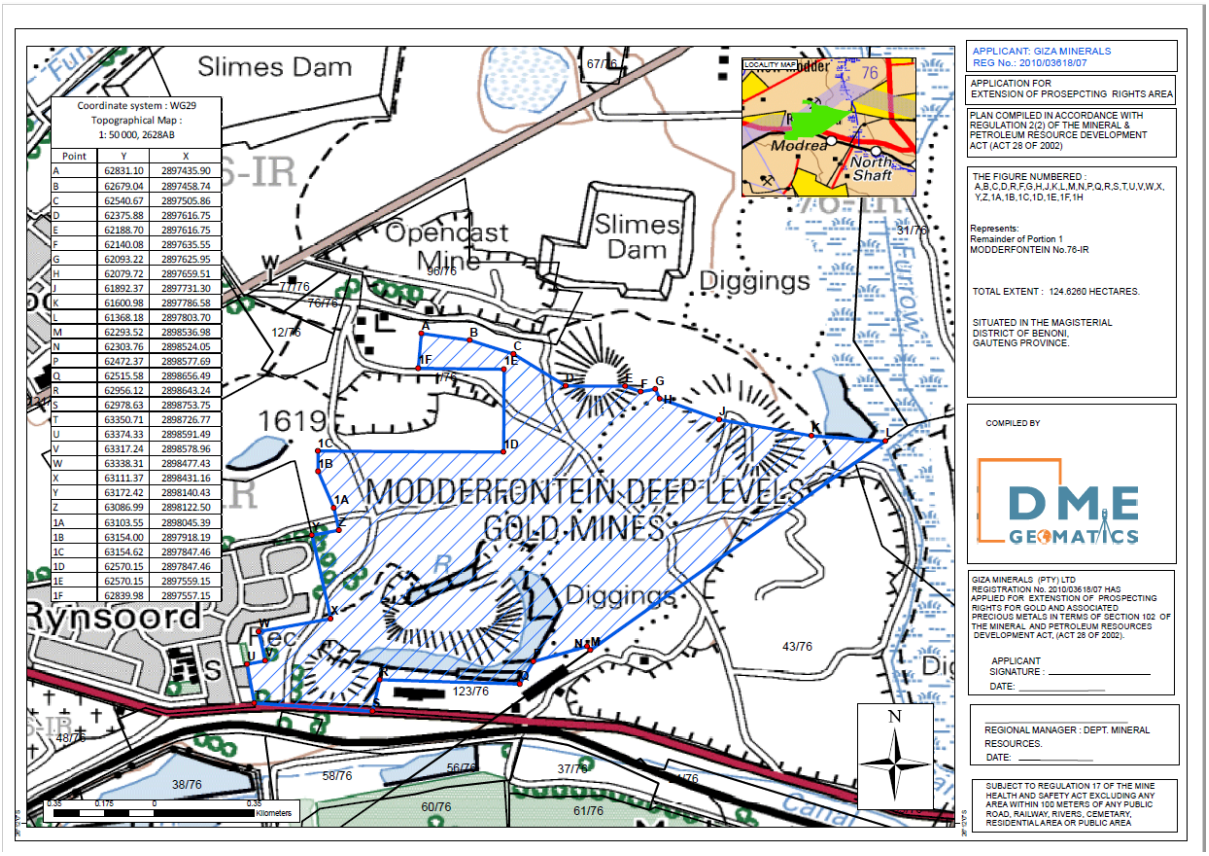
Cell phone Number: +27723616854

Email: joyce.mulinda@yahoo.co.za

Appendix 3: Locality Map


Modder Rd
Mount Mayhem - Pure Rush Industries
goldplat recovery
Chop-Em-Tree Fellers CC
Diesel Performance Truck And Bus
NEW MODDER
Kingsway Intermediate School
Sindy's Plac
Benfarm (Twentyness Inv and Trading)
Albertina Sisulu Primary School
Taxi
Manga Manga Business
Clinic - Dan Khubheka
Actonville Training Centre Special School
Mlambo S L R
Sun
Masjid Tauheed, Rynsoord
Tsalanang
R29
RYNSOORD
KINGSWAY
Kingsway Rd
Main Reef Rd
Soil King
Rynsoord Muslim Kabrastaan
Atoll Metal Recovery (Pty) Ltd t/a Atoll Mining
Benoni Jewish Cemetery - Rynsoord
Clothing stores
Icon Brick & Cement East
ESA Installations
Hospital Rd
Ontime Readymix Brakpan Office
Manhattan Corporation
Map
The Rock Raceway
Google
Imagery ©2020 CNES / Airbus, Maxar Technologies, Map data ©2020 AfriGIS (Pty) Ltd
South Africa
Terms
Send feedback

Appendix 4: Reg2(2) Plan



Appendix 5: Land Use