mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

1st DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

for

IMERYS REFRACTORY MINERALS T/A CAPE BENTONITE MINE

PROPOSED BENTONITE AND ZEOLITE MINING

on

ERVEN 1401, 1199 AND 2924

HEIDELBERG, WESTERN CAPE

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: Imerys Refractory Minerals South Africa t/a Cape Bentonite Mine

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FILE REFERENCE NUMBER SAMRAD: (still to be obtained use project title as reference)

DMR REFERENCE NUMBER: (still to be obtained use project title as reference)

DATE: January 2019

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1) 1st DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME (January 2019)

a) Details of the EAP

Name of The Practitioner: Johmandie Pienaar (Giliomee)
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Johmandie Pienaar (Giliomee) holds a Baccalaureus Technologiae Degree (Cum Laude) in Nature Conservation from the Cape Peninsula University of Technology and has also completed the following short courses at the Centre for Environmental Management:

- Implementing Environmental Management Systems (ISO 14001)(2009);
- Occupational Health and Safety Law for Managers (2010);
- Implementing an OHS Management System based on OHSAS 18001 (2010) and;
- Occupational Health and Safety Management System OHSAS 18001 Audit: A Lead Auditor Course Based on ISO 19011 and ISO 17021 (2011).
- Conduct Outcome Based Assessment (May 2015).

Johmandie has been involved in environmental management and assessment aspects since 2005 having worked for South African National Parks and then as an private Environmental Manager for an estate in the Swartland.

Since March 2009 Johmandie has been practicing as an Environmental Assessment Practitioner, as part of an environmental consultancy company, on several projects throughout South-Africa and mainly within the Western Cape.

Johmandie has also been involved in successfully compiling, coordinating and managing Basic Assessment Reports, Environmental Impact Assessments, Section 24G Applications, NEMA EIA Checklists, Environmental Management Programmes, Waste License Applications, Water Use License Applications, Environmental Rehabilitation Plans, Baseline Biodiversity Surveys for numerous clients.

Johmandie has also conducted and completed numerous Environmental Control Officer jobs, and since 2011 been involved in Occupational Health and Safety Auditing, Managing and Training specializing in the auditing of mining sites and implementing and auditing Occupational Health and Safety Management Systems, and providing training on the implementation of Occupational Health and Safety Management System OHSAS 18001.

(Refer to **Appendix A** of the Draft Scoping Report for EAP CV)

b) Description of the Aspects of the Activity

All potential impacts and aspects as associated with proposed bentonite and zeolite mining activities on the 80ha cultivated agricultural land and surrounds are covered in the EMP. Proposed mining as referred to include all activities associated with the proposed bentonite mining such as any explorations required, site establishment, demarcations, any

excavations, any vehicular movements, any access and internal roads, topsoil and overburden storage, implementation of rehabilitation measures etc.

c) Composite Map

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

Refer to **Appendix B** of the Draft Scoping Report for relevant maps.

d) Description of Impact management objectives including management statements

i) Determination of closure objectives.

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

Mining is conducted 'in-house' by means of excavators, front-end loaders and 15-ton dumper trucks. The mining method comprises of relatively shallow opencast quarrying. The topsoil and the overburden are removed and stockpiled separately along the perimeter of the quarry. As and when the bentonite is being mined, it is trucked to the Processing Plant at the head offices on Erf 1412, Heidelberg.

Overburden is mined in 20m wide and 3-4m thick benches to expose 3m of bentonite down-dip to be mined. This process is repeated until all bentonite is mined out. Through this process the quarries depth will be a maximum of 30m deep, and no more than half of the quarry size will be open at a time.

Rehabilitation takes place on an ongoing basis as mining proceeds. As the quarry advances along strike, the overburden is progressively replaced to backfill the excavation. The backfilled area is then contoured to prevent erosion, which could be caused by rain and surface water flow. Finally the topsoil is then spread over the disturbed surface area to restore the land to its previous state.

The bentonite found on the mining area is emplaced as relatively thin seams of 1-4m thick. The topsoil is normally less than 30cm thick. Overburden consists of a sequence of siltstone with conglomerate lenses; the latter also form the footwall of the succession.

The timing of the several phases is described on the Mine Layout Plan as attached under Appendix B of the Scoping Report.

Main closure/rehabilitation objectives are to rehabilitate the 80ha proposed mining activities area on transformed cultivated agricultural land to previous agricultural potential/state.

If during the mining activities any indigenous vegetation areas or associated watercourse areas within the No-Go Areas are impacted upon by the mining activities these areas must be rehabilitated immediately and prevention measures must be put in place to prevent re-occurrence. Depending on the extent and type of impacts that occurred a qualified Environmental Control Officer must recommend and supervise rehabilitation measures that must be implemented. A suitable specialist must also be appointed to assess the impact/s on the affected environment within the No-Go area and provide suitable rehabilitation measures to be implemented. The ECO must consult with the specialist when determining rehabilitation and prevention measures that must be implemented. Only vegetation indigenous to the applicable area and suitable for the specific impacted site must be used

for rehabilitation of any impacted indigenous vegetation areas. After rehabilitation measures have been implemented the specialist must inspect the rehabilitated areas and if successful provide written confirmation to the ECO that all impacted indigenous vegetation areas and/or associated watercourse areas within the No-Go Areas have been successfully rehabilitated, or if not successful must provide further rehabilitation recommendations which must be implemented. The mining company will be responsible for the rehabilitation on these areas until written confirmation has been obtained from the specialist that the impacted sites have been successfully rehabilitated. Specialist rehabilitation progress reports and/or written confirmation of successful rehabilitation must be appended to the ECO inspection reports to be submitted to the competent authority with the annual environmental compliance audit reports.

Before any mining activities commence, soil fertility samples (in terms of agricultural potential) must be taken at each of the proposed mining areas, by a qualified person and samples must be tested at a certified laboratory. Samples should be taken from the surface to a depth of 25cm so as to include equal amounts of soil over the full depth range between 0 and 25cm.

Topsoil and overburden materials must be stored separately adjacent to the mining areas with effective storm water runoff and erosion prevention measures to be implemented in order to protect the materials. Topsoil stockpiles should be protected against losses by water and wind erosion. The mining plan should be such that topsoil is stockpiled for the minimum possible time by rehabilitating different mining blocks progressively as the mining process continues.

As the excavation of the quarry advances the stored overburden material must be replaced to backfill the excavations. The backfilled area must then be contoured according to existing surrounding contours of the cultivated land to prevent erosion. After contouring has been completed the stored topsoil material must be spread over the backfilled area. The topsoil must not be compacted after spreading to allow the disturbed area to be restored for agricultural use. The site must be monitored regularly (at least 6 monthly and after heavy rains) and all signs of erosion immediately rectified to prevent potential siltation and erosion of natural areas and drainage lines. Only use topsoil as derived and conserved from the proposed mining area to be rehabilitated after mining activities have ceased on the property.

During rehabilitation, the stockpiled topsoil must be evenly spread over the mining surface. Topsoil spreading should be done just before the winter season so that a cover crop can be seeded and established during the winter rains and to control erosion on the newly spread topsoil. If topsoil is spread long before the winter, it will be subject to wind erosion before vegetation can be established on it.

To ensure minimum impact on drainage, it is important that no surface depressions are left after mining. In other words the surface slope must be maintained throughout, including through the edge of the mined area. Surface depressions will result in ponding of water on the surface and accumulation of excess moisture in depression areas. There is sufficient slope and elevation in the proposed mining area to avoid the creation of depressions, provided that mining depths are controlled to ensure the maintenance of a slope. No compaction in the soil should remain after rehabilitation. Compaction will impede water movement through the soil profile. The engineered constructed contours must be reinstated as soon as a phase is completed.

If ripping is required to loosen compaction, this should be done to a depth of at least 30cm, and in such a way that no mixing of the subsoil into the topsoil layer occurs. A cover crop must be established immediately after spreading of topsoil and ripping, to stabilize the soil

and protect it from erosion. Any chemical ameliorants should be spread on the soil before loosening or ploughing or should be done as part of the farmer's planting program.

Alien invasive and weed vegetation monitoring and removal must be undertaken annually during mining and for at least a year after mining activities have ceased on disturbed areas or until the landowner starts with the annual cultivation activities on the affected land. This must be done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner. All invasive alien species as listed by the Conservation of Agricultural Resources Act (CARA) must be removed during these surveys. Declared weeds and aliens must be removed before annual seeding.

Double stripping. Double stripping is a rehabilitation technique that is recommended by the Chamber of Mines (2007). It involves stripping a layer of topsoil, and then a second additional layer below the topsoil. Both of these layers are stockpiled separately and during rehabilitation are spread on the surface in their original sequence. In other words, the subsoil layer is spread immediately on top of the profiled overburden, and the topsoil layer is then spread on top of that. The topsoil layer should be stripped to approximately 30cm depth. Care must be taken by the stripping operator to strip as great a depth of topsoil as possible (up to a maximum of 30cm) without including any of the underlying clay layer as part of the topsoil. So where the clay layer occurs at a shallower depth than 30cm, the stripping must only occur to that shallower depth. The second subsoil stripping should be done to an additional depth of 30cm below the depth to which the subsoil was stripped. The double stripping ensures that the rehabilitated profile contains the original soil material to a depth of 60cm, and that none of the deeper underlying material, that is likely to be too saline to be part of the root zone, occurs within it.

The crop that is sown on the first season of the rehabilitated soil should be a hardy, annual crop that is sown primarily for soil stabilisation and biomass and not necessarily for production. It should be dosed with a high level of nitrogen fertilser in order to maximise vegetative growth and therefore biomass production (both above and below ground). This is likely to be a higher level of fertilisation than would be determined for economic viability in terms of input costs versus production. The increased fertilisation costs should therefore be borne by the mine's rehabilitation budget, and not by the farmer.

Soil fertility samples (in terms of agricultural potential) must be taken at the restored areas similar to soil fertility samples that were taken before mining activities commenced. The fertility of the soil must at least be restored to the soil quality levels that were recorded before mining activities commenced. Samples should be taken in the same way as pre-mining samples to a depth of 25cm. Soil chemical deficiencies must be corrected, based on these samples. A chemical analysis from an agricultural laboratory will include a recommendation of the appropriate quantities of chemical ameliorants (for example lime, phosphate etc) that should be applied to optimize the soil chemistry for the relevant crop. Any chemical ameliorants should be spread on the soil before loosening or ploughing or should be done as part of the farmer's planting program.

When no evidence of erosion and alien vegetation encroachment are visible and similar soil quality levels are reached as before mining activities commenced the mined areas can be considered as successfully rehabilitated.

The mine permit/right holder commits to post-closure maintenance during rehabilitation of the site until the time of receipt of a closure certificate for all or parts of the impacted mining areas, accept for the areas which the landowner plants crops after rehabilitation. In other words once the landowner plants the first crops on the rehabilitated areas the landowner takes further responsibility for impact maintenance of the cultivated areas.

At a rate of R 213 184/ha, the estimate global cost for the rehabilitation of the proposed active quarries of 16.84ha will be R 3 590 018.50.

Total Proposed Rehabilitation Financial Provision for the Mining Right = R 3 590 018.50

Take note: The above mentioned proposed rehabilitation cost is only an estimate, in terms of section 1 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) a holder "*in relation to a prospecting right, **mining right**, mining permit, retention permit, exploration right, production right, reconnaissance permit or technical co-operation permit, means the person to whom such right or permit has been granted or such person's successor in title.*" Therefore the holder of the mining right will remain financially responsible for implementing rehabilitation measures until the set rehabilitation objectives have been met no matter the final costs.

ii) Volumes and rate of water use required for the operation.

NA. The activity will not require any water for its operation.

iii) Has a water use licence been applied for?

Neither applicable nor required.

IMPORTANT NOTE: Although care has been taken to include all relevant mitigation and management measures to ensure that the proposed activities are conducted in compliance with all relevant legislation it still remains the responsibility of the applicant/mining company to ensure that all activities complies with current and up to date legislation. Therefore periodic/annual review of the EMP is recommended to ensure that all requirements are being met. If during the review it is found that the EMP is no longer adequate the EMP must be updated and amended accordingly and submitted to the competent authority for approval.

iv) Impacts to be mitigated in their respective phases

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

ACTIVITIES **(E.g. For prospecting -** drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route **etc…etc…etc.** **E.g. For mining**,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	**PHASE** (of operation in which activity will take place. State; Planning and design, Pre-Mining' Mining, 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.
All activities associated with proposed mining impacting on agricultural land	Before commencement ,during operational phase and rehabilitation/closure	80ha	**Conserving and Rehabilitating Agricultural Land** Compensate the landowner for the temporary loss of agricultural land during mining activities. Before any mining activities commence, soil fertility samples (in terms of agricultural potential) must be taken at each of the proposed mining areas, by a qualified person and samples must be tested at a certified laboratory. Samples should be taken from the surface to a depth of 25cm so as to include equal amounts of soil over the full	Conservation of Agricultural Resources Act, 43 of 1983	Before commencement of mining activities, during operational phase and rehabilitation/closure phase.

			depth range between 0 and 25cm. Topsoil and overburden materials must be stored separately adjacent to the mining areas with effective storm water runoff and erosion prevention measures to be implemented in order to protect the materials. Topsoil stockpiles should be protected against losses by water and wind erosion. The mining plan should be such that topsoil is stockpiled for the minimum possible time by rehabilitating different mining blocks progressively as the mining process continues. As the excavation of the quarry advances the stored overburden material must be replaced to backfill the excavations. The backfilled area must then be contoured according to existing surrounding contours of the cultivated land to prevent erosion. After contouring has been completed the stored topsoil material must be spread over the backfilled area. The topsoil must not be compacted after spreading to allow the disturbed area to be restored for agricultural use. The site must be monitored regularly (at least 6 monthly and after heavy rains) and all signs of erosion immediately rectified to prevent		

			potential siltation and erosion of natural areas and drainage lines. Only use topsoil as derived and conserved from the proposed mining area to be rehabilitated after mining activities have ceased on the property. During rehabilitation, the stockpiled topsoil must be evenly spread over the mining surface. Topsoil spreading should be done just before the winter season so that a cover crop can be seeded and established during the winter rains and to control erosion on the newly spread topsoil. If topsoil is spread long before the winter, it will be subject to wind erosion before vegetation can be established on it. To ensure minimum impact on drainage, it is important that no surface depressions are left after mining. In other words the surface slope must be maintained throughout, including through the edge of the mined area. Surface depressions will result in ponding of water on the surface and accumulation of excess moisture in depression areas. There is sufficient slope and elevation in the proposed mining area to avoid the creation of depressions, provided that mining depths are controlled to ensure the maintenance of a		

			slope. No compaction in the soil should remain after rehabilitation. Compaction will impede water movement through the soil profile. The engineered constructed contours must be reinstated as soon as a phase is completed. If ripping is required to loosen compaction, this should be done to a depth of at least 30cm, and in such a way that no mixing of the subsoil into the topsoil layer occurs. A cover crop must be established immediately after spreading of topsoil and ripping, to stabilize the soil and protect it from erosion. Any chemical ameliorants should be spread on the soil before loosening or ploughing or should be done as part of the farmer's planting program. Alien invasive and weed vegetation monitoring and removal must be undertaken annually during mining and for at least a year after mining activities have ceased on disturbed areas or until the landowner starts with the annual cultivation activities on the affected land. This must be done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the		

			contract agreement that the applicant has with the landowner. All invasive alien species as listed by the Conservation of Agricultural Resources Act (CARA) must be removed during these surveys. Declared weeds and aliens must be removed before annual seeding. Double stripping. Double stripping is a rehabilitation technique that is recommended by the Chamber of Mines (2007). It involves stripping a layer of topsoil, and then a second additional layer below the topsoil. Both of these layers are stockpiled separately and during rehabilitation are spread on the surface in their original sequence. In other words, the subsoil layer is spread immediately on top of the profiled overburden, and the topsoil layer is then spread on top of that. The topsoil layer should be stripped to approximately 30cm depth. Care must be taken by the stripping operator to strip as great a depth of topsoil as possible (up to a maximum of 30cm) without including any of the underlying clay layer as part of the topsoil. So where the clay layer occurs at a shallower depth than 30cm, the stripping must only occur to that shallower		

			depth. The second subsoil stripping should be done to an additional depth of 30cm below the depth to which the subsoil was stripped. The double stripping ensures that the rehabilitated profile contains the original soil material to a depth of 60cm, and that none of the deeper underlying material, that is likely to be too saline to be part of the root zone, occurs within it. The crop that is sown on the first season of the rehabilitated soil should be a hardy, annual crop that is sown primarily for soil stabilisation and biomass and not necessarily for production. It should be dosed with a high level of nitrogen fertilser in order to maximise vegetative growth and therefore biomass production (both above and below ground). This is likely to be a higher level of fertilisation than would be determined for economic viability in terms of input costs versus production. The increased fertilisation costs should therefore be borne by the mine's rehabilitation budget, and not by the farmer. Soil fertility samples (in terms of agricultural potential) must be taken at the restored areas similar to soil fertility samples		

			that were taken before mining activities commenced. The fertility of the soil must at least be restored to the soil quality levels that were recorded before mining activities commenced. Samples should be taken in the same way as pre-mining samples to a depth of 25cm. Soil chemical deficiencies must be corrected, based on these samples. A chemical analysis from an agricultural laboratory will include a recommendation of the appropriate quantities of chemical ameliorants (for example lime, phosphate etc) that should be applied to optimize the soil chemistry for the relevant crop. Any chemical ameliorants should be spread on the soil before loosening or ploughing or should be done as part of the farmer's planting program. When no evidence of erosion and alien vegetation encroachment are visible and similar soil quality levels are reached as before mining activities commenced the mined areas can be considered as successfully rehabilitated.		
Excavations; Loading, hauling and transport creating excessive dust	Operational phase and rehabilitation/ closure phase	80ha	**Excessive Dust** Reduce drop height of material to a minimum. Area will be mined in phases to reduce the barren areas.	The dust generated and fallout will be monitored against the requirements described below and the activity will cease and mitigation measures	Operational phase and rehabilitation/ closure phase

			Temporarily halt material handling in extreme windy conditions. Use non-potable water to dampen bare soil areas if required to mitigate windblown dust. A speed limit of 30km/hour will be displayed and enforced through a fining system. All vehicle drivers entering the site will be informed of the speed limit. Compile and Implement a dust monitoring programme before the commencement of mining activities on site	implemented to ensure that the dust generated as a result of the activity meets the regulatory requirements. The National Dust Control Regulations regulates the following: No person may conduct any activity in such a way as to give rise to dust in such quantities and concentrations that the dust or dust fallout has a detrimental effect on the environment, including health, social, economic, ecological or cultural heritage conditions or has contributed to the degradation of the ambient air quality beyond the premises where it originates from; or that the dust remains visible in the ambient air beyond the premises where it originates from; or if the dust fall at the boundary or beyond the boundary of the premises where it originates exceeds: – 1200 mg/m^2/day averaged over 30 days, measured in accordance with reference method ASTM D1739 (Standard Test Method for Collection and Measurement of Dustfall (Settleable Particulate Matter). It is important to note that people experience dust deposition as a nuisance effect, and that there are no direct human health	

				implications because the dust does not reach the lungs. Indirect effects on human and animal health may result from the deposition of dust containing toxicants onto edible plants. Heavy dust deposition can have detrimental effects on plants if the leaves are smothered to the extent where transpiration and photosynthesis are affected. Particulate Matter). Two dust fallout incidents that exceeds the limit may occur within a year (not sequential months).	
All activities associated with proposed mining potentially causing erosion	Operations phase and rehabilitation/ closure phase	80ha	**Potential Erosion** Visually inspect mining area boundaries, exposed surfaces, overburden and top soil stockpiles for signs of erosion. If erosion channels are discovered the mine must determine the cause of erosion and implement erosion rectification and prevention measures to rehabilitate eroded areas and prevent future erosion. Rehabilitate and reinstate engineered constructed contours as soon as a phase is complete. Undertake mining activities only in identified and specifically demarcated areas as proposed Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit)	Conservation of Agricultural Resources Act, 43 of 1983 and regulations	Operations phase and rehabilitation/ closure phase

			any erosion from occurring on the mining activity areas and surrounds; and any storm water runoff from the mining areas and topsoil and overburden storage areas.		
All activities associated with proposed mining creating noise	Operations phase and rehabilitation/ closure phase	80ha	**Noise** No activities that may generate noise levels above the legal limit in terms of the Environmental Conservation Act, Western Cape Noise regulations will be conducted. Machinery and vehicles should be regularly maintained to prevent excessive noise. All machinery and work activities must adhere to the requirements of the noise regulations.	The standard below will be used to measure noise levels and impacts. Table 2 of SANS 10103:2004 *The measurement and rating of environmental noise with respect to land use, health, annoyance and to speech communication* where the daytime, equivalent continuous rating level is given as 45 dBA for Rural Districts.	Operations phase and rehabilitation/ closure phase
Mine vehicles/machinery	Operations phase and rehabilitation/ closure phase	80ha	**Emissions** Vehicles and machinery on the site will be monitored for excessive emissions. Vehicles and machinery will be maintained to minimize emissions. A log book will be filled in to keep a record of all maintenance problems encountered and mitigation measures implemented to resolve the problem. Vehicles and machinery emitting excessive emissions will be stopped immediately and not allowed to operate until the necessary repairs have been done.	Carbon monoxide (CO) is an odourless, colourless, and poisonous gas. Most CO is formed as a result of incomplete combustion of organic materials used as fuel. CO emissions are highest during incomplete combustion e.g. during idling and low speed mobile source operations, such as vehicle idle. CO enters the bloodstream and reduces oxygen delivery to the body's organs and tissues. Its most serious effects occur at high concentrations, and therefore it tends to be a localized problem. CO may produce adverse health effects such as	Operations phase and rehabilitation/ closure phase

				headaches, work capacity impairment, learning ability impairment, dizziness, weakness, nausea, vomiting, loss of muscular control, increasing and decreasing respiratory rates, collapse, unconsciousness, or death. The health threat from CO is most serious for those who suffer from cardiovascular disease. Healthy individuals also can be affected, but only at higher concentrations. It is not anticipated that the CO emissions levels that is generated will cause the above effects. The occupational exposure limit of CO is 50 parts per million for a 40 hour work week. It is highly unlikely whether this level will be reached in the general environment.	
All activities associated with proposed mining which can cause fire	Operations phase and rehabilitation/ closure phase	80ha	**Fire Management** All employees will be trained on fire safety and on how to reduce the probability of a fire spreading out of control. Anyone who observes a fire must report it immediately to the fire protection agency/ fire brigade and their supervisor/ mine manager. Vehicles must be parked in an area with no vegetation if a fire occurs.	Conservation of Agricultural Resources Act, 43 of 1983 and National Veld and Forest Fire Act, 101 of 1998; and regulations	Operations phase and rehabilitation/ closure phase
Chemical toilets and litter during proposed	Operations phase and rehabilitation/	80ha	**Waste Management** The toilets are serviced when	National Environmental Management: Waste Act (Act	Operations phase and rehabilitation/ closure

mining activities	closure phase		needed and emptied when almost full. If a leak occurs the correct emergency procedure is to be followed (refer to EMP). Litter will be collected and removed from site by the operator on a daily basis.	No 59 of 2008) and regulations	phase
Mine vehicles/machinery	Operations phase and rehabilitation/ closure phase	80ha	**Vehicle/Machine Maintenance** Any mine vehicle which is leaking hydrocarbons (e.g. petrol, diesel or oil) will be serviced in a concreted workshop to repair the leak. If it is not possible to repair the leak immediately, a drip tray will be placed under the leak to trap any spillages. The content of the drip trays will be decanted into an old oil drum for removal from the site to a hazardous waste handling facility. Hydrocarbon spillages are to be cleaned up immediately. The mine will also maintain a store of suitable absorbent material, suitable bioremediation substance and a spill kit. All incidences/ spillages are to be recorded in an incident log book. Contaminated soil must go to Vissershok Hazardous Landfill site.	Hazardous Substances Act, 15 of 1973 and National Environmental Management: Waste Act (Act No 59 of 2008); and regulations	Operations phase and rehabilitation/ closure phase.
Mining activities which may lead to the spread of alien vegetation i.e. soil disturbance	Operations phase and rehabilitation/ closure phase	80ha	**Alien Vegetation Control** Alien invasive and weed vegetation monitoring and removal must be undertaken annually during mining and for at least a year after mining	National Environmental Management: Biodiversity Act 10 of 2004 [NEMBA] and relevant regulations Conservation of Agricultural Resources Act, 43 of 1983	Operations phase and rehabilitation/ closure phase.

			activities have ceased on disturbed areas or until the landowner starts with the annual cultivation activities on the affected land. This must be done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner. All invasive alien species as listed by the Conservation of Agricultural Resources Act (CARA) must be removed during these surveys. Declared weeds and aliens must be removed before annual seeding. Only use topsoil as derived and conserved from the proposed mining area to be rehabilitated after mining activities have ceased on the property		

e) Impact Management Outcomes

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

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. Mining, 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.**
Excavations, loading, hauling, transport and roads	**Increased dust levels**	Natural Environment, road users and nearby residents	Operational, Decommissioning/Closure/ Rehabilitation	Reduce drop height of material to a minimum. Area will be mined in phases to reduce the barren areas. Temporarily halt material handling in extreme windy conditions. Use non-potable water to dampen bare soil areas if required to mitigate windblown dust. A speed limit of 30km/hour will be displayed and enforced through a fining system. All vehicle drivers entering the site will be informed of the speed limit. Compile and Implement a dust	The National Dust Control Regulations regulates. Dust fallout may not exceeds 1200 mg/m^2/day averaged over 30 days, measured in accordance with reference method ASTM D1739 (Standard Test Method for Collection and Measurement of Dustfall (Settleable Particulate Matter). Particulate Matter). Two dust fallout incidents that exceeds the limit may occur within a year (not sequential months).

				monitoring programme before the commencement of mining activities on site	
All activities associated with proposed mining	Mining activities (i.e. The site preparation and removal of topsoil) will cause a disturbance and this disturbance, unless carefully managed, could spread as a result thereof. **Soil erosion** can occur due to wind (wind erosion cause dust pollution); and due to overland storm water flow should rains fall during mining. Loss of stockpiled topsoil and overburden material.	Natural and agricultural resources	Operational, Decommissioning/Closure/ Rehabilitation	Visually inspect mining area boundaries, exposed surfaces, overburden and top soil stockpiles for signs of erosion. If erosion channels are discovered the mine must determine the cause of erosion and implement erosion rectification and prevention measures to rehabilitate eroded areas and prevent future erosion. Rehabilitate and reinstate engineered constructed contours as soon as a phase is complete. Undertake mining activities only in identified and specifically demarcated areas as proposed Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the mining activity areas and surrounds; and any storm water runoff from the mining areas and topsoil and overburden storage areas.	Impact avoidance, if detected rectification and prevention.
Mine vehicles/machinery	Vehicles and machinery on the site will produce	Natural resources	Operational, Decommissioning/Closure/ Rehabilitation	Vehicles and machinery will be maintained to minimize emissions. A log book will be filled in to keep a record of all	The occupational exposure limit of CO is 50 parts per million for a 40 hour work week. It is highly unlikely

	tailpipe **emissions** leading to air pollution			maintenance problems encountered and mitigation measures implemented to resolve the problem. Vehicles and machinery emitting excessive emissions will be stopped immediately and not allowed to operate until the necessary repairs have been done.	whether this level will be reached in the general environment.
All activities associated with proposed mining	Mining activities can result in **increased sediment loads in water resources**	Natural and agricultural resources	Operational, Decommissioning/Closure/ Rehabilitation	Where no existing gravel roads exists as buffer areas an 8m buffer area as measured from the edge of the indigenous vegetation surrounding the non-perennial drainage lines on site must be demarcated and kept throughout mining operational phase. The proposed buffer areas may only be used as roads and no other activities associated with the proposed mining of the site may occur within the buffer areas. Demarcation method to be approved by an Environmental Control Officer (ECO). Minimize sediment load in the water by stripping a maximum of 10 meters ahead of the mining face and only moving the material once it needs to be processed or onto the intended topsoil stockpiles on the edge of all current and future mining areas. Monitor for erosion. Should erosion be present, undertake mitigation measures to rectify and prevent further	Impact avoidance, if detected rectification and prevention.

				erosion. All roads need to be maintained and monitored. Visible signs of possible erosion must be immediately rehabilitated. All storm water falling outside the mine property must be diverted around the mine. This forms part of the Storm Water Management Measures and part of the EMPr.	
All activities associated with proposed mining	Mining activities can **impact on adjacent water resources** i.e. secondary drainage lines and dams with associated wetland characteristics and aquatic vegetation as associated with mapped NFEPAs and aquatic CBAs and ESAs	Natural and agricultural resources	Operational, Decommissioning/Closure/ Rehabilitation	Undertake mining activities only in identified and specifically demarcated areas as proposed. Storm water and erosion control as per an Environmental Management Programme (EMP) must be conducted and monitored to prevent siltation of drainage line No disturbance should be allowed within the drainage line or wetland areas. This includes no dumping of fill, no roads, and all forms of temporary disturbance. No drainage line or wetland areas edges may be disturbed or impacted upon by the proposed activities. Where no existing gravel roads exists as buffer areas an 8m buffer area as measured from the edge of the indigenous vegetation surrounding the non-perennial drainage lines on site must be demarcated and kept throughout mining operational phase. The proposed buffer areas may only be used as roads	Impact avoidance, if detected rectification and prevention.

				and and for stormwater management no other activities associated with the proposed mining of the site may occur within the buffer areas. Demarcation method to be approved by an Environmental Control Officer (ECO). No mining activities may occur within 100m from any drainage line or wetland without determining requirement for water use authorisation from Department of Water and Sanitation or the Breede Gouritz Catchment Management Agency	
Excavations	The **trapping of storm water** within excavations on the mine area	Natural and agricultural resources	Operational, Decommissioning/Closure/ Rehabilitation	All storm water falling outside the mine property must be diverted around the mine. The mine will maintain the storm water diversion channels created along the perimeter of the mine property. The intention of the channels is to ensure water from outside the property is diverted around the quarry.	Impact avoidance, if detected rectification and prevention.
Chemical toilets and litter	**Pollution and nuisance due to leakage etc.**	Natural and agricultural resources	Operational, Decommissioning/Closure/ Rehabilitation	The toilets are serviced when needed and emptied when almost full. If a leak occurs the correct emergency procedure is to be followed (see EMP). Litter will be collected and removed from site by the operator on a daily basis.	Impact avoidance, if detected rectification and prevention.
Mine vehicles/machinery	**Ground and/or water pollution** and	Natural and agricultural resources	Operational, Decommissioning/Closure/ Rehabilitation	Any mine vehicle which is leaking hydrocarbons (e.g. petrol, diesel or oil) will be	Impact avoidance, if detected rectification and prevention.

	loss of natural and agricultural resources due to a **hydrocarbon spillage**			serviced in a concreted workshop to repair the leak. If it is not possible to repair the leak immediately, a drip tray will be placed under the leak to trap any spillages. The content of the drip trays will be decanted into an old oil drum for removal from the site to a hazardous waste handling facility. Hydrocarbon spillages are to be cleaned up immediately. The mine will also maintain a store of suitable absorbent material, suitable bioremediation substance and a spill kit. All incidences/ spillages are to be recorded in an incident log book. Contaminated soil must go to Vissershok Hazardous Landfill site.	
All activities associated with proposed mining	**Fire** can cause **habitat or crop destruction**	Natural and agricultural resources	Operational, Decommissioning/Closure/ Rehabilitation	All employees will be trained on fire safety and on how to reduce the probability of a fire spreading out of control. Anyone who observes a fire must report it immediately to the fire protection agency/ fire brigade and their supervisor/ mine manager. Vehicles must be parked in an area with no vegetation if a fire occurs	Impact avoidance, if detected rectification and prevention.
All activities associated with proposed mining	**Declared weeds may be transported onto the site** and spread to surrounding	Natural and agricultural resources	Operational, Decommissioning/Closure/ Rehabilitation	Alien invasive and weed vegetation monitoring and removal must be undertaken annually during mining and for at least a year after mining activities have ceased on	Impact avoidance, if detected rectification and prevention.

	areas. This may lead to **habitat destruction and increased management costs.**			disturbed areas or until the landowner starts with the annual cultivation activities on the affected land. This must be done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner. All invasive alien species as listed by the Conservation of Agricultural Resources Act (CARA) must be removed during these surveys. Declared weeds and aliens must be removed before annual seeding. Only use topsoil as derived and conserved from the proposed mining area to be rehabilitated after mining activities have ceased on the property	
All activities associated with proposed mining	**Natural fauna and avifauna habitat destruction**	Natural resources	Operational, Decommissioning/Closure/ Rehabilitation	Rehabilitate the area after mining process is complete and vegetation will return. Use of stockpiled topsoil to rehabilitate the site. Restrict mining activities only to demarcated approved mining areas.	Impact avoidance, if detected rectification and prevention.
All activities associated with proposed mining	Mining activities can **impact on indigenous vegetation remnants** associated with mapped	Natural resources	Operational, Decommissioning/Closure/ Rehabilitation	Where no existing gravel roads exists as buffer areas an 8m buffer area as measured from the edge of the indigenous vegetation surrounding the non-perennial drainage lines on site must be demarcated and kept throughout mining operational	Management of potential scale/size of impact.

	terrestrial CBAs, ESAs and buffer areas.			phase. The proposed buffer areas may only be used as roads and no other activities associated with the proposed mining of the site may occur within the buffer areas. Demarcation method to be approved by an Environmental Control Officer (ECO).No disturbance should be allowed within the drainage lines and remaining indigenous vegetation areas. This includes no dumping of fill, no roads, and all forms of temporary disturbance. Alien invasive and weed vegetation monitoring and removal must be undertaken annually during mining and for at least a year after mining activities have ceased on disturbed areas or until the landowner starts with the annual cultivation activities on the affected land. This must be done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner. All invasive alien species as listed by the Conservation of Agricultural Resources Act (CARA) must be removed during these surveys. Declared weeds and aliens must be removed before annual seeding.	

				Topsoil and overburden materials must be stored separately adjacent to the mining areas on cultivated land with effective storm water runoff and erosion prevention measures to be implemented in order to protect the materials for rehabilitation. Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the mining activity areas and surrounds; and any storm water runoff from the mining areas and topsoil and overburden storage areas. As the excavation of the quarry advances the stored overburden material must be replaced to backfill the excavations. The backfilled area must then be contoured according to existing surrounding contours of the cultivated land to prevent erosion. After contouring has been completed the stored topsoil material must be spread over the backfilled area. Only use topsoil as derived and conserved from the proposed mining area to be rehabilitated after mining activities have ceased on the property. The topsoil must not be compacted after spreading to allow the	

				disturbed area to be restored. The site must be monitored regularly (at least 6 monthly and after heavy rains) and all signs of erosion immediately rectified and alien vegetation removed to prevent potential siltation, erosion and alien encroachment of natural areas and drainage lines. •No disturbance should be allowed within the remaining indigenous vegetation areas. This includes no dumping of fill, no roads, and all forms of temporary disturbance. No natural vegetation areas edges may be cleared or impacted upon by the proposed mining activities The project implementation process should be subject to standard Environmental Management Programme (EMP) prescripts and conditions and only proceed under supervision of a competent and diligent Environmental Control Officer, both during the operational/excavation and rehabilitation phases.	
Loading, hauling and transport	**Increased traffic** due to the mining activities requiring various vehicles to come onto and	Socio Economic Impacts	Operational, Decommissioning/Closure/ Rehabilitation	A speed limit of 30km/hour will be displayed and enforced through a fining system. All vehicle drivers entering the site will be informed of the speed limit. Speed limit will be applicable when delivery trucks drive through areas where farm	Management of potential scale of impact.

	leave the site.			yard and housing is next to the road. The applicant will be responsible for upkeep and repair of farm roads used during mining activities to the satisfaction of the landowner.	
All activities associated with proposed mining	**Mining on agricultural land**	Socio Economic Impacts and agricultural resources impacts	Operational Phase	Compensate the landowner for the temporary loss of agricultural land during mining activities. Before any mining activities commence, soil fertility samples (in terms of agricultural potential) must be taken at each of the proposed mining areas, by a qualified person and samples must be tested at a certified laboratory. Samples should be taken from the surface to a depth of 25cm so as to include equal amounts of soil over the full depth range between 0 and 25cm. Topsoil and overburden materials must be stored separately adjacent to the mining areas with effective storm water runoff and erosion prevention measures to be implemented in order to protect the materials. Topsoil stockpiles should be protected against losses by water and wind erosion. The mining plan should be such that topsoil is stockpiled for the minimum possible time by rehabilitating different mining blocks progressively as the mining process continues.	Management of potential scale/size of impact.

				As the excavation of the quarry advances the stored overburden material must be replaced to backfill the excavations. The backfilled area must then be contoured according to existing surrounding contours of the cultivated land to prevent erosion. After contouring has been completed the stored topsoil material must be spread over the backfilled area. The topsoil must not be compacted after spreading to allow the disturbed area to be restored for agricultural use. The site must be monitored regularly (at least 6 monthly and after heavy rains) and all signs of erosion immediately rectified to prevent potential siltation and erosion of natural areas and drainage lines. Only use topsoil as derived and conserved from the proposed mining area to be rehabilitated after mining activities have ceased on the property. During rehabilitation, the stockpiled topsoil must be evenly spread over the mining surface. Topsoil spreading should be done just before the winter season so that a cover crop can be seeded and established during the winter rains and to control erosion on the newly spread topsoil. If topsoil is spread long before the winter, it	

				will be subject to wind erosion before vegetation can be established on it. To ensure minimum impact on drainage, it is important that no surface depressions are left after mining. In other words the surface slope must be maintained throughout, including through the edge of the mined area. Surface depressions will result in ponding of water on the surface and accumulation of excess moisture in depression areas. There is sufficient slope and elevation in the proposed mining area to avoid the creation of depressions, provided that mining depths are controlled to ensure the maintenance of a slope. No compaction in the soil should remain after rehabilitation. Compaction will impede water movement through the soil profile. The engineered constructed contours must be reinstated as soon as a phase is completed. If ripping is required to loosen compaction, this should be done to a depth of at least 30cm, and in such a way that no mixing of the subsoil into the topsoil layer occurs. A cover crop must be established immediately after spreading of topsoil and ripping, to stabilize the soil and protect it	

				from erosion. Any chemical ameliorants should be spread on the soil before loosening or ploughing or should be done as part of the farmer's planting program. Alien invasive and weed vegetation monitoring and removal must be undertaken annually during mining and for at least a year after mining activities have ceased on disturbed areas or until the landowner starts with the annual cultivation activities on the affected land. This must be done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner. All invasive alien species as listed by the Conservation of Agricultural Resources Act (CARA) must be removed during these surveys. Declared weeds and aliens must be removed before annual seeding. Double stripping. Double stripping is a rehabilitation technique that is recommended by the Chamber of Mines (2007). It involves stripping a layer of topsoil, and then a second additional layer below the topsoil.	

				Both of these layers are stockpiled separately and during rehabilitation are spread on the surface in their original sequence. In other words, the subsoil layer is spread immediately on top of the profiled overburden, and the topsoil layer is then spread on top of that. The topsoil layer should be stripped to approximately 30cm depth. Care must be taken by the stripping operator to strip as great a depth of topsoil as possible (up to a maximum of 30cm) without including any of the underlying clay layer as part of the topsoil. So where the clay layer occurs at a shallower depth than 30cm, the stripping must only occur to that shallower depth. The second subsoil stripping should be done to an additional depth of 30cm below the depth to which the subsoil was stripped. The double stripping ensures that the rehabilitated profile contains the original soil material to a depth of 60cm, and that none of the deeper underlying material, that is likely to be too saline to be part of the root zone, occurs within it. The crop that is sown on the first season of the rehabilitated soil should be a hardy, annual crop that is sown primarily for soil	

				stabilisation and biomass and not necessarily for production. It should be dosed with a high level of nitrogen fertilser in order to maximise vegetative growth and therefore biomass production (both above and below ground). This is likely to be a higher level of fertilisation than would be determined for economic viability in terms of input costs versus production. The increased fertilisation costs should therefore be borne by the mine's rehabilitation budget, and not by the farmer. Soil fertility samples (in terms of agricultural potential) must be taken at the restored areas similar to soil fertility samples that were taken before mining activities commenced. The fertility of the soil must at least be restored to the soil quality levels that were recorded before mining activities commenced. Samples should be taken in the same way as pre-mining samples to a depth of 25cm. Soil chemical deficiencies must be corrected, based on these samples. A chemical analysis from an agricultural laboratory will include a recommendation of the appropriate quantities of chemical ameliorants (for example lime, phosphate etc) that should be applied to	

				optimize the soil chemistry for the relevant crop. Any chemical ameliorants should be spread on the soil before loosening or ploughing or should be done as part of the farmer's planting program. When no evidence of erosion and alien vegetation encroachment are visible and similar soil quality levels are reached as before mining activities commenced the mined areas can be considered as successfully rehabilitated.	
Excavations	**Heritage Resources Impacts**	The potential impact of the proposed development on archaeological, paleontological and heritage remains	Operational Phase	Should any burials, fossils or other historical material be encountered during mining, work must cease immediately and HWC must be contacted.	Impact avoidance, if detected rectification and prevention.
All activities associated with proposed mining	**Noise impacts**	Noise due to mining machinery, trucks and people on site	Operational, Decommissioning/Closure/ Rehabilitation	No activities that may generate noise levels above the legal limit in terms of the Environmental Conservation Act, Western Cape Noise regulations will be conducted. Machinery and vehicles should be regularly maintained to prevent excessive noise. All machinery and work activities must adhere to the requirements of the noise regulations..	Noise monitoring if needed to ensure noise levels are below 45 dBA. Table 2 of SANS 10103:2004 *The measurement and rating of environmental noise with respect to land use, health, annoyance and to speech communication* where the daytime, equivalent continuous rating level is given as 45 dBA for Rural Districts.
All activities associated with proposed mining	**Visual impact**	A negative visual impact	Operational Phase	Proposed mining activities must be limited to development	Management of potential scale/size of impact.

		due to the creation of excavation pits.		footprint site. Rehabilitation of site when mining process complete.	
Decommissioning of mine	**Soil erosion**	Natural and agricultural resources	Decommissioning Phase	Mine area must be rehabilitated and pastures planted immediately after mine is completed. Engineered contour structures reinstated and maintained. Monitor rehabilitation of area on a 6 monthly basis until effective/successful rehabilitation has been obtained. If erosion is detected implement erosion rectification and preventions measures as guided by the EMPr and recommend by a ECO	Impact avoidance and prevention.
Decommissioning of mine	**Introduction of alien plant species** during rehabilitation.	Natural and agricultural resources	Decommissioning Phase	Alien invasive and weed vegetation monitoring and removal must be undertaken annually during mining and for at least a year after mining activities have ceased on disturbed areas or until the landowner starts with the annual cultivation activities on the affected land. This must be done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner. All invasive alien species as listed by the Conservation of Agricultural Resources Act (CARA) must be removed during these surveys.	Impact avoidance and prevention.

				Declared weeds and aliens must be removed before annual seeding Only use topsoil as derived and conserved proposed mining area to be rehabilitated after mining activities have ceased on the property.	
Decommissioning of mine	**Socio Economic impacts**	Loss of socio-economic benefits to the local communities of Heidelberg and Riversdale	Decommissioning Phase	Additional viable bentonite deposits must be sourced and authorised to ensure sustainability of the Cape Bentonite Mine operations.	Impact avoidance and prevention.

f) Impact Management Actions

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

ACTIVITY whether listed or not listed. **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)**.	**POTENTIAL IMPACT** **(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc….etc.…)**	**MITIGATION TYPE** **(modify, remedy, control, or stop) through** **(e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc.)** **E.g.** • **Modify through alternative method.** • **Control through noise control** • **Control through management and monitoring** **Remedy through rehabilitation..**	**TIME PERIOD FOR IMPLEMENTATION** Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-.. Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.	**COMPLIANCE WITH STANDARDS** (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)
Excavations, loading,	**Increased dust levels**	Reduce drop height of material	Throughout operational and	The National Dust Control

hauling, transport and roads		to a minimum. Area will be mined in phases to reduce the barren areas. Temporarily halt material handling in extreme windy conditions. Use non-potable water to dampen bare soil areas if required to mitigate windblown dust. A speed limit of 30km/hour will be displayed and enforced through a fining system. All vehicle drivers entering the site will be informed of the speed limit. Compile and Implement a dust monitoring programme before the commencement of mining activities on site	rehabilitation phases as and if required.	Regulations regulates. Dust fallout may not exceeds 1200 mg/m^2/day averaged over 30 days, measured in accordance with reference method ASTM D1739 (Standard Test Method for Collection and Measurement of Dustfall (Settleable Particulate Matter).
All activities associated with proposed mining	Mining activities (i.e. The site preparation and removal of topsoil) will cause a disturbance and this disturbance, unless carefully managed, could spread as a result thereof. **Soil erosion** can occur due to wind (wind erosion cause dust pollution); and due to overland storm water flow should rains fall during mining. Loss of stockpiled topsoil and overburden material.	Visually inspect mining area boundaries, exposed surfaces, overburden and top soil stockpiles for signs of erosion. If erosion channels are discovered the mine must determine the cause of erosion and implement erosion rectification and prevention measures to rehabilitate eroded areas and prevent future erosion. Rehabilitate and reinstate engineered constructed contours as soon as a phase is complete. Undertake mining activities only in identified and specifically demarcated areas	Throughout operational and rehabilitation phases as and if required.	Impact avoidance, if detected rectification and prevention.

		as proposed Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the mining activity areas and surrounds; and any storm water runoff from the mining areas and topsoil and overburden storage areas.		
Mine vehicles/machinery	Vehicles and machinery on the site will produce tailpipe **emissions** leading to air pollution	Vehicles and machinery will be maintained to minimize emissions. A log book will be filled in to keep a record of all maintenance problems encountered and mitigation measures implemented to resolve the problem. Vehicles and machinery emitting excessive emissions will be stopped immediately and not allowed to operate until the necessary repairs have been done.	Throughout operational and rehabilitation phases as and if required.	The occupational exposure limit of CO is 50 parts per million for a 40 hour work week. It is highly unlikely whether this level will be reached in the general environment.
All activities associated with proposed mining	Mining activities can result in **increased sediment loads in water resources**	Where no existing gravel roads exists as buffer areas an 8m buffer area as measured from the edge of the indigenous vegetation surrounding the non-perennial drainage lines on site must be demarcated and kept throughout mining operational phase. The proposed buffer areas may only be used as roads and no other activities associated with the proposed mining of the site	Throughout operational and rehabilitation phases.	Impact avoidance, if detected rectification and prevention.

		may occur within the buffer areas. Demarcation method to be approved by an Environmental Control Officer (ECO). Minimize sediment load in the water by stripping a maximum of 10 meters ahead of the mining face and only moving the material once it needs to be processed or onto the intended topsoil stockpiles on the edge of all current and future mining areas. Monitor for erosion. Should erosion be present, undertake mitigation measures to rectify and prevent further erosion. All roads need to be maintained and monitored. Visible signs of possible erosion must be immediately rehabilitated. All storm water falling outside the mine property must be diverted around the mine. This forms part of the Storm Water Management Measures and part of the EMPr.		
All activities associated with proposed mining	Mining activities can **impact on adjacent water resources** i.e. secondary drainage lines and dams with associated wetland characteristics and aquatic vegetation as associated with mapped NFEPAs and aquatic	Undertake mining activities only in identified and specifically demarcated areas as proposed. Storm water and erosion control as per an Environmental Management Programme (EMP) must be conducted and monitored to prevent siltation of drainage	Throughout operational and rehabilitation phases.	Impact avoidance, if detected rectification and prevention.

	CBAs and ESAs	line No disturbance should be allowed within the drainage line or wetland areas. This includes no dumping of fill, no roads, and all forms of temporary disturbance. No drainage line or wetland areas edges may be disturbed or impacted upon by the proposed activities. Where no existing gravel roads exists as buffer areas an 8m buffer area as measured from the edge of the indigenous vegetation surrounding the non-perennial drainage lines on site must be demarcated and kept throughout mining operational phase. The proposed buffer areas may only be used as roads and and for stormwater management no other activities associated with the proposed mining of the site may occur within the buffer areas. Demarcation method to be approved by an Environmental Control Officer (ECO). No mining activities may occur within 100m from any drainage line or wetland without determining requirement for water use authorisation from Department of Water and Sanitation or the Breede Gouritz Catchment Management Agency		

Excavations	The **trapping of storm water** within excavations on the mine area	All storm water falling outside the mine property must be diverted around the mine. The mine will maintain the storm water diversion channels created along the perimeter of the mine property. The intention of the channels is to ensure water from outside the property is diverted around the quarry.	During operational phase	Impact avoidance, if detected rectification and prevention.
Chemical toilets and litter	**Pollution and nuisance due to leakage etc.**	The toilets are serviced when needed and emptied when almost full. If a leak occurs the correct emergency procedure is to be followed (see EMP). Litter will be collected and removed from site by the operator on a daily basis.	During operational phase	Impact avoidance, if detected rectification and prevention.
Mine vehicles/machinery	**Ground and/or water pollution** and loss of natural and agricultural resources due to a **hydrocarbon spillage**	Any mine vehicle which is leaking hydrocarbons (e.g. petrol, diesel or oil) will be serviced in a concreted workshop to repair the leak. If it is not possible to repair the leak immediately, a drip tray will be placed under the leak to trap any spillages. The content of the drip trays will be decanted into an old oil drum for removal from the site to a hazardous waste handling facility. Hydrocarbon spillages are to be cleaned up immediately. The mine will also maintain a store of suitable absorbent material, suitable bioremediation substance and	Throughout operational and rehabilitation phases.	Impact avoidance, if detected rectification and prevention.

		a spill kit. All incidences/ spillages are to be recorded in an incident log book. Contaminated soil must go to Vissershok Hazardous Landfill site.		
All activities associated with proposed mining	**Fire** can cause **habitat or crop destruction**	All employees will be trained on fire safety and on how to reduce the probability of a fire spreading out of control. Anyone who observes a fire must report it immediately to the fire protection agency/ fire brigade and their supervisor/ mine manager. Vehicles must be parked in an area with no vegetation if a fire occurs.	Throughout operational and rehabilitation phases.	Impact avoidance, if detected rectification and prevention.
All activities associated with proposed mining	**Declared weeds may be transported onto the site** and spread to surrounding areas. This may lead to **habitat destruction and increased management costs.**	Alien invasive and weed vegetation monitoring and removal must be undertaken annually during mining and for at least a year after mining activities have ceased on disturbed areas or until the landowner starts with the annual cultivation activities on the affected land. This must be done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner. All invasive alien species as listed by the Conservation of Agricultural Resources Act (CARA) must be removed	Throughout operational and rehabilitation phases.	Impact avoidance, if detected rectification and prevention.

		during these surveys. Declared weeds and aliens must be removed before annual seeding. Only use topsoil as derived and conserved from the proposed mining area to be rehabilitated after mining activities have ceased on the property.		
All activities associated with proposed mining	**Natural fauna and avifauna habitat destruction**	Rehabilitate the area after mining process is complete and vegetation will return. Use of stockpiled topsoil to rehabilitate the site. Restrict mining activities only to demarcated approved mining areas.	Throughout operational and rehabilitation phases.	Impact avoidance, if detected rectification and prevention.
All activities associated with proposed mining	Mining activities can **impact on indigenous vegetation remnants** associated with mapped terrestrial CBAs, ESAs and buffer areas.	Where no existing gravel roads exists as buffer areas an 8m buffer area as measured from the edge of the indigenous vegetation surrounding the non-perennial drainage lines on site must be demarcated and kept throughout mining operational phase. The proposed buffer areas may only be used as roads and no other activities associated with the proposed mining of the site may occur within the buffer areas. Demarcation method to be approved by an Environmental Control Officer (ECO).No disturbance should be allowed within the drainage lines and remaining indigenous vegetation areas. This includes no dumping of fill, no roads,	Throughout operational and rehabilitation phases.	Management of potential scale/size of impact.

		and all forms of temporary disturbance. Alien invasive and weed vegetation monitoring and removal must be undertaken annually during mining and for at least a year after mining activities have ceased on disturbed areas or until the landowner starts with the annual cultivation activities on the affected land. This must be done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner. All invasive alien species as listed by the Conservation of Agricultural Resources Act (CARA) must be removed during these surveys. Declared weeds and aliens must be removed before annual seeding. Topsoil and overburden materials must be stored separately adjacent to the mining areas on cultivated land with effective storm water runoff and erosion prevention measures to be implemented in order to protect the materials for rehabilitation. Implement erosion and storm water runoff management measures as according to EMP		

		requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the mining activity areas and surrounds; and any storm water runoff from the mining areas and topsoil and overburden storage areas. As the excavation of the quarry advances the stored overburden material must be replaced to backfill the excavations. The backfilled area must then be contoured according to existing surrounding contours of the cultivated land to prevent erosion. After contouring has been completed the stored topsoil material must be spread over the backfilled area. Only use topsoil as derived and conserved from the proposed mining area to be rehabilitated after mining activities have ceased on the property. The topsoil must not be compacted after spreading to allow the disturbed area to be restored. The site must be monitored regularly (at least 6 monthly and after heavy rains) and all signs of erosion immediately rectified and alien vegetation removed to prevent potential siltation, erosion and alien encroachment of natural areas and drainage lines. •No disturbance should be		

		allowed within the remaining indigenous vegetation areas. This includes no dumping of fill, no roads, and all forms of temporary disturbance. No natural vegetation areas edges may be cleared or impacted upon by the proposed mining activities The project implementation process should be subject to standard Environmental Management Programme (EMP) prescripts and conditions and only proceed under supervision of a competent and diligent Environmental Control Officer, both during the operational/excavation and rehabilitation phases.		
Loading, hauling and transport	**Increased traffic** due to the mining activities requiring various vehicles to come onto and leave the site.	A speed limit of 30km/hour will be displayed and enforced through a fining system. All vehicle drivers entering the site will be informed of the speed limit. Speed limit will be applicable when delivery trucks drive through areas where farm yard and housing is next to the road. The applicant will be responsible for upkeep and repair of farm roads used during mining activities to the satisfaction of the landowner.	Throughout operational and rehabilitation phases.	Management of potential scale of impact.
All activities associated with proposed mining	**Mining on agricultural land**	Compensate the landowner for the temporary loss of agricultural land during mining	During operational phase	Management of potential scale of impact.

		activities. Before any mining activities commence, soil fertility samples (in terms of agricultural potential) must be taken at each of the proposed mining areas, by a qualified person and samples must be tested at a certified laboratory. Samples should be taken from the surface to a depth of 25cm so as to include equal amounts of soil over the full depth range between 0 and 25cm. Topsoil and overburden materials must be stored separately adjacent to the mining areas with effective storm water runoff and erosion prevention measures to be implemented in order to protect the materials. Topsoil stockpiles should be protected against losses by water and wind erosion. The mining plan should be such that topsoil is stockpiled for the minimum possible time by rehabilitating different mining blocks progressively as the mining process continues. As the excavation of the quarry advances the stored overburden material must be replaced to backfill the excavations. The backfilled area must then be contoured according to existing		

		surrounding contours of the cultivated land to prevent erosion. After contouring has been completed the stored topsoil material must be spread over the backfilled area. The topsoil must not be compacted after spreading to allow the disturbed area to be restored for agricultural use. The site must be monitored regularly (at least 6 monthly and after heavy rains) and all signs of erosion immediately rectified to prevent potential siltation and erosion of natural areas and drainage lines. Only use topsoil as derived and conserved from the proposed mining area to be rehabilitated after mining activities have ceased on the property. During rehabilitation, the stockpiled topsoil must be evenly spread over the mining surface. Topsoil spreading should be done just before the winter season so that a cover crop can be seeded and established during the winter rains and to control erosion on the newly spread topsoil. If topsoil is spread long before the winter, it will be subject to wind erosion before vegetation can be established on it. To ensure minimum impact on drainage, it is important that no		

		surface depressions are left after mining. In other words the surface slope must be maintained throughout, including through the edge of the mined area. Surface depressions will result in ponding of water on the surface and accumulation of excess moisture in depression areas. There is sufficient slope and elevation in the proposed mining area to avoid the creation of depressions, provided that mining depths are controlled to ensure the maintenance of a slope. No compaction in the soil should remain after rehabilitation. Compaction will impede water movement through the soil profile. The engineered constructed contours must be reinstated as soon as a phase is completed. If ripping is required to loosen compaction, this should be done to a depth of at least 30cm, and in such a way that no mixing of the subsoil into the topsoil layer occurs. A cover crop must be established immediately after spreading of topsoil and ripping, to stabilize the soil and protect it from erosion. Any chemical ameliorants should be spread on the soil before loosening or		

		ploughing or should be done as part of the farmer's planting program. Alien invasive and weed vegetation monitoring and removal must be undertaken annually during mining and for at least a year after mining activities have ceased on disturbed areas or until the landowner starts with the annual cultivation activities on the affected land. This must be done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner. All invasive alien species as listed by the Conservation of Agricultural Resources Act (CARA) must be removed during these surveys. Declared weeds and aliens must be removed before annual seeding. Double stripping. Double stripping is a rehabilitation technique that is recommended by the Chamber of Mines (2007). It involves stripping a layer of topsoil, and then a second additional layer below the topsoil. Both of these layers are stockpiled separately and		

		during rehabilitation are spread on the surface in their original sequence. In other words, the subsoil layer is spread immediately on top of the profiled overburden, and the topsoil layer is then spread on top of that. The topsoil layer should be stripped to approximately 30cm depth. Care must be taken by the stripping operator to strip as great a depth of topsoil as possible (up to a maximum of 30cm) without including any of the underlying clay layer as part of the topsoil. So where the clay layer occurs at a shallower depth than 30cm, the stripping must only occur to that shallower depth. The second subsoil stripping should be done to an additional depth of 30cm below the depth to which the subsoil was stripped. The double stripping ensures that the rehabilitated profile contains the original soil material to a depth of 60cm, and that none of the deeper underlying material, that is likely to be too saline to be part of the root zone, occurs within it. The crop that is sown on the first season of the rehabilitated soil should be a hardy, annual crop that is sown primarily for		

		soil stabilisation and biomass and not necessarily for production. It should be dosed with a high level of nitrogen fertilser in order to maximise vegetative growth and therefore biomass production (both above and below ground). This is likely to be a higher level of fertilisation than would be determined for economic viability in terms of input costs versus production. The increased fertilisation costs should therefore be borne by the mine's rehabilitation budget, and not by the farmer. Soil fertility samples (in terms of agricultural potential) must be taken at the restored areas similar to soil fertility samples that were taken before mining activities commenced. The fertility of the soil must at least be restored to the soil quality levels that were recorded before mining activities commenced. Samples should be taken in the same way as pre-mining samples to a depth of 25cm. Soil chemical deficiencies must be corrected, based on these samples. A chemical analysis from an agricultural laboratory will include a recommendation of the appropriate quantities of chemical ameliorants (for		

		example lime, phosphate etc) that should be applied to optimize the soil chemistry for the relevant crop. Any chemical ameliorants should be spread on the soil before loosening or ploughing or should be done as part of the farmer's planting program. When no evidence of erosion and alien vegetation encroachment are visible and similar soil quality levels are reached as before mining activities commenced the mined areas can be considered as successfully rehabilitated.		
Excavations	**Heritage Resources Impacts**	Should any burials, fossils or other historical material be encountered during mining, work must cease immediately and HWC must be contacted.	During operational phase	Impact avoidance, if detected rectification and prevention.
All activities associated with proposed mining	**Noise impacts**	No activities that may generate noise levels above the legal limit in terms of the Environmental Conservation Act, Western Cape Noise regulations will be conducted. Machinery and vehicles should be regularly maintained to prevent excessive noise. All machinery and work activities must adhere to the requirements of the noise regulations.	Throughout operational and rehabilitation phases.	Noise monitoring if needed to ensure noise levels are below 45 dBA. Table 2 of SANS 10103:2004 *The measurement and rating of environmental noise with respect to land use, health, annoyance and to speech communication* where the daytime, equivalent continuous rating level is given as 45 dBA for Rural Districts.
All activities associated with proposed mining	**Visual impact**	Proposed mining activities must be limited to development footprint site.	Throughout operational and rehabilitation phases.	Management of potential scale/size of impact.

		Rehabilitation of site when mining process complete.		
Decommissioning of mine	**Soil erosion**	Mine area must be rehabilitated and pastures planted immediately after mine is completed. Engineered contour structures reinstated and maintained. Monitor rehabilitation of area on a 6 monthly basis until effective/successful rehabilitation has been obtained. If erosion is detected implement erosion rectification and preventions measures as guided by the EMPr and recommend by a ECO	Decommissioning phase	Impact avoidance, if detected rectification and prevention.
Decommissioning of mine	**Introduction of alien plant species** during rehabilitation.	Alien invasive and weed vegetation monitoring and removal must be undertaken annually during mining and for at least a year after mining activities have ceased on disturbed areas or until the landowner starts with the annual cultivation activities on the affected land. This must be done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner. All invasive alien species as listed by the Conservation of Agricultural Resources Act (CARA) must be removed	Decommissioning phase	Impact avoidance, if detected rectification and prevention.

		during these surveys. Declared weeds and aliens must be removed before annual seeding Only use topsoil as derived and conserved proposed mining area to be rehabilitated after mining activities have ceased on the property.		
Decommissioning of mine	**Loss of socio-economic benefits/jobs** to the local communities of Heidelberg and Riversdale	Additional viable bentonite deposits must be sourced and authorised to ensure sustainability of the Cape Bentonite Mine operations.	Before there are no more bentonite deposits that has been authorised to be mined.	Impact avoidance and prevention.

i) Financial Provision

(1) Determination of the amount of Financial Provision.

(a) Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under the Regulation.

Main closure/rehabilitation objectives are to rehabilitate the 80ha proposed mining activities area on transformed cultivated agricultural land to previous agricultural potential/state.

If during the mining activities any indigenous vegetation areas or associated watercourse areas within the No-Go Areas are impacted upon by the mining activities these areas must be rehabilitated immediately and prevention measures must be put in place to prevent re-occurrence. Depending on the extent and type of impacts that occurred a qualified Environmental Control Officer must recommend and supervise rehabilitation measures that must be implemented. A suitable specialist must also be appointed to assess the impact/s on the affected environment within the No-Go area and provide suitable rehabilitation measures to be implemented. The ECO must consult with the specialist when determining rehabilitation and prevention measures that must be implemented. Only vegetation indigenous to the applicable area and suitable for the specific impacted site must be used for rehabilitation of any impacted indigenous vegetation areas. After rehabilitation measures have been implemented the specialist must inspect the rehabilitated areas and if successful provide written confirmation to the ECO that all impacted indigenous vegetation areas and/or associated watercourse areas within the No-Go Areas have been successfully rehabilitated, or if not successful must provide further rehabilitation recommendations which must be implemented. The mining company will be responsible for the rehabilitation on these areas until written confirmation has been obtained from the specialist that the impacted sites have been successfully rehabilitated. Specialist rehabilitation progress reports and/or written confirmation of successful rehabilitation must be appended to the ECO inspection reports to be submitted to the competent authority with the annual environmental compliance audit reports.

Before any mining activities commence, soil fertility samples (in terms of agricultural potential) must be taken at each of the proposed mining areas, by a qualified person and samples must be tested at a certified laboratory. Samples should be taken from the surface to a depth of 25cm so as to include equal amounts of soil over the full depth range between 0 and 25cm.

Topsoil and overburden materials must be stored separately adjacent to the mining areas with effective storm water runoff and erosion prevention measures to be implemented in order to protect the materials. Topsoil stockpiles should be protected against losses by water and wind erosion. The mining plan should be such that topsoil is stockpiled for the minimum possible time by rehabilitating different mining blocks progressively as the mining process continues.

As the excavation of the quarry advances the stored overburden material must be replaced to backfill the excavations. The backfilled area must then be contoured according to existing surrounding contours of the cultivated land to prevent erosion. After contouring has been completed the stored topsoil material must be spread over the backfilled area. The topsoil must not be compacted after spreading to allow the disturbed area to be restored for agricultural use. The site must be monitored regularly (at least 6 monthly and after heavy rains) and all signs of erosion immediately rectified to prevent potential siltation and erosion of natural areas and drainage lines. Only use topsoil as derived and conserved from the proposed mining area to be rehabilitated after mining activities have ceased on the property.

During rehabilitation, the stockpiled topsoil must be evenly spread over the mining surface. Topsoil spreading should be done just before the winter season so that a cover crop can be seeded and established during the winter rains and to control erosion on the newly spread topsoil. If topsoil is spread long before the winter, it will be subject to wind erosion before vegetation can be established on it.

To ensure minimum impact on drainage, it is important that no surface depressions are left after mining. In other words the surface slope must be maintained throughout, including through the edge of the mined area. Surface depressions will result in ponding of water on the surface and accumulation of excess moisture in depression areas. There is sufficient slope and elevation in the proposed mining area to avoid the creation of depressions, provided that mining depths are controlled to ensure the maintenance of a slope. No compaction in the soil should remain after rehabilitation. Compaction will impede water movement through the soil profile. The engineered constructed contours must be reinstated as soon as a phase is completed.

If ripping is required to loosen compaction, this should be done to a depth of at least 30cm, and in such a way that no mixing of the subsoil into the topsoil layer occurs. A cover crop must be established immediately after spreading of topsoil and ripping, to stabilize the soil and protect it from erosion. Any chemical ameliorants should be spread on the soil before loosening or ploughing or should be done as part of the farmer's planting program.

Alien invasive and weed vegetation monitoring and removal must be undertaken annually during mining and for at least a year after mining activities have ceased on disturbed areas or until the landowner starts with the annual cultivation activities on the affected land. This must be done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner. All invasive alien species as listed by the Conservation of Agricultural Resources Act (CARA) must be removed during these surveys. Declared weeds and aliens must be removed before annual seeding.

Double stripping. Double stripping is a rehabilitation technique that is recommended by the Chamber of Mines (2007). It involves stripping a layer of topsoil, and then a second additional layer below the topsoil. Both of these layers are stockpiled separately and during rehabilitation are spread on the surface in their original sequence. In other words, the subsoil layer is spread immediately on top of the profiled overburden, and the topsoil layer is then spread on top of that. The topsoil layer should be stripped to approximately 30cm depth. Care must be taken by the stripping operator to strip as great a depth of topsoil as possible (up to a maximum of 30cm) without including any of the underlying clay layer as part of the topsoil. So where the clay layer occurs at a shallower depth than 30cm, the stripping must only occur to that shallower depth. The second subsoil stripping should be done to an additional depth of 30cm below the depth to which the subsoil was stripped. The double stripping ensures that the rehabilitated profile contains the original soil material to a depth of 60cm, and that none of the deeper underlying material, that is likely to be too saline to be part of the root zone, occurs within it.

The crop that is sown on the first season of the rehabilitated soil should be a hardy, annual crop that is sown primarily for soil stabilisation and biomass and not necessarily for production. It should be dosed with a high level of nitrogen fertilser in order to maximise vegetative growth and therefore biomass production (both above and below ground). This is likely to be a higher level of fertilisation than would be determined for economic viability in terms of input costs versus production. The increased fertilisation costs should therefore be borne by the mine's rehabilitation budget, and not by the farmer.

Soil fertility samples (in terms of agricultural potential) must be taken at the restored areas similar to soil fertility samples that were taken before mining activities commenced. The fertility of the soil must at least be restored to the soil quality levels that were recorded before mining activities commenced. Samples should be taken in the same way as pre-mining samples to a depth of 25cm. Soil chemical deficiencies must be corrected, based on these samples. A chemical analysis from an agricultural laboratory will include a recommendation of the appropriate quantities of chemical ameliorants (for example lime, phosphate etc) that should be applied to optimize the soil chemistry for the relevant crop. Any chemical ameliorants should be spread on the soil before loosening or ploughing or should be done as part of the farmer's planting program.

When no evidence of erosion and alien vegetation encroachment are visible and similar soil quality levels are reached as before mining activities commenced the mined areas can be considered as successfully rehabilitated.

The mine permit/right holder commits to post-closure maintenance during rehabilitation of the site until the time of receipt of a closure certificate for all or parts of the impacted mining areas, accept for the areas which the landowner plants crops after rehabilitation. In other words once the landowner plants the first crops on the rehabilitated areas the landowner takes further responsibility for impact maintenance of the cultivated areas.

Also refer to Closure/Rehabilitation Plan under **Appendix F** of the Scoping Report**.**

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

The environmental objectives in relation to the closure of the mine are included in the documents that have been submitted to the registered interested and affective parties for comment.

(c) 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.

Refer to Appendix B of the Draft Scoping Report for maps of proposed mining area to be rehabilitated after mining has been completed. Cape Bentonite Mine will be responsible for rehabilitating the mined area as according to the recommendations of the EMP. Refer to 1(a) above for rehabilitation measures to be implemented during the operational, closure and rehabilitation phase.

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

The proposed rehabilitation measures/plan has been informed by the environmental impact assessment conducted; Potential impacts with associated mitigation measures were identified for each phase of the proposed mining activities i.e. operational and closure/decommissioning/rehabilitation phases.

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

At a rate of R 213 184/ha, the estimate global cost for the rehabilitation of the proposed active quarries of 16.84ha will be R 3 590 018.50.

Total Proposed Rehabilitation Financial Provision for the Mining Right = R 3 590 018.50

Take note: The above mentioned proposed rehabilitation cost is only an estimate, in terms of section 1 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) a holder "*in relation to a prospecting right, **mining right**, mining permit, retention permit, exploration right, production right, reconnaissance permit or technical co-operation permit, means the person to whom such right or permit has been granted or such person's successor in title.*" Therefore the holder of the mining right will remain financially responsible for implementing rehabilitation measures until the set rehabilitation objectives have been met no matter the final costs.

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

By signing this document the EAP hereby confirms that the applicant stated that the financial provision will be provided as determined.

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

g) Monitoring of Impact Management Actions
h) Monitoring and reporting frequency
i) Responsible persons
j) Time period for implementing impact management actions
k) Mechanism for monitoring compliance

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Mining: Operation phase	Impacts on soil, air, water resources, adjacent drainage lines, indigenous vegetation and agricultural land	Conduct regular internal audits and inspections of the mining operation and assess against mine right, Environmental Authorization and EMPr conditions. Yearly audits and mine performance assessment reports	Applicant and Environmental Control Officer	Monitoring should be undertaken for duration of operations and after completion of each phase. Internal audits and inspections should be undertaken at least monthly. External audits by a qualified ECO should be undertaken on a 3 monthly basis during operation and 6 monthly during rehabilitation phase until successful rehabilitation has been achieved. Reports should be made available to the Competent Authority if required in the form of an annual performance report.
Mining: Closure and rehabilitation phase	Successful rehabilitation of impacted area	Conduct regular internal audits and inspections of the mining operation and assess against mine right, Environmental Authorization and EMPr conditions. Yearly audits and mine performance assessment reports	Applicant and Environmental Control Officer	Monitoring should be undertaken for duration of operations and after completion of each phase. Internal audits and inspections should be undertaken at least monthly. External audits by a qualified ECO should be undertaken on a 3 monthly basis during operation and 6 monthly

				during rehabilitation phase until successful rehabilitation has been achieved. Reports should be made available to the Competent Authority if required in the form of an annual performance report.

l) Indicate the frequency of the submission of the performance assessment/ environmental audit report.

External audits and annual performance report should be undertaken by a suitably qualified auditor on an annual basis once mining operations has commenced. Reports should be made available to the Competent Authority if required.

m) Environmental Awareness Plan

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

Mine staff member will be informed of the potential environmental risks associated with their work by implementing environmental awareness training through the following methods:

- Monthly meetings
- Environmental Management Program Training (bi-annually)
- Induction courses
- Training from the Environmental Control Officer (once a year)

The Environmental Awareness Plan should be reviewed regularly to ensure that relevant environmental concerns are discussed and that the potential impacts of such concerns are minimized. The syllabus to be taught to staff members has been determined through identification of the major environmental concerns raised in the Environmental Impact Assessment.

Monthly meetings:

Monthly meetings are ideal to facilitate awareness of job-specific environmental dangers and to educate employees on how they can live a more sustainable lifestyle outside work. The method and medium of communication during the monthly meetings will be determined by the team leader facilitating the meetings. The topics discussed in monthly meetings will be recorded in a logbook, with all employees present signing an attendance register.

The team leader who is to undertake the monthly meetings will be provided with the necessary training so that he can effectively inform the other employees about the topics listed below.

The topics for discussion have been identified as both topics specific to the mine but also topics that the employees can take home and use in their personnel lives:

Any notes or minutes of the meeting or other records of the meeting should be made available to all staff members at all time for perusal and for future reference purposes.

In addition to the monthly meeting, environmental topics will be discussed at a special meeting to be held if an environmental incident occurred during the previous day. Such incidents may include a fuel spill or a complaint from a surrounding landowner/ resident.

During these meetings, the following topics will be discussed:

- How the incident occurred;
- Why the incident occurred;
- How the incident was dealt with (if applicable);
- Evaluation of the response undertaken by the employees;
- Can the response be improved;
- What preventative measures should be implemented; and
- What can be done to reduce the probability of the incident recurring

The incident and the outcomes of the discussion will be noted in an incident logbook and mitigatory measures will be implemented by the employees and mine manager as required.

Environmental Management Program Training
Twice a year, aspects of the EMP will be selected to form part of a half days training workshop. Mine employees will attend the training workshop based on the topics selected and environmental incidents that may have occurred during the previous few months. Examples of topics that may be included in the EMP training include:

- Clean up of oil spills;
- Water conservation;
- The importance of alien vegetation removal;
- Concurrent rehabilitation;
- Training on fire hazards;
- Crime and Trespassing;
- Identifying and preventing soil erosion, etc.

After attending the EMP training program the employees will be required to sign a register as proof of training.

Induction Training
All new employees will undergo an induction course when they are appointed by the mine. Environmental awareness forms part of this induction course. The following syllabus of environmental training is to be included within the induction course.

Syllabus of environmental Training:

Sustainability
Discuss the concepts of sustainability, which must include:

- Definition of sustainable development.
- An explanation of the "Triple Bottom Line" of a sustainable development.
- An example of sustainable developments. These should be selected based on the audience, selecting a development that they can relate to.

Environmental Goals and Objectives
Discuss the latest specific environmental goals and objectives, as well as the benefits of achieving such goals. As these goals change, the induction course must be updated accordingly. Where possible, the goals and objectives covered should be selected on the basis of topics that personnel can relate to. These could include, but are not limited to the following:

Concurrent rehabilitation
Goal: Rehabilitate mined out areas concurrently.
Objective: To ensure that all mine out areas are concurrently rehabilitated.
Benefits: Reduce the cost of final rehabilitation.

Reduce the time to implement final rehabilitation. Reduce the time to obtain a closure certificate. Improve the ecological status of the site. The more surfaces rehabilitated the less chance of erosion and dust from exposed surfaces. To increase the aesthetical appeal of the mining site.

Waste minimization
Goal: Reduce waste generation and recycle where possible.
Objective: Initiate recycling projects where possible.

Benefits: Reduction of waste and promotion of recycling reduces the economic and environmental costs of dealing with waste. Recycling reduces the need to use non-renewable resources, ensuring that these will be available to future generations.

Reducing amounts of hydrocarbon spillages

Goal: Reduce the amount of hydrocarbon spillages and the impact from spillages that do occur.

Objective: To reduce probability of hydrocarbon spillages.

Benefits: Saving of oil reduces the need to use non-renewable resources. Reduce the potential for soil contamination. Reduce the potential to pollute the ground water.

Also allow time for questions

After attending the induction training, the employees will be required to sign a register as proof of training.

Environmental Training from the Environmental Control Officer

Every year, a qualified environmental consultant will be employed to undertake an environmental performance assessment of the mine. As part of the terms of reference to the consultant, it will be made a requirement that after the consultant has finished the activities required for the audit the consultant will inform all the employees of his/ her findings and provide practical tips of reducing some of the environmental impacts noted. The employees will be required to sign a register as proof of training.

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

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

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

No specific information requirements have been detailed by the Competent Authority to date. It is confirmed that the financial provisions will be reviewed annually.

o) Site Specific Storm water Management Measures to be implemented during Proposed Mining Activities

Refer to Storm water Management Plan attached as **Appendix G2** and where applicable the Best Practice Guideline: Storm Water Management, 2006 for water resource protection in the South African Mining Industry published by the Department of Water Affairs attached as **Appendix G3** to be adhered to.

p) General Environmental Management Guidelines to be implemented during the Proposed Mining Activities

Environmental Control Officer:

The mine must appoint or designate a suitable, experienced and qualified ECO before commencement of any land clearing or excavation activities to ensure compliance with the provisions of this EMP.

The ECO appointment contract must:

- Describe the level and type of competency required of the ECO ;
- Define and allocate the roles and responsibilities of the ECO.

- Indicate frequency of ECO site visits;

Site Meeting and Pre-conditions before Mining Activities Commence
The following pre-conditions must be fully met before any mining activities may commence:

- A site meeting between the mine manager and the ECO must take place at least 5 days prior to commencement of mining activities to:
    - Demarcate mining areas, services routes, stockpile areas, access, working boundaries and no-go areas;
    - Discuss methods and places for/of stockpiling;
    - Check required toilets and fire-fighting facilities to be in place;
    - Discuss and agree communication channels including provision of contact details;
    - Discuss and agree areas of responsibility;
    - Discuss and agree the demarcation and control of mining areas.
    - Discuss and implement adherence to site specific specialist recommendations.

Minutes of this formal site meeting must be kept, and are to be distributed to all parties.

The following equipment must be on site before any mining work is due to start:
- Sufficient and suitable chemical toilet facilities.
- Sufficient refuse bins, which are weather and wind proof, with proper lids.
- Adequate quantity of type ABC (all purpose) 12.5 kg fire extinguishers

Security and Safety:
Access to the mining site must be controlled. Telephone numbers of emergency services, including the local firefighting services, must be posted conspicuously at the mining site or at the entrance to the property. No firearms are permitted on the site, other than those authorised by the developer for the property security service provider. Notices should be displayed at all public entrances to the property, warning visitors that they are entering a mining site. Signboards to inform road users of the existing mining site must also be displayed on the property to warn any pedestrians or road users of the mining activities taking place on site.

Public Complaints:
A complaints register must be kept on site specifying the date, time, nature of complaint, details of the complainant and the responses undertaken to address and resolve problems raised.

Speed Limit:
For security and safety reasons the speed limit on the property for all mining vehicles is 30km per hour. The mine operator is responsible for ensuring that all his employees, mine operators and delivery vehicles adhere to this rule.

Livestock Grazing:
During mining operations on a particular site no livestock grazing is allowed within the agricultural land that is being mined until mining activities have ceased and the site has been rehabilitated to its former agricultural status quo.

Demarcation and Fencing:
No-go areas along the edge of the proposed mining area must be clearly demarcated to restrict access/egress across such demarcated lines and minimise environmental impact. The ECO must indicate each boundary and/or access route to be demarcated and

demarcation methods to be used before excavation commences and mining personnel will not be allowed beyond the perimeter of the site. All activities including stockpiling must occur within this demarcated area. The mine operator responsible must fund reinstatement or rehabilitation of damaged areas and features.

Physical demarcation of mining boundaries along no-go area should at the very least be via colour coded posts at least 1,5m high. Relatively small areas can be fenced with wooden or metal post at 3m centres with 1 plain wire strand tensioned horizontally at 900mm from ground level. Commercially available danger tape may also be wrapped around the wire strand. For large areas, like fairways, these posts are to be at 15m centres with 5 equidistant easily visible lime spot markings in between.

The onus here will fall on the mining staff to ensure all respect these no-go lines. Failure to ensure discipline will lead to the immediate erection of more physically challenging structures.

The mine operator must take measures to control the corrosive effects of storm-water runoff particularly in the hoarded-off areas. No run-off oil, fuel, sewage, or any other hazardous material is to be permitted, or allowed to enter the storm-water system or natural areas.

In the event that sensitive features are threatened by mining activities, the temporary fencing off of these areas or the mining areas might be required and this must be determined and recommended by the ECO.

No additional access routes may be created during the proposed mining activities and existing access routes may also not be widened.

Indigenous Fauna and Flora:
Indigenous plants or wild animals including reptiles, amphibians, birds, etc. may not be damaged or harmed or interfered with. Trapping, poisoning and/or killing of animals is specifically and strictly forbidden.

Exotic Plants:
Alien invasive and weed vegetation monitoring and removal must be undertaken annually during mining and for at least a year after mining activities have ceased on disturbed areas or until the landowner starts with the annual cultivation activities on the affected land. This must be done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner. All invasive alien species as listed by the Conservation of Agricultural Resources Act (CARA) must be removed during these surveys. Declared weeds and aliens must be removed before annual seeding.

Only use topsoil as derived and conserved from the proposed mining area to be rehabilitated after mining activities have ceased on the property

Water and Soil Management:
No activities, including swimming, washing, recreation, ablution, vehicle-washing, etc. will be permitted in any of the watercourses and/or the wetlands. Water is to be protected and conserved at all times. No watercourse may be polluted or affected by the mining activities. No surface or groundwater may be polluted due to any activity on the property/site

Archaeology and Palaeontology Management:
Should any heritage or fossil remains be exposed during any excavation or related activities, these must immediately be reported to the Provincial Heritage Resource Authority of the

Western Cape, Heritage Western Cape (in terms of the National Heritage Resources Act, 1999 (Act No.25 of 1999). Heritage remains uncovered or disturbed during excavations must not be disturbed until inspection and verified by the professional.

Fuel, Lubricant and Hazardous Material Handling Programme:
Servicing and refuelling of vehicles and machinery to take place at the mining plant and not on site. All vehicles must be in a good condition with no leakages leading to possible contamination of soil or water supplies.

If present on site all potentially hazardous chemicals and fuel should be stored in bunded areas which are clearly marked. The bunded areas must have a volume of 110% above that of the stored volume.

Mitigation measures must be put in place to avoid any hazardous material spillages, any spillage must be contained and immediately reported to the Departments Directorate: Pollution Management.

Hazardous spill reaction procedure:
Confine the Spill -
• Remove leaking container/vehicle from the site to a bunded area and repair leak immediately.
• Reduce flow from punctured area and seal the leak, by using the plug putty (Provided that the hole/tear is not larger than 5cm in width).

Clean Up a spill -
• Confine spillage to smallest possible area
• Collect spill control kits and absorb the spillage by spreading the absorbent granules over the affected area.
• Shut off critical equipment and utilities.
• Attempt to de-contaminate or clean up the spill
• Place the soaked granules or contaminated soil into plastic bags and dispose with hazardous waste.
• Assess need for outside spill contractor to assist.
• Notify site manager of the need for or outside spill contractor and of the nature and location of the spill.

Within 24hours of spill detection the ECO must be informed of the incident, where after ECO will conduct a site visit and recommend further remediation and/or rehabilitation methods to be implemented. Depending on type and extent of emergency that occurred specialists may be contacted to provide specific recommendations and an incident report might need to be completed and sent to municipal and governmental authorities

On completion of the cleanup operations, ECO to inspect site and announce "All Clear".

On-Site emergency repairs:
Only small mobile plant and emergency repairs are to take place on site. These will require the provision of drip trays and funnels to ensure that no oil or fuel leakages occur onto the ground. Should such spill take place, then the oil saturated soil is to be placed in suitable containers and disposed of at a hazardous waste disposal site. Any contamination of soil is to be treated with Spillsolve or similar product. Contaminated water as a result of an oil or fuel spillage on the area should similarly be treated in appropriate way, and the polluted water should not be specifically removed and not allowed to merge with run-off water collected in the trap collecting all run offs from the slab.

Collection of contaminated spares and waste oils and greases:
Contaminated spares, oil filters, gaskets, water, waste oils and fuel etc. must be stored in separate impermeable waste containers to be transported to or collected by a registered and reputed mine operator for disposal at a licensed hazardous waste disposal facility.

Staff will require instruction in:

- Deleterious effects of oil / fuel on the environment
- Identification of oil leaks
- Handling of oil / fuel leaks into soil
- Location and method in storage of contaminated spares
- Fire prevention and emergency drills in case of an accident

Roads:
Existing access roads must be used during mining work. The mine operator must ensure that access to mining sites and associated infrastructure and equipment is clearly defined and designated to be off-limits to the public at all times during mining.

Traffic safety measures must be considered and implemented in determining entry or exit points to public roads. Mud and sand deposited onto public roads by mining activities must be cleared regularly. Appropriate traffic warning signs must be maintained.

The applicant will be responsible for upkeep and repair of farm roads used during mining activities to the satisfaction of the landowner.

Dust and Noise Control:
The mine operator is to take appropriate measures to minimise the generation of dust as a result of mining works, to the satisfaction of the landowner. Vegetation must be stripped from demarcated mining sites only shortly before commencing with the mining process. On sandy or very dusty sites, mulched vegetation, which is to be obtained from area cleared for mining and is suitable, can be used as a method of stabilisation and dust control. Anchovy net can further be used as a method of stabilising dust control on mining sites or stockpiled sites, especially on sites where no current mining equipment is working. Seed bearing material with invasive vegetation must not be used for stabilization purposes.

During high velocity wind conditions, the mine operator or his representative is to evaluate the situation and make recommendations as to whether dust suppression measures are adequate, or whether to suspend work until wind speeds drop to an acceptable level.

The use of potable water for dust suppression is discouraged and alternative sources of water should be considered and discussed with the landowner if required.

Where possible, all haulage vehicles exiting the site must be suitably covered when transporting materials to minimise the impact of windblown dust.

Compile and Implement a dust monitoring programme before the commencement of mining activities on site

Mining noise levels must not pose a nuisance to the surrounding communities and all mining working hours must be limited to normal working hours weekday 8h00 – 17h00 unless arranged with municipality and landowner. All machinery and mining vehicles must be serviced regularly and be in a good working condition to prevent excessive noise generation.

Anti-erosion Measures:
The mine operator must take all appropriate and active measures to prevent erosion, especially wind and water erosion, resulting from operations and activities, specifically inclusive of storm water control measures, to the satisfaction of the ECO.

During mining the mine operator must protect areas susceptible to wind and water erosion, by installing all the necessary temporary and permanent works. Measures can include brush packing, anchovy net stabilisation, etc. Runoff from the site will be reduced to not exceed pre-development runoff by using detention facilities in critical places. Where required erosion protection measures must be installed.

Top Soil and Material Removal & Stockpiling:
A minimum of 100 mm topsoil must be removed from demarcated mining sites and separately stockpiled (within the demarcated working area or on designated areas). Topsoil stockpiles must be convex berms of 2m wide and should not exceed 1.5 metre in height, and if required be covered by anchovy net as necessary to prevent wind erosion. Topsoil must not be compacted in any way, especially by vehicles riding over it. Surplus sub-soil that becomes available during mining work must be used as fill material.

Appropriate use of Machinery:
The mine operator must at all times carefully consider what machinery is appropriate to the task to minimise the extent of environmental damage. No machinery is to operate outside of any demarcated working area. Overloading of vehicles carrying minerals must not be allowed. Operators of machinery must be suitably qualified.

Eating, Washing and Resting Areas:
The mine operator must designate restricted places for personnel to eat, wash and rest, within the specified working areas. The mine operator must provide adequate weather proof refuse bins. The feeding of, or leaving food for, animals is strictly prohibited. No persons will be permitted to live on site. Only employed security personnel will be allowed to overnight on site.

The mine operator is responsible for the provision of sufficient and suitably placed chemical toilets. Toilets must be of a neat mining and must be provided with doors and locks and must be secure to prevent wind damage. The mine operator must ensure that toilets are serviced and emptied when required. Waste must be disposed of at a registered waste disposal site. Sanitation provision and servicing must be to the satisfaction of the landowner.

Cleaning of vehicles / equipment:
Washing of mining vehicles and equipment will only be allowed at the mining plant in bunded areas.

Waste Disposal in terms of Integrated Waste Management:
The mine operator will be expected to keep his mining site neat and tidy and free of litter at all times. No on-site burying or dumping of any waste materials, vegetation, litter or refuse must be allowed. The mine operator must ensure that waste and surplus food, food packaging and organic waste are not disposed of by any workers anywhere on the site except in the provided removable refuse bins.

Refuse bins must be weather and animal proof. Bins must not be allowed to become overfull and must be emptied on a frequent basis by the mine operator. The mine operator must transport refuse collected from the working areas on site to a suitable waste site when required.

Refuse is deemed to include all discarded mining materials such as wire, nails, tins, and cans, drums, piping, plastic straps, bricks, waste cement or concrete, cement bags, etc. The mine operator must make adequate provision for the removal of mining rubble and other excess material. No material or mining rubble may be spoiled on the property.

Hazardous and general waste should be stored in separate containers. Schedule 3 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) defines and identifies categories and waste types and should be consulted to determine which wastes types are classified as hazardous waste.

All hazardous waste must be stored in a secured and demarcated area and disposed of using a registered waste disposal operator.

Waste minimisation should be implemented such as the avoidance, reduction and re-use of waste during mining, before considering the disposal of such waste Any solid waste that is not being recycled must be disposed of at a licenced landfill. Recyclable general waste, building rubble and plant materials must be stored separately at mining site office and diverted from landfill facilities as far as possible. Plant materials can be sent for chipping or for composting.

The applicant must obtain and file disposal certificates from service providers who will dispose of the general and hazardous waste as evidence that the waste has been disposed of at an appropriate and licenced facility.

Fires:
The collecting and use of vegetation for firewood on the property is prohibited. No open fires will be allowed on site and adequate firefighting equipment should be available on site in good working order at all times as prescribed by the fire management protocols.

Site Clean Up:
The mine operators must ensure that all temporary structures, equipment, materials and facilities used or created on site for, or during mining activities, are removed once the project has been completed. The mining sites must be cleared, and cleaned to the satisfaction of the ECO.

Mining Personnel Safety:
All personnel must wear Personal Protective Equipment during the mining as required.

Emergency Response/Remedial Action Plans:
If an environmental emergency such as fire, oil/fuel spills, sewage pipe burst, floods etc. occurs on site during the mining phase immediate actions must be taken to manage and contain the situation by the mine operator/s and municipality.

Within 24hours of emergency detection the ECO must be informed of the incident, where after ECO will conduct a site visit and recommend further remediation and/or rehabilitation methods to be implemented. Depending on type and extent of emergency that occurred specialists may be contacted to provide specific recommendations.

An incident report must be completed and sent to municipal and governmental authorities.

Incident Reporting:
In order to ensure that the necessary environmental issues are adequately addressed and recorded, the following environmental reporting shall be undertaken:

- Incident reporting; and
- Compliance reporting

In terms of NEMA Section 30 the following shall apply during the occurrence of an “incident” due to the proposed mining activities:

NEMA Section 30. Control of incidents

(1) In this section

(a)”incident” means an unexpected, sudden and uncontrolled release of a hazardous substance, including from a major emission, fire or explosion, that causes, has caused or may cause significant harm to the environment, human life or property;

(b) "responsible person" includes any person who
(i) is responsible for the incident;
(ii) owns any hazardous substance involved in the incident; or
(iii) was in control of any hazardous substance involved in the incident at the time of the incident;

(c) "relevant authority" means
(i) a municipality with jurisdiction over the area in which an incident occurs;
(ii) a provincial head of department or any other provincial official designated for that purpose by the MEC in a province in which an incident occurs;
(iii) the Director-General;
(iv) any other Director-General of a national department

(2) Where this section authorises a relevant authority to take any steps, such steps may only be taken by

(a) the person referred to in subsection (1)(c)(iv) if no steps have been taken by any of the other persons listed in subsection (1)(c);

(b) the person referred to in subsection (1)(c)(iii) if no steps have been taken by any of the persons listed in subsection (1)(c)(i) and (c)(ii);

(c) the person referred to in subsection (1)(c)(ii) if no steps have been taken by the person listed insubsection (1)(c)(i):

Provided that any relevant authority may nevertheless take such steps if it is necessary to do so in the circumstances and no other person referred to in subsection (1)(c) has yet taken such steps.

(3) The responsible person or, where the incident occurred in the course of that person's employment, his or her employer must forthwith after knowledge of the incident, report through the most effective means reasonably available

(a)the nature of the incident;

(b) any risks posed by the incident to public health, safety and property;

(c) the toxicity of substances or by-products released by the incident; and

(d) any steps that should be taken in order to avoid or minimise the effects of the incident on public health and the environment to

(i) the Director-General;
(ii) the South African Police Services and the relevant fire prevention service;
(iii) the relevant provincial head of department or municipality; and
(iv) all persons whose health may be affected by the incident.

(4) The responsible person or, where the incident occurred in the course of that person's employment, his or her employer, must, as soon as reasonably practicable after knowledge of the incident

(a) take all reasonable measures to contain and minimise the effects of the incident, including its effects on the environment and any risks posed by the incident to the health, safety and property of persons;

(b) undertake clean-up procedures;

(c) remedy the effects of the incident;

(d) assess the immediate and long-term effects of the incident on the environment and public health;

(5) The responsible person or, where the incident occurred in the course of that person's employment, his or her employer, must, within 14 days of the incident, report to the Director-General, provincial head of department and municipality such information as is available to enable an initial evaluation of the incident, including

(a) the nature of the incident;

(b) the substances involved and an estimation of the quantity released and their possible acute effect on persons and the environment and data needed to assess these effects;

(c) initial measures taken to minimise impacts;

(d) causes of the incident, whether direct or indirect, including equipment, technology, system, or management failure; and

(e) measures taken and to be taken to avoid a recurrence of such incident.

(6) A relevant authority may direct the responsible person to undertake specific measures within a specific time to fulfil his or her obligations under subsections (4) and (5): Provided that the relevant authority must, when considering any such measure or time period, have regard to the following:

(a) the principles set out in section 2;

(b) the severity of any impact on the environment as a result of the incident and the costs of the measures being considered;

(c) any measures already taken or proposed by the person on whom measures are to be imposed, if applicable;

(d) the desirability of the state fulfilling its role as custodian holding the environment in public trust for the people;

(e) any other relevant factors.

(7) A verbal directive must be confirmed in writing at the earliest opportunity, which must be within seven days.

(8) Should

(a) the responsible person fail to comply, or inadequately comply with a directive under subsection (6);

(b) there be uncertainty as to who the responsible person is; or

(c) there be an immediate risk of serious danger to the public or potentially serious detriment to the environment,

a relevant authority may take the measures it considers necessary to
(i) contain and minimise the effects of the incident;
(ii) undertake clean-up procedures; and
(iii) remedy the effects of the incident.

(9) A relevant authority may claim reimbursement of all reasonable costs incurred by it in terms of subsection (8) from every responsible person jointly and severally.

(10) A relevant authority which has taken steps under subsections (6) or (8) must, as soon as reasonably practicable, prepare comprehensive reports on the incident, which reports must be made available through the most effective means reasonably available to

(a) the public;

(b) the Director-General;

(c) the South African Police Services and the relevant fire prevention service;

(d) the relevant provincial head of department or municipality; and

(e) all persons who may be affected by the incident

See below for a template of an Incident Report to serve as a guideline for the recording and addressing of emergency incidents as and when they occur.

Document Type:	Emergency Incident Report	
	Title:	**(PROPERTY WHERE INCIDENT OCCURRED, DATE AND TYPE OF INCIDENT)**
	Document Status:	Pilot reporting format

Reference:	[A reference that may be used in future correspondence]	**Initial Submission Date:**	[Date of initial submission of the report to the Department: Environmental Affairs and Tourism]
Revision No.:	example	**Compiled by:**	[Full name and contact details of the person submitting the report]

This form provides a template for the emergency incident report required in terms of section 30(5) of the National Environmental Management Act (Act No. 107 of 1998) (hereinafter "NEMA") in which the responsible person or, where the incident occurred in the course of that person´s employment, his or her employer, must, within 14 days of the incident, report to the Director General, provincial head of department and municipality such information as is available to enable an initial evaluation of the incident, including: (a) the nature of the incident; (b) the substances involved and an estimation of the quantity released and their possible acute effect on persons and the environment and data needed to assess these effects; (c) initial measures taken to minimise impacts; (d) causes of the incident, whether direct or indirect, including equipment, technology, system, or management failure; and (e) measures taken and to be taken to avoid a recurrence of such incident.

In terms of section 30(1)(a) of NEMA, an "incident" means an unexpected sudden occurrence, including a major emission, fire or explosion leading to serious danger to the public or potentially serious pollution of or detriment to the environment, whether immediate or delayed.

In line with section 24 of the Constitution of the Republic of South Africa (Act No. 108 of 1996), "serious" is taken to be a measure of the impact of an incident where such an incident has had, could have had, is having, or will have a negative impact on human health or well-being.

RESPONSIBLE PERSON			
In terms of section 30(1)(b) of NEMA, the "responsible person" includes any person who: (i) is responsible for the incident; (ii) owns any hazardous substance involved in the incident; or (iii) was in control of any hazardous substance involved in the incident at the time of the incident			
Name:	[Full name of person, company, etc.]	**Designation:**	[designation of responsible person (n/a for companies, etc.)]
Postal Address:	[Full postal address including postal code]	**Physical Address:**	[Full physical address]
Telephone (B/H)	[Business hours contact telephone number and area code]	**Telephone (A/H)**	[After hours contact telephone number and area code]
Nature of Business:	[Brief summary of the nature of the business]		

EMERGENCY INCIDENT SUMMARY INFORMATION							
Mark the appropriate boxes							
Fire:		**Spill:**		**Explosion:**		**Gaseous Emission:**	
Injuries		**Reportable injuries:**		**Hospitalisation:**		**Fatalities:**	
Open water impacts:		**Ground water impacts:**		**Atmospheric impacts:**		**Soil impacts:**	
Own emergency response involved		**Fire prevention services involved**		**Government hazardous materials emergency response involved**		**More than 1 governmental emergency response service involved**	
Emission of non-toxic substances at low concentrations		**Emission of non-toxic substances at high concentrations**		**Emission of toxic substances at low concentrations**		**Emission of toxic substances at high concentrations**	
No evacuation required		**Immediate area evacuated**		**Immediate surrounds evacuated**		**Evacuation of the general public**	

INITIAL EMERGENCY INCIDENT REPORT				
In terms of section 30(3) of NEMA, the responsible person or, where the incident occurred in the course of that person´s employment, his or her employer must forthwith after knowledge of the incident, report through the most effective means reasonably available: (a) the nature of the incident; (b) any risks posed by the incident to public health, safety and property; (c) the toxicity of substances or byproducts released by the incident; and (d) any steps that should be taken in order to avoid or minimise the effects of the incident on public health and the environment to: (i) the Director General; (ii) the South African Police Services and the relevant fire prevention service; (iii) the relevant provincial head of department or municipality; and (iv) all persons whose health may be affected by the incident.				
Description	**Date:**	**Time:**	**Medium:**	**Contact Details:**
Director General:	[submission date]	[submission time]	[Fax, phone, SMS, letter, etc.)	[who was the report made to?]
SAPS:				
Relevant fire prevention service:				
Relevant province or municipality				
Affected persons:			Provide details of who was contacted and how they were contacted as Annexure A to this report	

INCIDENT DETAILS			
In terms of NEMA section 30(5)(a) and (d), the responsible person must report on the nature of the incident as well as the causes of the incident, whether direct or indirect, including equipment, technology, system, or management failure			
Incident start time:	[The exact time that the unexpected event started]	**Incident duration:**	[the duration of the unexpected event]
Duration of danger:	[The time taken from the start of the event to the time when the impacts of the event no longer posed a threat to anyone's health or well-being]	**Duration of exposure:**	[The duration of conditions that had a direct impact anyone's health or well-being]
Incident description	[Brief description of the incident detailing, but not limited to, a description of: (i) what happened; (ii) how it happened; (iii) where it happened; (iv) the timing and sequence of events; and (v) why it happened. A detailed discussion may be included as an annex.]		
	Plans, diagrams, maps or any other graphical material relating to the incident description must be attached as annexures B1, B2, etc.		
Wind speed and direction	[The wind speed and direction at the point of the incident at the time of the incident]	**Ambient air temperature**	[ambient air temperature at the time of the incident]
Weather conditions	[Sunny, light rain, mist, heavy rain, etc.]	**Other relevant meteorological conditions**	[Temperature inversion, floods, etc]

POLLUTANTS RELEASED DURING INCIDENT					
In terms of NEMA section 30(5)(b), the responsible person must report on the substances involved and an estimation of the quantity.					
List all the pollutants directly released during the incident (i.e. exclude those pollutants that resulted from mitigation measures, e.g. flaring, treatment, dilution etc.)					
Substance or mixture of substances	**Reference Number**	**Phase**	**Total Quantity emitted**	**Unit**	**Nature of emission**
[The name recognised by any national or internationally recognised chemical referencing system]	[Reference to any national or internationally recognised chemical referencing system]	[solid, semi-solid, liquid or gas]	[the total measured or estimated quantity released into the environment]	[the unit of measure in respect to the quantity]	[emitted from truck, underground pipe, stack, etc.]

SECONDARY POLLUTANTS RESULTING FROM INCIDENT					
In terms of NEMA section 30(5)(b), the responsible person must report on the substances involved and an estimation of the quantity released.					
List all the pollutants that resulted from mitigation measures, e.g. flaring, treatment, dilution etc.					
Substance or mixture of substances	**Reference Number**	**Phase**	**Total Quantity emitted**	**Unit**	**Nature of emission**
[The name recognised by any national or internationally recognised chemical referencing system]	[Reference to any national or internationally recognised chemical referencing system]	[solid, semi-solid, liquid or gas]	[the total measured or estimated quantity released into the environment]	[the unit of measure in respect to the quantity]	[emitted from truck, underground pipe, stack, etc.]

1. POLLUTANT CONCENTRATIONS					
In terms of NEMA section 30(5)(b), the responsible person must report on the substances involved and an estimation of the quantity released.					
List all the pollutants detailed in sections **Error! Reference source not found.** and **Error! Reference source not found. Error! Reference source not found.**.					
1.1 Substance or mixture of substances	**1.2 Reference Number**	**1.3 Estimated pollutant concentration**			
		1.4 10m	**1.5 100m**	**1.6 500m**	**1.7 Concentration unit (e.g. ppm)**
[The name recognised by any national or internationally recognised chemical referencing system]	[Reference to any national or internationally recognised chemical referencing system]	[estimate the concentration of the pollutant in water, soil and/or air within a 10m radius of the epicentre of the incident]	[estimate the concentration of the pollutant in water, soil and/or air within a 100m radius of the epicentre of the incident]	[estimate the concentration of the pollutant in water, soil and/or air within a 500m radius of the epicentre of the incident]	[[Provide the unit of concentration used in columns 1.4, 1.5 and 1.6.]

INCIDENT IMPACT	
In terms of NEMA section 30(5)(b), the responsible person must report on possible acute effect on persons and the environment and data needed to assess these effects;	
Minor injuries	[Describe the number and types of any minor injuries that resulted from the incident or efforts to manage the incident or the impacts thereof]
Reportable injuries	[Describe the number and types of any injuries requiring statutory reporting that resulted from the incident or efforts to manage the incident or the impacts thereof]
Hospitalisation	[Describe the number and types of any injuries that required professional medical care that resulted from the incident or efforts to manage the incident or the impacts thereof]
Fatalities	[Describe the number and cause of any fatalities that resulted from the incident or efforts to manage the incident or the impacts thereof]
Biological impacts	[Describe any impacts on biological life, other than human life, e.g. fish kills, plant mortality, etc.]
Impact area	[Describe the area possibly affected by the incident or the impacts thereof including: (i) size of the area; (ii) socio-economic context; (iii) population density; (iv) sensitive environments (if any), etc.]
Data	Attach relevant impact reports, medical reports, death certificates, post mortem reports, environmental monitoring data, etc. as Annexes C1, C2,… to this report

EXISTING PREVENTION PROCEDURES AND/OR SYSTEMS	
Foresight	[Briefly describe whether the incident could have, or had, been foreseen, e.g. was it included in any environmental impact assessment, risk assessment, health and safety plan, etc.]
Procedures and/or systems	Attach any relevant safety, health and environmental plans (including any statutory planning requirements) that detail what actions should be taken in the event of the incident that is the subject of this report
Procedure and/or systems failures	[Describe any failures or shortfalls in procedures and/or systems that may have contributed to the incident]
Technical measures	[Describe any technical measures, equipment, 'fail-safe' devices, etc. that are in place to prevent the occurance of the incident]
Technical failure	[Describe any failures of technical measures, equipment, 'fail-safe' devices, etc. that are in place to prevent the occurance of the incident]

2. INITIAL INCIDENT MANAGEMENT	
In terms of NEMA section 30(5)(c), the responsible person must report on initial measures taken to minimise impacts.	
2.1 Evacuation	[Describe any evacuation activities including information on the number of people evacuated and whether these people were staff or otherwise]
2.2 Technical measures	[Describe all technical measures taken to address the incident]
2.3 Mitigation measures	[Describe all measures taken to minimise the impact]
2.4 Emergency Services	[Describe any governmental emergency services involvement]

3. CLEANUP AND/OR DECONTAMINATION	
In terms of NEMA section 30(5)(c), the responsible person must report on initial measures taken to minimise impacts.	
3.1 Cleanup and/or decontamination	[Provide a detailed description of all cleanup and/or decontamination activities and the environmental quality and impacts resulting from these activities as well as contact details for any contracted service providers in an annex.]

Permissions and Instructions

Provide details of any permissions and/or instructions received from any organ of state during initial incident management, cleanup and/or decontamination

3.2 Type	3.3 Statuate	3.4 Issued By	3.5 Details
[Describe the nature or type of permission or instruction]	[Provide a reference to the legal mandate for the permission or instruction]	[Provide contact details for the permitting or instructing authority]	[provide a summary of the activities carried out in terms of the permission or instruction]

MITIGATION MEASURES			
In terms of NEMA section 30(5)(e), the responsible person must report on measures taken and to be taken to avoid a recurrence of such incident.			
Measure	**Objective**	**Cost**	**Timing**
[Briefly describe each of the measures taken, and to be taken, to avoid a recurrence of such incident]	[Briefly describe the objective of the measure, i.e. the desired outcome of the measure]	[Estimate the cost of the measure in terms of capital costs and/or recurrent costs]	[Provide information on the timing for the full implementation of the measure]

4. AUTHORISATIONS			
Provide detail on all authorisations (including permits, licenses, certificates, etc.) in respect of the activity to which the incident relates.			
4.1 Type	**4.2 Statuate**	**4.3 Issued By**	**4.4 Issue & Expiry Date**
[Describe the nature or type of authorisation, e.g. Registration Certificate]	[Provide the reference for the authorisation, e.g. section X of the National Environmental Management Act (Act No. 107 of 1989)]	[Provide contact details for the issuing authority]	[provide the date of issue and expiry]

HISTORY			
Provide details on any and every similar incident involving the responsible person in the last 24 months. Similar incidents include those that: (i) involved similar circumstances; (ii) involved similar emissions; (iii) involved similar personal; and/or (iv) involved similar impacts.			
Incident title	**Report reference**	**Date of incident**	**Summary of event**
[Provide the title used in the relevant emergency incident report]	[Provide the reference in respect of the relevant emergency incident report]	[Date of incident]	[Provide a summary of the event]

Signed by, or as a mandated signatory for, the responsible person:		Date:	

UNDERTAKING

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. √

Signature of the environmental assessment practitioner:

Eco Impact Legal Consulting

Name of company:

18 January 2019

Date:

-END-