

NAME OF APPLICANT: CHINA AFRICAN PRECIOUS METALS (PTY) LTD. – ORKNEY GOLD MINE

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PHYSICAL ADDRESS: 35 BALLYCLARE DRIVE, BALLY OAKS OFFICE PARK, BRYANSTON, 2021

DMR REFERENCE NO.: NW 30/5/1/2/2/76 MR

SHANGONI
Management Services (Pty) Ltd



RISK ASSESSMENT FOR THE ENVIRONMENTAL IMPACT ASSESSEMENT AND ENVIRONMENTAL MANAGEMENT PROGRAMME

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1. Background description

The seven (7) shafts that constitutes CAPM Orkney Gold Mine, initially formed part of the Anglo American Vaal Reef Operation and were named No.'s 1 to 7 shafts. The ownership of the shafts then changed to African Rainbow Minerals (Pty) Ltd. (ARMgold) and consisted of ARMgold 1 (No.1, No.2 and No.5 shaft) and ARMgold 2 (No.3, No.4, No.6 and No.7 Shaft). In October 2003, ARMgold merged with Harmony Gold and the mines name changed to the Harmony Orkney Operation No.1 to No.7 shafts.

Pamodzi Gold bought the operations from Harmony Gold in March of 2008, however Pamodzi was provisionally liquidated in March of 2009 and final liquidation granted in October 2009. In late 2009, Aurora Empowerment Systems took over management of the Orkney Operations. The operations remained dormant until 2011, when Pamodzi Gold entered into a sales agreement with CAPM in August 2011. The sales agreement with CAPM included the full acquisition of all assets of the Orkney Gold Mine.

CAPM Orkney Gold Mine therefore proposes to re-commence operations initially at the No.7 Shaft. The shaft will be dewatered and reconditioned with depth. Once mining commences within the No.7 Shaft, the dewatering of the No.6 Shaft will commence and the shaft reconditioned with depth, whereafter mining within the No.6 Shaft will commence. Approximately two (2) years after the commencement of mining activities within the No.7 Shaft and the No.6 Shaft, the CAPM Orkney Gold Mine will investigate the viability of re-commencing mining operations within the No.4 Shaft and the No.1 Shaft. Should it be found viable, the No.4 Shaft and the No.1 Shaft will be dewatered, the shafts reconditioned and mining operations will recommence.

2. Description of the activities to be undertaken

2.1 Mineral to be mined

The mine is situated on a portion of the Klerksdorp Gold Fields. It exploits gold bearing conglomerates of the Central Rand and Ventersdorp Groups that are some of the several major gold fields situated on the northern and western margins of the 320km by 160km area of preservation of Central Rand Sediments. Gold is produced as the primary product with uranium as a potential by-product.

2.2 Description of the main mining activities and processes

The CAPM Orkney Gold Mine is an existing mine situated on a portion of the Klerksdorp Gold Field. As described above, the operation was subsequently sold to CAPM in 2011 through a Section 11 Application. The operation has been in under care and maintenance since 2009. The mine consists of seven shaft areas (as described in Part 4.2.1 above). CAPM Orkney Gold Mine intends to commence



with operations at the No.7 and No.6 shafts. Approximately two (2) years after the commencement of operation at the No.7 and No. 6 shaft, CAPM will investigate the viability of commencing with operations at the No. 4 and No. 1 Shaft.

As it stands, operations at the No.3 Shaft will not commence as the shaft barrel was twisted. It is for this reason that CAPM is currently in the process of decommissioning and rehabilitating this shaft area. The head gear and associated infrastructure has been removed and the shaft has been capped. Similarly, operations at the No.5 Shaft will not commence as operations at the shaft have ceased and the majority of the infrastructure (excluding the shaft and headgear) have been decommissioned and removed. CAPM is therefore also in the process of decommissioning and rehabilitating this shaft area.

CAPM received permission from the DMR to gain access up to a level of 60 m below the surface, in order to re-equip both No.6 and No.7 Shafts with steel, which has been completed. Once full operations commence, dewatering of the No. 7 Shaft will take place at approximately 1.3 Megalitres per day (a Water Use Licence for this water use will be in place). Upon reaching the base level of the No.7 Shaft (approximately 1420 m below the surface), dewatering of the No. 6 Shaft will occur. The No. 4 Shaft will remain as an emergency exit shaft until operations commence at that shaft.

2.2.1 Mining method

The mining method to be employed at the CAPM Orkney Gold Mine is conventional scattered breast mining consisting of the standard deep level underground stoping layout, for extraction of narrow generally flat dipping gold reefs occurring deeper than 500m below surface.

2.2.2 Ore Processing

No ore processing activities will be undertaken at the CAPM Orkney Gold Mine. All ore mined at the CAPM Orkney Gold Mine will be transported to the surface where it will be temporarily stockpiled at the shaft area. The ore will then be transported via haulage trucks to the Nicolor South Plant, located at the Buffelsfontein Gold Mine for processing.

The main metallurgical processes undertaken at the Nicolor South Plant are follows:

- Ore reception.
- Milling.
- Thickening.
- Leaching.
- Adsorption.
- Elution.
- Smelting.



A description of each of these processes is provided below with *Figure 1* below presenting the process flow of the Nicolor South Plant.

4.2.3.2.1 Ore reception

Ore is transported to the plant via haulage truck. Prior to entering the plant, the mass is measured at the plant weighbridge. The ore is then placed on pads according to source. At the appropriate time the ore is then conveyed to a stockpile which sits on four vibro-feeders that feed two grinding mills.

4.2.3.2.2 Milling

The Grinding Mill is a large revolving cylinder in which size reduction of the ore (to 75 microns) takes place. The size reduction is by self grinding and impact (steel balls are added into the mill to assist). Water is added to the milling process in order to allow for efficient milling and ease of transport. The resultant slurry (approximately 15% solids) is then pumped to the thickening section.

4.2.3.2.3 Thickening

Excess water is removed through the utilisation of large settling tanks known as thickeners. The thickened slurry (approximately 50% solids) is then pumped to the leaching section.

4.2.3.2.4 Leaching

The thickened slurry flows into tanks which provide sufficient retention time to allow the gold in the solids to be dissolved by an oxygenated cyanide solution.

4.2.3.2.5 Adsorption

After the leaching process, the gold in solution is pumped to the CIP section where gold is adsorbed onto carbon in a set of tanks.

4.2.3.2.6 Elution

The gold loaded carbon is then pumped to the elution circuit where the gold is desorbed with superheated water. The desorbed gold in solution is in turn passed through an electro-winning circuit which extracts gold from the solution using an electrical current. The gold in solution is deposited on steel wire wool cathodes.

4.2.3.2.7 Smelting

The gold coated wire wool is removed from the electrowinning cell and then calcined. After calcination the resulting material is then smelted to produce a gold bar.



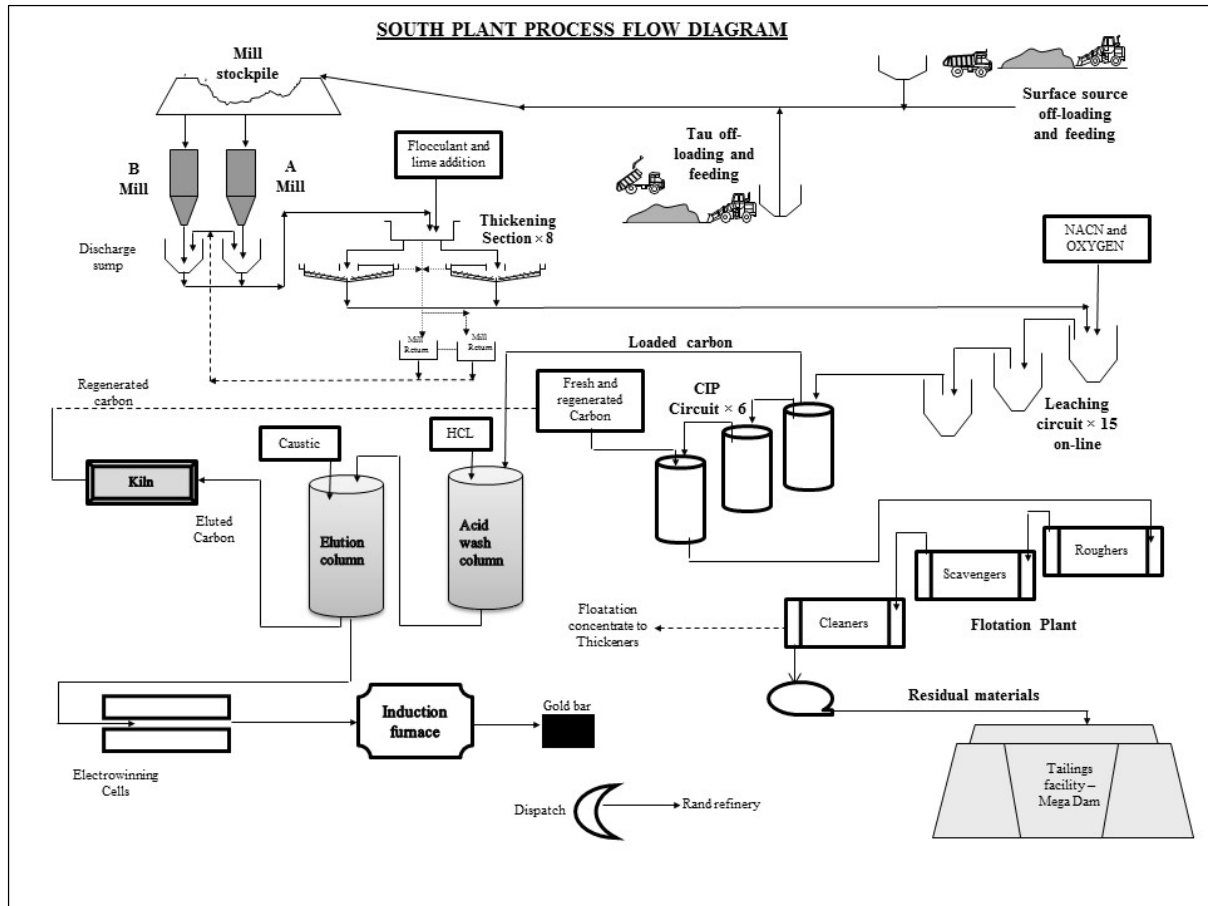


Figure 1: Nicolor South Plant process flow diagram

2.2.3 Mine and plant residue

As described above, all ore mined at the CAPM Orkney Gold Mine will be transported to the Nicolor South Plant, located at the Buffelsfontein Gold Mine, for processing. As a result, the mine does not have and will not have any mine or plant residue stockpiles. As described above in Part 4.2.2.2, all residue produced by the Nicolor South Plant is deposited on the Mega Dam Tailings Facility, which is located to the north-east of the plant. The Mega Dam Tailings Facility is however the property of AGA and an agreement is in place between the Nicolor South Plant and AGA for the deposition of the plant residue. The tailings facility is therefore the responsibility of AGA.

2.2.4 Linear activities: mineral transport on site

The ore that is mined at the CAPM Orkney Gold Mine is transported to the surface whereafter it is either temporarily stockpiled (in a designated area) or transported via haulage trucks directly to the Nicolor South Plant, dependent on the plant processing capability. A maximum of 40 ktpm of ore will be transported, via road, per month.

2.2.5 Linear activities: Mineral transport off-site

As described above, the ore will be transported via haulage trucks to the Nicolor South Plant for processing. The current formal road network will be utilised to transport ore from the various shafts to the Nicolor South Plant. Ore from the No. 6 and No. 7 shafts (the first shafts to commence with operation) will transported via haulage trucks along the R502, which is an approximate distance of 18 km.

2.2.6 Water management

Groundwater

Once operations at the No.7 Shaft commence, all shaft water (fissure water accumulating within the shaft) will pumped to surface and pumped directly to the AngloGoldAshanti Vaal River Operations plant located adjacent to the No.7 Shaft area. CAPM Gold and AngloGoldAshanti Vaal River Operations are currently in negotiations regarding the acceptance of the shaft water.

Storm water

As part of the conceptual SWMP, each management area at the CAPM Orkney Gold Mine operation and respective shaft areas is discussed by indicating the main drainage philosophy anticipated using contour data and the current / proposed runoff control strategies. The location as well as direction of clean and affected runoff is indicated in the SWMP.

Process water

As no ore processing activities are undertaken at the CAPM Orkney Gold Mine, no process water is required or generated.

Potable water

Potable water at the CAPM Orkney Gold mine is obtained from three (3) sources, namely, Mid-vaal (non-profit organisation), the City of Matlosana Local Municipality and AngloGoldAshanti Vaal River Operations (AGA). Table 1 below presents the sources of potable water at the various shaft areas.

Table 1: Sources of potable water at the CAPM Orkney Gold Mine

Shaft	Potable water source
No. 1 Shaft	None.
No. 2 Shaft	None.
No. 3 Shaft	None.
No. 4 Shaft	Potable water at the No. 4 Shaft Hostel is currently obtained from Mid-Vaal.
No. 5 Shaft	Potable water at the No. 5 Shaft hostel is currently obtained from AGA. A verbal agreement is currently in place between CAPM and AGA for the use of potable water and a written agreement/contract is in the



Shaft	Potable water source
	process of being obtained. AGA provides CAPM with monthly invoices for the current potable water requirements.
No. 6 Shaft	Potable water at the No. 6 Shaft is currently obtained from the City of Matlosana Local Municipality.
No. 7 Shaft	All potable water requirements at the No. 7 shaft are obtained from AGA. A verbal agreement is currently in place between CAPM and AGA for the use of potable water and a written agreement/contract is in the process of being obtained. AGA provides CAPM with monthly invoices for the current potable water requirements.

2.2.7 Non-mineral Waste management

General waste at the shaft areas of the CAPM Orkney Gold Mine is disposed of / collected in appropriately marked bins. General waste accumulating in these bins as well as collected at the hostels and office areas are removed by a suitable contractor to a licenced landfill facility. Hazardous waste (such as oil, grease fluorescent light bulbs) are stored in marked bins at designated areas across the shaft areas and are serviced by a suitable contractor for disposal at a licenced disposal facility.

2.3 Estimated reserves

The information in this part of the document was sourced from the mineral resources technical document titled: “*An independent JORC 2012 Technical Report on the Mineral Resources for the Orkney Mine North-West Province, South Africa, on behalf of China African Precious Metals (Pty) Ltd.*” dated July 2014 and compiled by Minxcon (Minxcon, 2014).

The depleted Mineral Resources per shaft for the Orkney Operations for 2014 are listed in the following tables.

Table 2: 2014 Mineral Resource Statement for the No.2 Shaft (extracted from Minxcon, 2014)

Orkney 2	Mt	Grade	Tonnes Au	Moz
		g/t		
Measured	2.29	15.22	34.89	1.12
Indicated	0.52	12.99	6.77	0.22
M&I	2.81	14.83	41.66	1.34
Inferred	0.41	13.91	5.64	0.18
Total	3.22	14.69	47.3	1.52



Table 3: 2014 Mineral Resource Statement for the No.4 Shaft (extracted from Minxcon, 2014)

Orkney 4	Mt	Grade	Tonnes Au	Moz
		g/t		
Measured	8.37	11.05	92.45	2.97
Indicated	5.06	10.75	54.41	1.75
M&I	13.43	10.94	146.86	4.72
Inferred	10.77	6.39	68.84	2.21
Total	24.2	8.91	215.7	6.93

Table 4: 2014 Mineral Resource Statement for the No.6 Shaft (extracted from Minxcon, 2014)

Orkney 6	Mt	Grade	Tonnes Au	Moz
		g/t		
Measured	11.89	6.78	80.56	2.59
Indicated	3.89	6.33	24.6	0.79
M&I	15.78	6.66	105.16	3.38
Inferred	10.17	4.83	49.08	1.58
Total	25.95	5.94	154.24	4.96

Table 5: 2014 Mineral Resource Statement for the No.7 Shaft (extracted from Minxcon, 2014)

Orkney 7	Mt	Grade	Tonnes Au	Moz
		g/t		
Measured	4.03	5.8	23.37	0.75
Indicated	2.61	5.47	14.29	0.46
M&I	6.64	5.67	37.66	1.21
Inferred	11.3	4.15	46.84	1.51
Total	17.94	4.71	84.5	2.72

Table 6: Ore Reserve Statement – April 2014 (extracted from MWP, 2015)

Mineral Reserve Category	Shaft or Area	Tonnes	Au	Grade	Au
		Mt	000kg	g/t	Moz
Proven	Orkney 6	1.76	7.01	4.00	0.23
	Orkney 7	0.45	1.78	3.99	0.06
	Orkney 4	0.81	5.82	7.18	0.19
Total Proven		3.01	14.61	4.85	0.47
Probable	Orkney 6	0.50	1.79	3.59	0.06
	Orkney 7	0.02	0.06	3.39	0.00
	Orkney 4	0.26	1.29	5.04	0.04
Total Probable		0.77	3.14	4.06	0.10
Total Ore Reserve		3.78	17.75	4.69	0.57



Table 7: 2014 Inferred mineral resources for the CAPM Orkney Gold Mine (extracted from Minxcon, 2014)

Mineral Resource Category	Shaft or Area	Tonnes	Au	Grade	Au
		Mt	000kg	g/t	Moz
Inferred	Orkney 6	10.17	49.08	4.83	1.58
	Orkney 7	11.30	46.84	4.15	1.51
	Orkney 2	0.41	5.64	13.91	0.18
	Orkney 4	10.77	68.84	6.39	2.21
Total		32.65	170.41	5.22	5.48

2.4 Production rate and Life of Mine

The estimated production rate will be 1.56Mtpa to the Nicolor South Plant (130ktpm). There will be a build-up for the first 4 years.

The total period for which authorisation is required (Life of Mine), is approximately 12 years, with a breakdown as provided in Table 8 below.

Table 8: Breakdown of the Life of Mine

Stages of operation	Timeframe (Years)
Planning	N/A
Construction	N/A
Commissioning	0.5 years
Operation	10 years
Closure	1.5 year
Total Period	12 years



3. Alternatives associated with the proposed project

The following definition of “alternatives” is given in the EIA Regulations of 18 June 2010: “alternatives”, in relation to the proposed activity, *means different means of meeting the general purpose and requirements of the activity, which may include alternatives to-*

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

A number of alternatives have been identified and will be evaluated for the proposed project. These alternatives are as follows:

- Process alternatives.
- Scheduling alternatives.
- No-go Option.
- Land use alternatives.

3.1 Details of all alternatives considered

As described in Part 1 above, the CAPM Orkney Gold Mine is an existing gold mine that CAPM purchased from Pamodzi. As part of the purchase agreement, CAPM purchased all assets and infrastructure associated with the Orkney Gold Mine. Therefore no alternative site locations could be considered due to the mine being an existing mine, that was operational in the past. However based on the Department of Environmental Affairs Integrated Environmental Management Series 11 “*Criteria for determining Alternatives in EIA*” dated 2004, alternatives in terms of activity, process, schedule and the “No-go options” were identified.

3.1.1 Proposed activity

The proposed activity is to reinstate the mining of gold bearing ore utilising the conventional scattered breast mining method consisting of the standard deep level underground stoping layout at the No.7 Shaft. The operations will initially commence at the No.7 Shaft through the dewatering of the shaft and the reconditioning of the shaft with depth. Once mining operations within the No.7 Shaft commence, the dewatering and shaft recondition of the No.6 Shaft will take place, whereafter mining within the No.6 Shaft will commence. All shaft water abstracted from the No.7 and the No.6 Shaft will be supplied to the AngloGold Ashanti Vaal River Operations (AGA) processing plant (an agreement between AGA and CAPM, for AGA to accept the water, is in the process negotiations). All ore mined within the No.7 and



No.6 Shaft will be hoisted to surface and transported by haulage truck (utilising the formal road network) to the Nicolor South Plant, where the gold bearing ore will be processed. Therefore CAPM does not and will not (for the time being) own and/or manage any mine and plant residue deposits.

Once operations at the No.7 and the No.6 Shafts are successfully underway, the CAPM Orkney Gold Mine will investigate the viability of re-commencing operations at the No.4 Shaft (approximately 2 years after and the No.1 Shaft (approximately two (2) years after commencement at the No.6 Shaft).

3.1.2 Process alternatives

Two alternatives have been identified in terms of process and include the following:

- Construction of a processing plant to process the mined ore.
- Utilisation of an existing processing plant to process the mined ore.

The preferred alternative for the CAMP Orkney Gold Mine is transport the mined ore to the Nicolor South Plant for processing. Although this alternative has high cost investment over the long term due to processing fees and transport costs, the plant is not owned or operated by CAPM and therefore no mine and plant residue deposits will be owned or managed by CAPM. The construction of a processing plant will be a very high initial cost investment but will however allow for a greater return on investment.

3.1.3 Scheduling alternatives

Two alternatives in terms of scheduling have been identified and these include:

- The commencement of operations initially at the No.7 Shaft, then the No.6 Shaft and approximately after two (2) years operations will commence at the No.4 Shaft and No.1 Shaft.
- The commencement of operations at all of the shafts at once.

The preferred alternative, in terms of scheduling, is to initially only commence operations at the No.7 Shaft and then the No.6 Shaft and then in approximately two (2) years, commence operations at the No.4 Shaft and the No.1 Shaft. This alternative is preferred due to the very high investment required to recondition the shafts and all associated infrastructure, of all seven shafts, in order to be safe for operations in terms of MPRDA, 2002 and the Mine Health and Safety Act, 1996 (Act No. 29 of 1996) (MHSA, 1996).

3.1.4 No-go option

If the gold reserves within the CAPM Orkney Gold Mine Mining Right area are not mined at this time, the *status quo* environmental conditions within the Mining Right area will continue until change in activity and/or development occurs within or close to this area.



Physical and biophysical environment – The proposed project is expected to create a number of environmental impacts of which not all may necessarily effectively mitigated and include impacts on surface water and most notably, groundwater. Acid mine drainage is likely to develop due to the interactions of the groundwater with the pyrite that constitutes 10% to 30% of the VCR. As the groundwater is allowed to recharge and flood the shafts, it may become contaminated and acidic and upon reaching the Environmental Critical Level (ECL) (Refer to Chapter I of Part 7.4.1 of the EIA and EMPr) the aquifers will become contaminated.

Social – The CAPM Orkney Gold Mine is situated within the vicinity of the town Orkney. The proposed re-commencement of the operations at the No.7 Shaft and the No.6 Shaft (initially) will result in the creation of job opportunities. As stipulated in the CAPM Orkney Gld Mine SLP (refer to the Annexure Annexure G of the EIA and EMPr) the CAPM Orkney Gold Mine will employ approximately 471 individuals, of which the majority (a minimum of 95%) will be sourced from the local community. This will therefore result in the experience of a positive impact in terms of social as well as economic aspects. However, should the “no-go option” be implemented, the baseline status quo will remain with no additional job creation. Several potential impacts in terms of social aspects are also likely to be generated as a result of the re-instatement of operations at the CAPM Orkney Gold Mine and include: increase traffic, impacts on sense of place, dust generation, influx of jobseekers to the area (including the increased crime, spread of HIV) and visual aspects. It is however important to note that the CAPM Orkney Gold Mine is an existing mine that was purchased by CAPM in 2011 and mining within the area has taken place for over a century. Therefore the local community and regular visitors to the area would be desensitised to the mining activities that will be conducted.

Economic – In the event that the “no-go option” is implemented, several existing jobs will be lost and skills development may cease. The positive impacts associated with the creation of 471 jobs and contributions of the mine to the local economy would therefore be lost. The remaining gold bearing ore body will also remain *in situ* and unutilised. It is however important to note that should the CAPM Orkney Gold Mine not proceed with the proposed re-instatement of operations, the mining of the gold reserves may not necessarily be avoided as the Mining Right could be sold to another company unless the DMR declares the reserves “off-limits” and sterilises these reserves.

3.1.5 Land use alternatives

The following land use alternatives have been identified and were investigated and are briefly compared in Table 9 below:

- Re-instatement of mining at the No.7 Shaft and No.6 Shaft.
- Rehabilitate and utilise the surface area for grazing of livestock / No-go option.
- Rehabilitate and utilise the surface area for crop production / No-go option.
- Rehabilitate the surface area to wilderness / No-go option.



Major impacts associated with each land use alternative have been summarised for comparative purposes. Each proposed land use alternative may impact on the natural environment at the proposed site.



Table 9: Land use alternative assessment

Environmental component	Mining – current land use	Grazing / No-go option	Crop production / No-go option	Wilderness / No-go option
	Re-instatement of mining at the No.7 Shaft and No.6 Shaft			
Geology	The mining and removal of gold bearing ore will result in the permanent destruction of the localised geological strata.	No impact.	No impact.	No impact.
Topography	No further impacts	Overgrazing may result in soil erosion which in turn may alter the topography.	Topography of the area may be altered during the contouring and establishment of crop fields.	No impact.
Soil	Soil surrounding the shaft areas may be contaminated in the event that contaminated surface water runoff enter the receiving environment.	Overgrazing may result in the exposure of bare soils to the elements, which may lead to erosion.	Soils will may be chemically and physically modified.	Soil erosion may occur should rehabilitation of the shaft surface area not be conducted in an appropriate manner.
Land use	No further impacts.	Land use will change to agriculture.	Land use will change to agriculture.	Land use will change.
Land capability	No further impacts. However, soil surrounding the shaft areas may be contaminated in the event that contaminated surface water runoff enter the receiving environment.	Land capability may be lowered if overgrazing occurs.	Land capability may be impacted on if poor farming techniques are implemented.	Land capability may be impact upon should rehabilitation not be conducted in an appropriate manner.
Flora	The edge effects of mining may impact on the natural vegetation.	Natural vegetation may be impacted on if overgrazing occurs.	Natural vegetation may be impacted on should agricultural	In the event that rehabilitation is not conducted in an appropriate



Environmental component	Mining – current land use Re-instatement of mining at the No.7 Shaft and No.6 Shaft	Grazing / No-go option	Crop production / No-go option	Wilderness / No-go option
			activities occur within the natural vegetation areas.	manner, alien and invasive species may establish.
Fauna	The edge effects of mining may impact on the fauna.	No impact if overgrazing is prevented.	Natural vegetation may be impacted on should agricultural activities occur within the natural and indigenous vegetation areas. This in turn may lead to the destruction of habitats and thus impacting on the species diversity of the area.	The establishment of alien and invasive plant species may result in a decline in habitat diversity and integrity.
Surface water	Downstream surface water quality may be compromised should contaminated surface leave the shaft area and enter the receiving environment.	Overgrazing may lead to soil erosion and may have an impact on the downstream surface water quality.	Soil erosion may have an impact on the downstream surface water quality. Surface water runoff may also become contaminated should it come into contact with the chemicals and/or fertilisers.	In the event that rehabilitation has been insufficiently conducted, soil erosion may lead to an increase in suspended sediment that may affected the quality of the surface water resources in the vicinity. The areas that have been reshaped may lead to the ponding of surface water, thereby in
Groundwater	Groundwater may become contaminated should it come into contact with pyrite bearing rock.	No further impact.	No further impact.	No further impact.



Environmental component	Mining – current land use Re-instatement of mining at the No.7 Shaft and No.6 Shaft	Grazing / No-go option	Crop production / No-go option	Wilderness / No-go option
	Should this water reach the Environmental Critical Zone, the aquifers will become contaminated.			
Air quality	Dust may be generated as a result of the proposed mining activities.	Dust may be generated if overgrazing occurs and bare soil is exposed to the elements.	Dust will be generated after the harvest season as bare soil will be exposed to the elements.	No further impact.
Noise	Noise levels will increase as a result of the proposed mining and mining related activities.	No further impact.	No further impact.	No further impact.
Visual	The visual environment will be altered and may impact on the sense of place of the area. However the community is likely desensitised to the mining activities as mining has been conducted for over a century in this area.	No further impact.	The planting of crops will alter the visual environment, but will not be intrusive.	No further impact.
Sensitive landscapes	Should contaminated surface water runoff leave the shaft areas and enter the surrounding	No further impact.	No further impact.	No further impact.



Environmental component	Mining – current land use Re-instatement of mining at the No.7 Shaft and No.6 Shaft	Grazing / No-go option	Crop production / No-go option	Wilderness / No-go option
	environment, the natural vegetation may be impacted upon.			
Sites of archaeological and cultural interest	It is not anticipated that the reinstatement of operations at the No.7 and No.6 Shaft will result in an impact on any sites of archaeological and cultural interest. It is however important to note that there are workshops located on the No.7 Shaft area which are protected under the National Heritage Act, 1999 (Act No. 25 of 1999). The appropriate authorisation is therefore required to remove this infrastructure.	No further impact. It is however important to note that there is infrastructure located on the No.7 Shaft area which are protected under the National Heritage Act, 1999 (Act No. 25 of 1999). The appropriate authorisation is therefore required to remove this infrastructure.	No further impact. It is however important to note that there is infrastructure located on the No.7 Shaft area which are protected under the National Heritage Act, 1999 (Act No. 25 of 1999). The appropriate authorisation is therefore required to remove this infrastructure.	No further impact. It is however important to note that there is infrastructure located on the No.7 Shaft area which are protected under the National Heritage Act, 1999 (Act No. 25 of 1999). The appropriate authorisation is therefore required to remove this infrastructure.
Socio-economic	Job security of the mines current employees will increase, along with other benefits arising from the Social and Labour Plan. The reinstatement of operations will also allow for the creation of 471 jobs.	Some jobs may be created.	Some jobs may be created.	No further impact.



Environmental component	Mining – current land use Re-instatement of mining at the No.7 Shaft and No.6 Shaft	Grazing / No-go option	Crop production / No-go option	Wilderness / No-go option
Interested and affected parties	Surrounding landowners may be further impacted upon as a result of impacts listed above.	Surrounding landowners may be further impacted upon as a result of impacts listed above.	Surrounding landowners may be further impacted upon as a result of impacts listed above.	No further impact.



4. Methodology used in determining and ranking potential environmental impacts and risks

The environmental risk of any aspect is determined by a combination of parameters associated with the impact. Each parameter connects the physical characteristics of an impact to a quantifiable value to rate the environmental risk.

Impact assessments should be conducted based on a methodology that includes the following:

- Clear processes for impact identification, predication and evaluation.
- Specification of the impact identification techniques.
- Criteria to evaluate the significance of impacts.
- Design of mitigation measures to lessen impacts.
- Definition of the different types of impacts (indirect, direct or cumulative).
- Specification of uncertainties.

After all impacts have been identified, the nature and scale of each impact can be predicted. The impact prediction will take into account physical, biological, socio-economic and cultural information and will then estimate the likely parameters and characteristics of the impacts. The impact prediction will aim to provide a basis from which the significance of each impact can be determined and appropriate mitigation measures can be developed.

The risk assessment methodology is based on defining and understanding the three basic components of the risk, i.e. the source of the risk, the pathway and the target that experiences the risk (receptor). Refer to Figure 2 below for a model representing the above principle (as contained in the DWA's Best Practice Guideline: G4 – Impact Prediction).

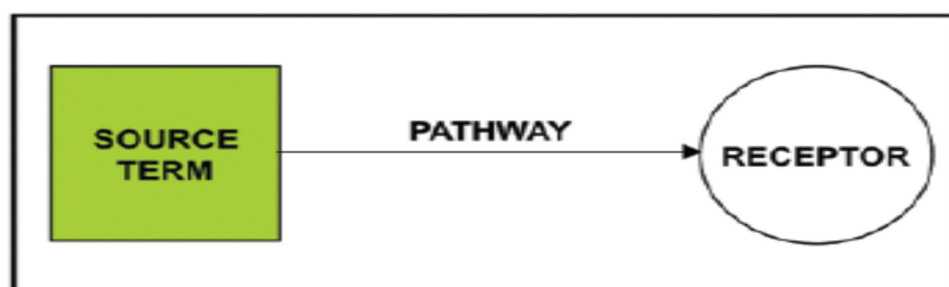


Figure 2: Impact prediction model

Table 10 and Table 11 below indicate the methodology to be used in order to assess the Probability and Magnitude of the impact, respectively, and Table 12 provides the Risk Matrix that will be used to plot the Probability against the Magnitude in order to determine the Severity of the impact.



Table 10: Determination of Probability of impact

SCORE	FREQUENCY OF ASPECT / UNWANTED EVENT	AVAILABILITY OF PATHWAY FROM THE SOURCE TO THE RECEPTOR	AVAILABILITY OF RECEPTOR
1	Never known to have happened, but may happen	A pathway to allow for the impact to occur is never available	The receptor is never available
2	Known to happen in industry	A pathway to allow for the impact to occur is almost never available	The receptor is almost never available
3	< once a year	A pathway to allow for the impact to occur is sometimes available	The receptor is sometimes available
4	Once per year to up to once per month	A pathway to allow for the impact to occur is almost always available	The receptor is almost always available
5	Once a month - Continuous	A pathway to allow for the impact to occur is always available	The receptor is always available

Step 1: Determine the **PROBABILITY** of the impact by calculating the average between the Frequency of the Aspect, the Availability of a pathway to the receptor and the availability of the receptor.



Table 11: Determination of Magnitude of impact

Score	SOURCE				RECEPTOR	
	Duration of impact	Extent	Volume / Quantity / Intensity	Toxicity / Destruction Effect	Reversibility	Sensitivity of environmental component
1	Lasting days to a month	Effect limited to the site. (metres);	Very small quantities / volumes / intensity (e.g. < 50L or < 1Ha)	Non-toxic (e.g. water) / Very low potential to create damage or destruction to the environment	Bio-physical and/or social functions and/or processes will remain unaltered.	Current environmental component(s) are largely disturbed from the natural state. Receptor of low significance / sensitivity
2	Lasting 1 month to 1 year	Effect limited to the activity and its immediate surroundings. (tens of metres)	Small quantities / volumes / intensity (e.g. 50L to 210L or 1Ha to 5Ha)	Slightly toxic / Harmful (e.g. diluted brine) / Low potential to create damage or destruction to the environment	Bio-physical and/or social functions and/or processes might be negligibly altered or enhanced / Still reversible	Current environmental component(s) are moderately disturbed from the natural state. No environmentally sensitive components.
3	Lasting 1 – 5 years	Impacts on extended area beyond site boundary (hundreds of metres)	Moderate quantities / volumes / intensity (e.g. > 210 L < 5000L or 5 – 8Ha)	Moderately toxic (e.g. slimes) Potential to create damage or destruction to the environment	Bio-physical and/or social functions and/or processes might be notably altered or enhanced / Partially reversible	Current environmental component(s) are a mix of disturbed and undisturbed areas. Area with some environmental sensitivity (scarce / valuable environment etc.).
4	Lasting 5 years to Life of Organisation	Impact on local scale / adjacent sites (km's)	Very large quantities / volumes / intensity (e.g. 5000 L –	Toxic (e.g. diesel & Sodium Hydroxide)	Bio-physical and/or social functions and/or processes might be considerably	Current environmental component(s) are in a natural state.



Score	SOURCE				RECEPTOR	
	Duration of impact	Extent	Volume / Quantity / Intensity	Toxicity / Destruction Effect	Reversibility	Sensitivity of environmental component
			10 000L or 8Ha–12Ha)		altered or enhanced / potentially irreversible	Environmentally sensitive environment / receptor (endangered species / habitats etc.).
5	Beyond life of Organisation / Permanent impacts	Extends widely (nationally or globally)	Very large quantities / volumes / intensity (e.g. > 10 000 L or > 12Ha)	Highly toxic (e.g. arsenic or TCE)	Bio-physical and/or social functions and/or processes might be severely/substantially altered or enhanced / Irreversible	Current environmental component(s) are in a pristine natural state. Highly Sensitive area (endangered species, protected habitats etc.)

*Step 2: Determine the **MAGNITUDE** of the impact by calculating the average of the factors above.*



Table 12: Determination of Severity of impact

ENVIRONMENTAL IMPACT RATING / PRIORITY					
SEVERITY	MAGNITUDE				
PROBABILITY	1 Minor	2 Low	3 Medium	4 High	5 Major
5 Almost Certain	Low	Medium	High	High	High
4 Likely	Low	Medium	High	High	High
3 Possible	Low	Medium	Medium	High	High
2 Unlikely	Low	Low	Medium	Medium	High
1 Rare	Low	Low	Low	Medium	Medium

Step 3: Determine the SEVERITY of the impact by plotting the averages that were obtained above for Probability and Magnitude



5. Risk assessment

The aim of this section of this Risk Assessment Report is to provide information regarding the potential environmental impacts associated with the proposed activities. In compiling the impact assessment tables, technical input was obtained from the various specialists, with copies of these reports attached to the draft EIR

5.1 Geology

Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)			
	Probability	Magnitude	Severity					Probability	Magnitude	Severity	
ENVIRONMENTAL COMPONENT: Geology											
ACTIVITY: The underground deep level mining of gold bearing ore.											
APPLICABLE ALTERNATIVE:											
<ul style="list-style-type: none"> Schedule alternative 											
PROJECT PHASE APPLICABILITY	Planning and Design		X								
	Construction										
	Operation		X								
	Decommissioning and Closure		X								
	Post Closure										
<p><u>Impact description:</u> The underground deep level mining requires the blasting and removal of rock in the further sinking of the shafts as well as for the extraction of narrow generally flat dipping gold reefs. This, including the removal of the ore to the surface for processing at the Nicolor South Plant will lead to the permanent destruction of the localised geological strata.</p> <p>An alternatives in terms of scheduling has been identified and is applicable to this alternative. In the commencement of mining at all of the shafts simultaneously (schedule alternative) the impact is likely to have the same severity as the proposed activity although the destruction of the geology will occur over a shorter timeframe. This is due to the fact that the impact will be permanent in nature and is an inevitable consequence of mining.</p> <p><u>Extent of impact:</u> The extent of the impact will be limited to the areas within the Mining Rights boundary area.</p> <p><u>Duration of impact:</u> The impact will be permanent in nature.</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> High degree with permanent destruction to the geological sequence.</p>	To minimise the destruction of the geological strata and to prevent the unnecessary loss of geology.	<p><u>Degree to which impact can be reversed:</u> The impact is irreversible and is an inevitable consequence of mining.</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> The underground mining activities will be limited to within the Mining Rights boundary area and only to what is required in the mine plan. The correct stoping width should be maintained. 	<p>Planning / Commissioning / Operational Phase</p> <p>Planning / Commissioning / Operational Phase</p>	Environmental Manager and Mine Manager							
<u>Proposed activity</u>	5	3	H						5	3	H
<u>Schedule alternative:</u> Mining at all of the shafts simultaneously.	5	3	H						5	3	H



5.2 Soil

5.2.1 Soil contamination

Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)													
	Probability	Magnitude	Severity					Probability	Magnitude	Severity											
ENVIRONMENTAL COMPONENT: Soil																					
ACTIVITY: Commencement mining activities at within the various shaft areas.																					
APPLICABLE ALTERNATIVE:																					
<ul style="list-style-type: none"> Schedule alternative Process alternative 																					
<table border="1"> <thead> <tr> <th rowspan="5">PROJECT PHASE APPLICABILITY</th> <th>Planning and Design</th> <th>X</th> </tr> </thead> <tbody> <tr> <th>Construction</th> <td></td> </tr> <tr> <th>Operation</th> <th>X</th> </tr> <tr> <th>Decommissioning and Closure</th> <th>X</th> </tr> <tr> <th>Post Closure</th> <td></td> </tr> </tbody> </table>											PROJECT PHASE APPLICABILITY	Planning and Design	X	Construction		Operation	X	Decommissioning and Closure	X	Post Closure	
PROJECT PHASE APPLICABILITY	Planning and Design	X																			
	Construction																				
	Operation	X																			
	Decommissioning and Closure	X																			
	Post Closure																				
<p><u>Impact description:</u> Although the majority of the shaft areas are lined with cement, there are areas within and adjacent to the shaft boundary which comprise of natural vegetation and secondary grasslands. The soil within these areas may therefore be negatively impacted upon should any mining related activities be conducted on these areas (refer also to Part 5.4).</p> <p>In commencing with mining at all of the shafts at once (schedule alternative), it is likely that the magnitude of the impacts will be cumulatively greater as compared the proposed activity. The overall cumulative impact will also likely occur over a shorter timeframe in the event of the implementation of the scheduling alternative.</p> <p>An alternative in terms of processing has been identified and involves the construction, utilisation and management of a new processing plant. Additional impacts in terms the following aspects may occur:</p> <ul style="list-style-type: none"> Topography, Soil. Land use and capability (location dependent). Flora (location dependent). Fauna (location dependent). Surface water. Groundwater. Sensitive landscapes (location dependent). Sites of cultural and archaeological importance (location dependent). Air quality. Noise. 				<p>To prevent the loss of soil and soil fertility during the mining and mining activities.</p>		<p><u>Degree to which impact can be reversed:</u> Low to medium degree of reversibility.</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> Prevent the release of contaminated surface water runoff. Demarcate all areas, within the shaft surface areas, in which no unauthorised activities should take place. All spillages identified should be cleaned and remediated as soon as possible. In the event of spill of hydrocarbon material: <ul style="list-style-type: none"> The activity will be ceased. The spill will be contained immediately. All contaminated soil will be removed and disposed of as hazardous waste. The site of the spill will be rehabilitated. 			<p>Commissioning / Operational / Closure Phase</p> <p>Planning / Commissioning Phase</p> <p>Commissioning / Operational / Closure Phase</p>		<p>Environmental manager</p>										



Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
<ul style="list-style-type: none"> Visual. Socio-economic. <p>Depending on the proposed location of a new processing plant and related infrastructure (i.e. plant infrastructure, Tailings Storage Facility, sumps/dams), should the alternative be implemented, soil may be impacted upon. It is important to note that should the process alternative be implemented, additional specialist studies as well as impact assessments should be undertaken and further authorisations should be sought from the competent authorities (including the possible amendment of the approved EMP).</p> <p><u>Extent of impact:</u> The extent will be local in nature.</p> <p><u>Duration of impact:</u> The duration will be long term for the LoM (approximately 10 years).</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> low degree of irreplaceable loss</p>										
<u>Proposed activity</u>	3	2	M					2	2	L
<u>Schedule alternative:</u> Mining at all of the shafts simultaneously.	3	3	M					2	2	L
<u>Process alternative:</u> Construction and utilisation of a new processing plant	5	4	H					5	4	H
ACTIVITY: Hydrocarbon, chemical and waste materials spillages										
<p><u>Impact description:</u> Hydrocarbon and chemical spills may pollute soils within the area either through direct contact or indirectly through the contamination of surface water runoff. Similarly unsorted and improper storage of general waste, building rubble or equipment contaminated with radioactive material may contaminate soil either through direct contact or indirectly through the contamination of surface water runoff.</p> <p>In commencing with mining at all of the shafts at once (schedule alternative), it is likely that the magnitude of the impacts will be cumulatively greater as compared the proposed activity.</p> <p><u>Extent of impact:</u> The extent will be local in nature.</p> <p><u>Duration of impact:</u> The duration will be long term.</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> low degree of irreplaceable loss.</p>	To prevent the loss of soil and soil fertility during the mining and mining activities.	<p><u>Degree to which impact can be reversed:</u> Low to medium degree of reversibility.</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> Prevent the release of contaminated surface water runoff. Demarcate all areas, within the shaft surface areas, in which no unauthorised activities should take place. All spillages identified should be cleaned and remediated as soon as possible. In the event of spill of hydrocarbon material: <ul style="list-style-type: none"> The activity will be ceased. The spill will be contained immediately. All contaminated soil will be removed and disposed of as hazardous waste. The disturbed area will then be rehabilitated 	Operational / Closure Phase Planning / Commissioning Phase Commissioning / Operational / Closure Phase	Environmental manager						



Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
					<ul style="list-style-type: none"> The Emergency Preparedness and Response Procedure as well as other related Standard Operating Procedures (SOPs) will be implemented prior to the commencement of mining and mining related activities. All hydrocarbon and chemical substances should be stored in lined, bunded and demarcated areas. All vehicles, equipment and machinery will be serviced on a regular basis. Spill kits will be readily available across all shaft areas 	Planning Phase Commissioning / Operational / Closure Phase Commissioning / Operational / Closure Phase Commissioning / Operational / Closure Phase				
Proposed activity	3	2	M					2	2	L
Schedule alternative: Mining at all of the shafts simultaneously.	3	3	M					2	2	L

5.2.2 Soil erosion

Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
ENVIRONMENTAL COMPONENT: Soil										
ACTIVITY: Decommissioning of the shafts and related infrastructure and rehabilitation of the disturbed footprint areas.										
APPLICABLE ALTERNATIVE:										
<ul style="list-style-type: none"> Schedule alternative Process alternative 										
PROJECT PHASE APPLICABILITY	Planning and Design									
	Construction									
	Operation									
	Decommissioning and Closure	X								
	Post Closure	X								



Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
<p><u>Impact description:</u> The decommissioning of the shafts and removal of infrastructure will result in the exposure of soil to the elements, resulting in erosion of the soil. This will not only impact on the fertility of the soil but may have an impact on the surface water quality, fauna and flora and sensitive landscapes.</p> <p>In commencing with mining at all of the shafts at once (schedule alternative), all shaft areas will therefore be decommissioned and the disturbed area rehabilitated simultaneously. It is likely that the magnitude of the impact will be cumulatively greater as compared the proposed activity. The overall cumulative impact will also likely occur over a shorter timeframe in the event of the implementation of the scheduling alternative.</p> <p>An alternative in terms of processing has been identified and involves the construction, utilisation and management of a new processing plant (refer also to the description as provided in Part 5.2.1 above). Depending on the proposed location of a new processing plant and related infrastructure (i.e. plant infrastructure, Tailings Storage Facility, sumps/dams), should the alternative be implemented, soil may be impacted upon. It is important to note that should the process alternative be implemented, additional specialist studies as well as impact assessments should be undertaken and further authorisations should be sought from the competent authorities (including the possible amendment of the approved EMP).</p> <p><u>Extent of impact:</u> The impact will be limited to site and directly adjacent areas.</p> <p><u>Duration of impact:</u> The duration will be long term.</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> Medium degree of irreplaceable loss</p>				To prevent the loss of soil and soil fertility during decommissioning and rehabilitation activities.	<p><u>Degree to which impact can be reversed:</u> Moderate degree of reversibility.</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> All previously disturbed areas are to be rehabilitated and re-vegetated. All rehabilitated areas should be monitored on a regular basis to ensure that no erosion is occurring, until such a time that rehabilitation is complete and the agreed upon end land use achieved. The declared weed and alien invader management plan should continue to be implemented during the rehabilitation phase. 	Closure Phase Closure and Post-closure Phase Closure / Post-closure Phase	Environmental manager			
<u>Proposed activity</u>	3	3	M					2	2	L
<u>Schedule alternative:</u> Mining at all of the shafts simultaneously.	3	4	M					2	2	L
<u>Process alternative:</u> Construction and utilisation of a new processing plant	5	4	H					5	4	H

5.3 Land use and capability

Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
ENVIRONMENTAL COMPONENT: Land use and land capability										



Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)			
	Probability	Magnitude	Severity					Probability	Magnitude	Severity	
ACTIVITY: Decommissioning and rehabilitation of all shaft areas and closure of the mine.											
APPLICABLE ALTERNATIVE:											
<ul style="list-style-type: none"> Process alternative 											
PROJECT PHASE APPLICABILITY	Planning and Design										
	Construction										
	Operation										
	Decommissioning and Closure	X									
	Post Closure	X									
<p><u>Impact description:</u> It is important to note that the CAPM Orkney Gold Mine is an existing gold mine and has previously been operational. Therefore, it is not anticipated that the re-commencement of the mining activities will have a further impact on the land use and land capability. However, during decommissioning and closure, all unnecessary infrastructure will be demolished and the surface area rehabilitated to the agreed upon end land use. Therefore, a positive impact may be experienced as the land use may change from mining to agriculture or wilderness.</p> <p>An alternative in terms of processing has been identified and involves the construction, utilisation and management of a new processing plant (refer also to the description as provided in Part 5.2.1 above). Depending on the proposed location of a new processing plant and related infrastructure (i.e. plant infrastructure, Tailings Storage Facility, sumps/dams), should the alternative be implemented, soil may be impacted upon. It is important to note that should the process alternative be implemented, additional specialist studies as well as impact assessments should be undertaken and further authorisations should be sought from the competent authorities (including the possible amendment of the approved EMPr).</p> <p><u>Extent of impact:</u> The positive impact will be limited to site and possibly the local area.</p> <p><u>Duration of impact:</u> The positive impact will be long-term to permanent.</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> Not applicable</p>				To restore the land use and land capability to the agreed upon end land use, taking the recommendations of the DMR and municipalities into account.		<p><u>Degree to which impact can be reversed:</u> Positive impact is to be enhanced and has a high degree of reversibility</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> The positive impact should be enhanced by rehabilitating as much of the disturbed surface area as possible, depending on the agreed upon end land use and taking the DMR and the municipalities requirements into account. 			Closure Phase	Environmental Manager	
<u>Proposed activity</u>				Positive			Positive				
<u>Process alternative:</u> Construction and utilisation of a new processing plant				5	4	H	5			4	H



5.4 Flora¹

5.4.1 Protected species and species of conservation concern

Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)													
	Probability	Magnitude	Severity					Probability	Magnitude	Severity											
ENVIRONMENTAL COMPONENT: Vegetation																					
ACTIVITY: Operational and care and maintenance activities to be conducted at the No.6 and No.7 Shafts and the No.1 to No.5 Shafts, respectively.																					
APPLICABLE ALTERNATIVE:																					
<ul style="list-style-type: none"> Process alternative 																					
<table border="1"> <thead> <tr> <th rowspan="5">PROJECT PHASE APPLICABILITY</th> <th>Planning and Design</th> <th></th> </tr> </thead> <tbody> <tr> <td>Construction</td> <td></td> </tr> <tr> <td>Operation</td> <td>X</td> </tr> <tr> <td>Decommissioning and Closure</td> <td>X</td> </tr> <tr> <td>Post Closure</td> <td>X</td> </tr> </tbody> </table>											PROJECT PHASE APPLICABILITY	Planning and Design		Construction		Operation	X	Decommissioning and Closure	X	Post Closure	X
PROJECT PHASE APPLICABILITY	Planning and Design																				
	Construction																				
	Operation	X																			
	Decommissioning and Closure	X																			
	Post Closure	X																			
<p><u>Impact description:</u> <i>Boophone disticha</i> is a plant species with a conservation status of "Declining". The habitat of this plant species is dry grasslands and rocky areas and is widespread in South Africa and extends up the eastern half of southern Africa to Uganda. This plant species was identified within the untransformed grassland areas adjacent to the No.7 Shaft. It was also identified that <i>Pearsonia bracteata</i> and <i>Drimia sanguinea</i> could also occur in this area owing to the presence of the suitable habitat. No mining activities will be conducted outside of the underground Mining Right area or the Surface Rights area of the shaft, therefore it is not anticipated that the proposed mining activity at the No.7 Shaft will impact on these species. However, in the event that any activities are conducted outside of the shaft boundary area, these species may be impacted upon. Dust, generated from the loading and hauling of the ore, may also settle on the vegetation in this area and may impact on the growth, photosynthesis and transpiration processes of the vegetation.</p> <p>Only three species protected under Schedule 11 of the Transvaal Nature Conservation Act (No.12 of 1983), namely <i>Babiana hypogea</i>, <i>Gladiolus permeabilis</i> and <i>Crinum graminicola</i> were recorded from untransformed grassland (corresponding to shaft footprints No.4 and No.5) on the study area.</p> <p>An alternative in terms of processing has been identified and involves the construction, utilisation and management of a new processing plant (refer also to the description as provided in Part 5.2.1 above). Depending on the proposed location of a new processing plant and related infrastructure (i.e. plant infrastructure, Tailings Storage Facility, sumps/dams), should the alternative be implemented, vegetation may be impacted upon. It is important to note that should the process alternative be implemented, additional specialist studies as well as impact assessments should be undertaken and further authorisations should be sought from the competent authorities (including the possible amendment of the approved EMPr).</p>	Prevent the destruction of vegetation and subsequent impacts species of conservation concern and protected species.	<p><u>Degree to which impact can be reversed:</u> Medium degree of reversibility however significance of the impact is generally low.</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> The shaft areas will be fenced in to prevent unauthorised access. All areas within which activities can take place should be demarcated. Access control, to prevent unauthorised access to the secondary grassland areas, should be implemented. An air quality and dust fallout monitoring programme will be implemented All loaded haul trucks are to remain covered during the transportation. All machinery, vehicles and haul trucks should be inspected and serviced on a regular basis. Implement good housekeeping practices to limit the generation of dirty areas with the No.7 Shaft area. 	<p>Planning Phase</p> <p>Planning Phase</p> <p>Planning Phase</p> <p>Operational Phase</p> <p>Operational Phase</p> <p>Operational / Closure Phase</p> <p>Operational / Closure Phase</p>	Environmental manager																	

¹ Note: The impacts, significance and respective mitigation measure were obtained from the baseline botanical and faunal biodiversity survey. Refer also to Annexure C3 of the EIA / EMPr document.



Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
<p><u>Extent of impact:</u> The impact will be limited to site and the immediately adjacent areas.</p> <p><u>Duration of impact:</u> Long term for the Life of Mine</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> Low degree of irreplaceable loss.</p>					<ul style="list-style-type: none"> It is recommended that protected plants in danger of becoming destroyed during any of the planned activities be removed (rescued) prior to the commencement of Commissioning activities and trans-located to transformed or degraded habitat of potentially suitable habitat within the study area, or used during the rehabilitation phase. A permit would be required to remove or disturb the protected plant species. 	Planning / Commissioning Phase Planning / Commissioning Phase				
<u>Proposed activity</u>	2	2	L					1	2	L
<u>Process alternative:</u> Construction and utilisation of a new processing plant	5	4	H					5	4	H

5.4.2 Areas of ecological sensitivity

5.4.2.1 No.1 Shaft and No.2 Shaft

Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
ENVIRONMENTAL COMPONENT: Vegetation										
ACTIVITY: Operational and care and maintenance activities to be conducted at the No.6 and No.7 Shafts and the No.1 to No.5 Shafts, respectively.										
PROJECT PHASE APPLICABILITY	Planning and Design									
	Construction									
	Operation		X							
	Decommissioning and Closure		X							
	Post Closure		X							
<p><u>No.1 Shaft</u></p> <p>Approximately 85% of the total surface area of the No.1 Shaft is transformed by infrastructure and built-up land cover with the remaining 15% consisting of secondary grassland. The secondary grassland unit consists of two grassland communities and cumulatively occupies an area of 1.13 ha. The vegetation unit is dominated by grasses with a low forb diversity. These two communities have been classified according to sensitivity with one community having a low sensitivity and one having a medium-to-low sensitivity.</p>				Prevent the destruction of vegetation and subsequent impacts species of conservation concern and protected species.	<p><u>Degree to which impact can be reversed:</u> Medium degree of reversibility however significance of the impact is generally low.</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> The shaft areas will be fenced in to prevent unauthorised access. 		Environmental manager			



Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
<p><u>No.2 Shaft</u> Approximately 14% of the No.2 Shaft footprint area consists of secondary grass and the remainder 86% consists of infrastructure. 4.01 ha of the shaft footprint area consists of secondary grassland and comprises of two discrete grassland communities. The two communities are characterised by a grassland sere consisting of secondary and pioneer graminoid taxa. The vegetation is primarily dominated by graminoid species, and forb richness is low. These two communities have been classified according to sensitivity with one community having a low sensitivity and one having a medium-to-low sensitivity.</p> <p><u>Impact description:</u> The secondary grassland communities across the two shaft areas may be impacted upon as a result of the care and maintenance activities and possible future mining related activities conducted on site. These grasslands may also be susceptible to receiving contaminated surface water runoff from the site areas.</p> <p>In commencing with mining at all of the shafts at once (schedule alternative), it is likely that the magnitude of the impacts will be cumulatively greater as compared the proposed activity.</p> <p><u>Extent of impact:</u> The impact will be limited to the sites.</p> <p><u>Duration of impact:</u> The impact will be long term for the Life of Mine.</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> The impact will result in low to moderate degree of irreplaceable loss</p>					<ul style="list-style-type: none"> All areas within which activities can take place should be demarcated. Access control, to prevent unauthorised access to the secondary grassland areas, should be implemented. An air quality and dust fallout monitoring programme will be implemented. All loaded haul trucks are to remain covered during the transportation. All machinery, vehicles and haul trucks should be inspected and serviced on a regular basis. It is recommended that protected plants in danger of becoming destroyed during any of the planned activities be removed (rescued) prior to the commencement of Commissioning activities and trans-located to transformed or degraded habitat of potentially suitable habitat within the study area, or used during the rehabilitation phase 	Planning / Commissioning Phase Planning / Commissioning Phase Planning / Commissioning Phase Commissioning / Operational / Closure Phase Operational Phase Commissioning / Operational / Closure Phase Planning / Commissioning Phase				
<u>Proposed activity</u>	2	3	M					1	2	L
<u>Schedule alternative</u>	3	3	M					1	2	L



5.4.2.2 No.3 Shaft

Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)			
	Probability	Magnitude	Severity					Probability	Magnitude	Severity	
ENVIRONMENTAL COMPONENT: Vegetation											
ACTIVITY: Operational and care and maintenance activities to be conducted at the No.6 and No.7 Shafts and the No.1 to No.5 Shafts, respectively.											
PROJECT PHASE APPLICABILITY	Planning and Design										
	Construction										
	Operation	X									
	Decommissioning and Closure	X									
	Post Closure	X									
<p><u>Impact description:</u> Approximately 1.03 ha or 14% of the shaft footprint area consists of secondary grassland and secondary hygophilous grassland. The western section of the shaft footprint consists of a "plagioclimax" of Hyparrhenia hirta, while the grassland on the eastern section is structurally interspersed by exotic (and naturalised) bush clumps. The southern section of the shaft footprint consists of a small artificial drainage line which periodically receives storm water from the nearby shaft complex. The moist conditions have facilitated the colonisation of facultative wetland plant taxa. These communities have been classified according to sensitivity with the eastern and western communities having a low sensitivity and southern community having a medium-to-low sensitivity.</p> <p>The secondary grassland communities as well as the secondary hygophilous grassland located at the No.3 Shaft may be impacted upon as a result of the care and maintenance activities and possible future mining related activities conducted on site. These grassland may also be susceptible to receiving contaminated surface water runoff from the site areas. It is however important to note that no mining activities will be conducted at the No.3 Shaft as the shaft area is currently in the process of being decommissioned and rehabilitated, that will result in a positive impact (refer also to 5.13.4).</p>	Prevent the destruction of vegetation and subsequent impacts species of conservation concern and protected species.	<p><u>Degree to which impact can be reversed:</u> Medium degree of reversibility however significance of the impact is generally low.</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> The shaft areas will be fenced in to prevent unauthorised access to the site and the rehabilitated areas. All areas within which decommissioning activities will take place should be demarcated. Access control, to prevent unauthorised access to the untransformed and secondary grassland areas, should be implemented. An air quality and dust fallout monitoring programme will continue to be implemented throughout the decommissioning and rehabilitation phase. All rehabilitated areas will be inspected on a regular basis (refer to Part 4.13.4 below). All decommissioning and rehabilitation machinery and vehicles should be inspected and serviced on a regular basis. 	Planning / Commissioning Phase Operational / Closure Phase Planning / Commissioning Phase Commissioning / Operational / Closure Phase Closure / Post-closure Closure Phase	Environmental manager							
<u>Proposed activity</u>	Positive										Positive



5.4.2.3 No.4 Shaft

Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
ENVIRONMENTAL COMPONENT: Vegetation										
ACTIVITY: Operational and care and maintenance activities to be conducted at the No.6 and No.7 Shafts and the No.1 to No.5 Shafts, respectively.										
PROJECT PHASE APPLICABILITY	Planning and Design									
	Construction									
	Operation	X								
	Decommissioning and Closure	X								
	Post Closure	X								
<p><u>Impact description:</u> Approximately 70% of the shaft footprint area is transformed by infrastructure, approximately 6% constitutes secondary grassland and approximately 24% constitutes untransformed grassland. The untransformed grassland has a high richness value for both graminoid and forb species and shows high affinities to an open Themeda triandra - Indigofera heterotricha grassland alliance. The untransformed grassland unit provides habitat for two plant species of conservation concern (Pearsonia bracteata and Drimia sanguinea) and therefore has a high ecological sensitivity. The untransformed grassland unit as well as the secondary grassland unit may be impacted upon as a result of the care and maintenance activities as well as the future mining related activities to be conducted on site. These grasslands may also be susceptible to receiving contaminated surface water runoff from the site areas.</p> <p><u>Extent of impact:</u> The impact will be limited to the site.</p> <p><u>Duration of impact:</u> The impact will be long term for the Life of Mine.</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> The impact will result in low to moderate degree of irreplaceable loss</p>	Prevent the destruction of vegetation and subsequent impacts species of conservation concern and protected species.	<p><u>Degree to which impact can be reversed:</u> Medium degree of reversibility however significance of the impact is generally low.</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> The shaft areas will be fenced in to prevent unauthorised access. All areas within which activities can take place should be demarcated. Access control, to prevent unauthorised access to the secondary grassland areas, should be implemented. An air quality and dust fallout monitoring programme will be implemented All loaded haul trucks are to remain covered during the transportation. All machinery, vehicles and haul trucks should be inspected and serviced on a regular basis. It is recommended that protected plants in danger of becoming destroyed during any of the planned activities be removed (rescued) prior to the commencement of Commissioning activities and trans-located to transformed or degraded habitat of potentially 	Planning / Commissioning Phase Operational / Closure Phase Planning / Commissioning Phase Commissioning / Operational / Closure Phase Operational / Closure Phase Operational / Closure Phase Commissioning / Operational / Closure Phase	Environmental manager						



Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)			
	Probability	Magnitude	Severity					Probability	Magnitude	Severity	
					suitable habitat within the study area, or used during the rehabilitation phase <ul style="list-style-type: none"> In the event that the untransformed grassland area is disturbed, a permit would be required to remove or disturb the protected plant species. This should be done under the supervision of a suitably qualified person. 	Commissioning / Operational / Closure Phase					
Proposed activity	3	3	M					2	2	L	

5.4.2.3 No.5 Shaft

Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
ENVIRONMENTAL COMPONENT: Vegetation										
ACTIVITY: Operational and care and maintenance activities to be conducted at the No.6 and No.7 Shafts and the No.1 to No.5 Shafts, respectively.										
PROJECT PHASE APPLICABILITY	Planning and Design									
	Construction									
	Operation			X						
	Decommissioning and Closure			X						
	Post Closure			X						
<p><u>Impact description:</u> Approximately 3% of the shaft consists of an agricultural mosaic, 10% consists of secondary grasslands, a further 10% consists of untransformed grassland and the remaining 77% has been transformed by infrastructure.</p> <p>The agricultural mosaics constitutes 1.29 ha and has a low ecological sensitivity and is rapidly colonised by agrestal weeds.</p> <p>The untransformed grassland unit occupies an area of approximately 4 ha and has a medium-high ecological sensitivity.</p> <p>The secondary grassland unit occupies an approximate area of 4 ha and has a low ecological sensitivity.</p> <p>It is however important to note that the No.5 Shaft is currently under care maintenance. However decommissioning and rehabilitation activities have been conducted in the past and will continue to be</p>	Prevent the destruction of vegetation and subsequent impacts species of conservation concern and protected species.	<p><u>Degree to which impact can be reversed:</u> Medium degree of reversibility however significance of the impact is generally low.</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> The shaft areas will be fenced in to prevent unauthorised access to the site and the rehabilitated areas. All areas within which decommissioning activities will take place should be demarcated. 	Planning / Commissioning / Operational / Closure Phase Operational / Closure Phase	Environmental manager						



Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
conducted in the future. A positive impact will be experienced as the shaft area will be decommissioned and rehabilitated (refer also to Part 4.13.4 below).					<ul style="list-style-type: none"> Access control, to prevent unauthorised access to the untransformed and secondary grassland areas, should be implemented. An air quality and dust fallout monitoring programme will continue to be implemented throughout the decommissioning and rehabilitation phase. All rehabilitated areas will be inspected on a regular basis (refer to Part 4.13.4 below). All decommissioning and rehabilitation machinery and vehicles should be inspected and serviced on a regular basis. 	Planning / Commissioning Phase Closure Phase Closure / Post-closure Phase Closure Phase				
<u>Proposed activity</u>			Positive							Positive

5.4.2.4 No.7 Shaft

Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
ENVIRONMENTAL COMPONENT: Vegetation										
ACTIVITY: Operational and care and maintenance activities to be conducted at the No.6 and No.7 Shafts and the No.1 to No.5 Shafts, respectively.										
PROJECT PHASE APPLICABILITY	Planning and Design									
	Construction									
	Operation		X							
	Decommissioning and Closure		X							
	Post Closure		X							
<p><u>Impact description:</u> Approximately 85% of the shaft footprint is transformed by infrastructure with the remaining 15% consisting of secondary grasslands.</p> <p>The secondary grassland unit is characterised by severely degraded grassland and ruderal weed species among tall stands of Eucalyptus cf. camaldulensis*. The dominant plant species include Melinis repens, Enneapogon cenchroides and Tagetes minuta*. No 'species of conservation concern' was recorded from this unit. This unit comprises of degraded secondary vegetation confined to previously transformed habitats with a low species richness. Therefore, this unit has a low ecological sensitivity. It is worth mentioning that this unit</p>	Prevent the destruction of vegetation and subsequent impacts species of conservation concern and protected species.	<p><u>Degree to which impact can be reversed:</u> Medium degree of reversibility however significance of the impact is generally low.</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> The shaft areas will be fenced in to prevent unauthorised access to the site and the rehabilitated areas. 	Planning / Commissioning Phase	Environmental manager						



Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
is located in close proximity to untransformed grassland where declining species such as Boophone disticha and Hypoxis hemerocallidea were recorded. Therefore, it is imperative to prevent an overspill of construction and operational activities into areas consisting of untransformed grassland.					<ul style="list-style-type: none"> All areas within which decommissioning activities will take place should be demarcated. Access control, to prevent unauthorised access to the untransformed and secondary grassland areas, should be implemented. An air quality and dust fallout monitoring programme will continue to be implemented throughout the decommissioning and rehabilitation phase. All rehabilitated areas will be inspected on a regular basis (refer to Part 5.13.4 below). All decommissioning and rehabilitation machinery and vehicles should be inspected and serviced on a regular basis. 	Operational / Closure Phase Planning / Commissioning Phase Commissioning / Operational / Closure Phase Operational / Closure Phase Closure Phase				
<u>Proposed activity</u>	2	3	M					2	2	L

5.4.3 The establishment in declared weeds and invader species

Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
ENVIRONMENTAL COMPONENT: Vegetation										
ACTIVITY: Operational and care and maintenance activities to be conducted at the No.6 and No.7 Shafts and the No.1 to No.5 Shafts, respectively.										
PROJECT PHASE APPLICABILITY	Planning and Design									
	Construction									
	Operation			X						
	Decommissioning and Closure			X						
	Post Closure			X						
<u>Impact description:</u> A number of weeds and invader plant species were identified within the study area. These weeds and invader plant species established on disturbed areas have a tendency to dominate or replace the canopy herbaceous layer of natural ecosystems, thereby transforming the structure, composition and function of natural ecosystems.				Prevent the destruction of vegetation and subsequent impacts species of conservation	<u>Degree to which impact can be reversed:</u> Medium to high degree of reversibility. <u>Proposed mitigation:</u>		Environmental manager			



Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)			
	Probability	Magnitude	Severity					Probability	Magnitude	Severity	
<p><u>Extent of impact:</u> The impact is limited to site and the immediately adjacent areas.</p> <p><u>Duration of impact:</u> The impact will be long-term to permanent.</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> May cause a high degree of irreplaceable loss</p>				concern and protected species.	<ul style="list-style-type: none"> A weed and declared invader management plan will be implemented to monitor and remove all weeds and declared invaders identified on site. The weed and declared invader management plan should be continued with during the Decommissioning and Closure Phase and all of the rehabilitated areas should continue to be inspected to ensure the removal and management of weeds and declared invader plants. Areas of disturbance will be limited to only what is required within the mine plan and will be limited to the shaft footprint areas. 	Commissioning / Operational Phase Closure Phase Planning / Commissioning / Operational and Closure Phase					
<u>Proposed activity</u>	3	3	M					2	2	L	

5.5 Fauna²

5.5.1 Animal species of conservation concern

Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
ENVIRONMENTAL COMPONENT: Fauna										
ACTIVITY: Operational activities and care and maintenance activities to be conducted at the No.6 and No.7 Shafts and the No.1 to No.5 Shafts, respectively.										
APPLICABLE ALTERNATIVE:										
<ul style="list-style-type: none"> Schedule alternative 										
PROJECT PHASE APPLICABILITY	Planning and Design									
	Construction									
	Operation		X							

² Note: The impacts, significance and respective mitigation measure were obtained from the baseline botanical and faunal biodiversity survey. Refer also to Annexure C3 of the EIA / EMP document.



Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)			
	Probability	Magnitude	Severity					Probability	Magnitude	Severity	
	Decommissioning and Closure	X									
	Post Closure	X									
<p>Description: The study area provides potential habitat for 10 mammal taxa of conservation concern, of which, the following species may occur:</p> <ul style="list-style-type: none"> Brown Hyaena. Honey Badger. South African Hedgehog. Shrews. Black-footed cat. <p>Due to the increased human presence in the area and observation within the study area, both the Brown Hyaena and the Black-footed Cat are said to be irregular in occurrence within the study area. The Honey badger as well as the south African hedgehog are however expected to occur within the study area due to their tolerance to modified habitat types.</p> <p>The bird species of conservation concern are likely to occur within the study area and include:</p> <ul style="list-style-type: none"> The Melardious Lark (<i>Mirafra cheniana</i>). The near threatened Abdim's stork (<i>Ciconia abdimii</i>). The vulnerable Lanner Falcon (<i>Falco biarmicus</i>). <p>The Abdims Stork and the Lanner Falcon were not recorded during the site survey but are classified as likely to occur within the study area. The Melardious Lark was however recorded within the study area during the site survey. 23 other species are sympatric to the study area however they are either irregular visitors to the area or unlikely to be present due to the absence of suitable habitats.</p>											
<p>Impact description: Animals within the study area and adjacent to the mine may be hunted and poached, by employees and the members of the local community, for food.</p> <p>In commencing with mining at all of the shafts at once (schedule alternative), it is likely that the magnitude of the impacts will be cumulatively greater as compared the proposed activity.</p> <p>Extent of impact: The impact will be limited to site and immediately adjacent areas.</p> <p>Duration of impact: Long term for the Life of Mine.</p> <p>Degree to which impact will cause irreplaceable loss: May result in a high degree of irreplaceable loss of resources</p>	To minimise the destruction of faunal habitat and prevent fragmentation as far as possible.	<p>Degree to which impact can be reversed: Low degree of reversibility.</p> <p>Proposed mitigation:</p> <ul style="list-style-type: none"> All employees should be trained on the importance of the all aspects of the environment (including fauna and flora). No employees will be allowed to hunt or poach animals within or around the CAPM Orkney Gold Mine area. All shaft areas will be fenced to not only prevent unauthorized access but also to prevent animal life from entering the shaft areas. 	Commissioning / Operational / Closure Phase	Commissioning / Operational / Closure Phase	Commissioning / Operational Phase	Environmental Manager					
Proposed activity	3	2	M					1	2	L	
Schedule alternative	3	3	M					1	2	L	
<p>Impact description: Animal injury and / or death may result from animal life accessing the mine shaft areas as well as by collisions with vehicles and machinery on and off site.</p>											



Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
<p>In commencing with mining at all of the shafts at once (schedule alternative), it is likely that the magnitude of the impacts will be cumulatively greater as compared the proposed activity.</p> <p><u>Extent of impact:</u> The impact will be local in extent.</p> <p><u>Duration of impact:</u> The impact will be long term for the Life of Mine.</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> may result in a high degree of irreplaceable loss of resources.</p>					<ul style="list-style-type: none"> Mitigation measure in terms of noise, as stipulated in Part 5.10 below will implemented to prevent and minimize the effects of noise on animal life. 	Commissioning / Operational / Closure Phase				
<u>Proposed activity</u>	2	2	L					1	2	L
<u>Schedule alternative</u>	2	3	M					1	2	L
<p><u>Impact description:</u> Noise generated from mining activities may scare animal life in the vicinity and lead to migration away from the area and possibly even injury and death.</p> <p>In commencing with mining at all of the shafts at once (schedule alternative), it is likely that the magnitude of the impacts will be cumulatively greater as compared the proposed activity.</p> <p><u>Extent of impact:</u> The impact will be local in extent.</p> <p><u>Duration of impact:</u> The impact will be long term for the Life of Mine.</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> May result in a high degree of irreplaceable loss of resources.</p>										
<u>Proposed activity</u>	2	2	L					1	2	L
<u>Schedule alternative</u>	2	3	M					1	2	L



5.6 Surface water³

5.6.1 No.1 Shaft

Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
ENVIRONMENTAL COMPONENT: Surface water										
ACTIVITY: Operation of winder cooling ponds										
PROJECT PHASE APPLICABILITY	Planning and Design									
	Construction									
	Operation	X								
	Decommissioning and Closure									
	Post Closure									
<p><u>Impact description:</u> The winder cooling ponds are concrete ponds situated next to one of the winder houses and in close proximity of the clean runoff channels. These ponds contain process water used for cooling purposes.</p> <p>Surface water quality: Overflow of winder cooling ponds may lead to affected water discharge into the clean surface runoff channels situated next to the cooling ponds and may result in deterioration in quality of surface water runoff from the Shaft #1 area.</p> <p><u>Extent of impact:</u> Affect limited to the site</p> <p><u>Duration of impact:</u> Operational phase</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> Not applicable, due to low significance.</p>			To prevent quality deterioration of surface runoff generated and within the Shaft #1 area.	<p><u>Degree to which impact can be reversed:</u> Medium to high degree</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> An operational procedure should be implemented to maintain sufficient free-board and limit process water spillages into the clean water system. 	Operational Phase	Environmental Manager				
<u>Proposed activity</u>	4	1	L					2	1	L
ACTIVITY: Storage and handling of hydrocarbon containers										
PROJECT PHASE APPLICABILITY	Planning and Design									
	Construction									
	Operation	X								
	Decommissioning and Closure									
	Post Closure									
<p><u>Impact description:</u> Surface water contamination may take place as a result of leaking hydrocarbon containers stored outside of designated areas.</p> <p><u>Extent of impact:</u> Affect limited to site.</p>			To prevent quality deterioration of surface runoff generated and within the Shaft #1 area.	<p><u>Degree to which impact can be reversed:</u> Medium to high degree</p> <p><u>Proposed mitigation:</u></p>		Environmental Manager				

³ Note: The impacts, significance and respective mitigation measure were obtained from the conceptual Storm Water Management Plan Specialist Report. Refer also to Annexure C2 of the EIA / EMP document



Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
<p><u>Duration of impact:</u> Operational phase</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> Not applicable, due to low significance.</p>					<ul style="list-style-type: none"> Implement good house-keeping practises and implement a procedure for the storage and handling of hydrocarbon containers and spillages. Hydrocarbon containers should be stored within designated areas, preferably bunded and roofed. 	Care and maintenance / Operational Phase. Commissioning / Operational Phase				
<u>Proposed activity</u>	2	2	L ⁴					2	1	L
ACTIVITY: Containment of affected water										
PROJECT PHASE APPLICABILITY	Planning and Design									
	Construction									
	Operation	X								
	Decommissioning and Closure									
	Post Closure									
<p><u>Impact description:</u> Overflow from the containment sump underneath the conveyor system may lead to deterioration of clean surface water quality in the immediate vicinity of the Shaft #1 area.</p> <p><u>Extent of impact:</u> Affect limited to site.</p> <p><u>Duration of impact:</u> Operational phase</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> Not applicable, due to low significance.</p>				To prevent quality deterioration of surface runoff generated and within the Shaft #1 area.	<p><u>Degree to which impact can be reversed:</u> Medium to high degree</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> Implement regular inspections and a maintenance schedule to ensure pumping infrastructure is functional at all times to limit possible sump overflow. 	Operational Phase	Environmental Manager			
<u>Proposed activity</u>	2	2	L ⁵					1	1	L

4 Note: The impacts and their respective significance and mitigation measures were obtained from the conceptual Storm Water Management Plan Specialist Report. Refer also to Annexure C2 of the EIA / EMPr document.

5 Note: The impacts and their respective significance and mitigation measures were obtained from the conceptual Storm Water Management Plan Specialist Report. Refer also to Annexure C2 of the EIA / EMPr document.



5.6.2 No.2 Shaft

Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)			
	Probability	Magnitude	Severity					Probability	Magnitude	Severity	
ENVIRONMENTAL COMPONENT: Surface water											
ACTIVITY: Uncontrolled surface water runoff											
PROJECT PHASE APPLICABILITY	Planning and Design										
	Construction										
	Operation		X								
	Decommissioning and Closure										
	Post Closure										
<p><u>Impact description:</u> There are no current diversion measures to prevent surface runoff from flowing into Shaft #2. Runoff retention also takes place inside previously constructed containment facilities.</p> <p>Surface water quantity: Surface runoff ingress into the shaft and retention inside previously constructed containment facilities may lead to a decrease in catchment yield towards the Vaal River.</p> <p><u>Extent of impact:</u> Affect limited to the site.</p> <p><u>Duration of impact:</u> During care and maintenance/decommissioning.</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> Not applicable, due to low significance.</p>	To prevent a decrease in catchment yield towards the Vaal River.			<p><u>Degree to which impact can be reversed:</u> High degree of reversibility</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> Implement storm water diversion measures at the shaft area to prevent ingress of surface runoff into the shaft during heavy rainfall events. Areas where surface water retention takes place should be minimised to encourage free drainage of surface water towards the downstream environment. Obstructions within current storm water trenches should be removed to promote free drainage of the Shaft #2 area. 	Care and maintenance / Decommissioning Phase.	Commissioning / Operational Phase	Care and maintenance / Commissioning / Operational / Closure Phase.	Environmental Manager			
Proposed activity	4	2	M						1	1	L



5.6.3 No.3 Shaft

Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
ENVIRONMENTAL COMPONENT: Surface water										
ACTIVITY: Rehabilitation of the No.3 Shaft area										
PROJECT PHASE APPLICABILITY	Planning and Design									
	Construction									
	Operation									
	Decommissioning and Closure									
	Post Closure	X								
<p><u>Impact description:</u> Closure phase: Incorrect rehabilitation techniques may result in exposed areas and areas that will prevent drainage of storm water runoff towards the downstream environment.</p> <p>Surface water quantity and quality: Exposed areas within the Shaft #3 footprint may result in an increased sediment load that may deteriorate water quality towards the downstream environment. Incorrect rehabilitation techniques may result in ponding of storm water runoff and reduction in the catchment yield.</p> <p><u>Extent of impact:</u> Affect limited to the site.</p> <p><u>Duration of impact:</u> During care and maintenance/decommissioning.</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> Not applicable, due to low significance.</p>	To prevent a decrease in catchment yield towards the Vaal River.			<p><u>Degree to which impact can be reversed:</u> High degree of reversibility</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> It is imperative that the Shaft #3 area be rehabilitated to ensure free drainage of surface flow towards the downstream environment. Vegetation growth should be promoted to reduce the possibility of erosion of exposed areas. Obstructions within current storm water trenches should be removed to promote free drainage of the Shaft #3 area. 			Closure Phase. Closure / Post-closure Phase Closure Phase		Environmental Manager	
<u>Proposed activity</u>	2	1	L					1	1	L

5.6.4 No.4 Shaft

Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
ENVIRONMENTAL COMPONENT: Surface water										
ACTIVITY: Uncontrolled surface water runoff										
	Planning and Design									
	Construction									



Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)											
	Probability	Magnitude	Severity					Probability	Magnitude	Severity									
<table border="1"> <tr> <td>PROJECT PHASE APPLICABILITY</td> <td>Operation</td> <td>X</td> </tr> <tr> <td></td> <td>Decommissioning and Closure</td> <td></td> </tr> <tr> <td></td> <td>Post Closure</td> <td></td> </tr> </table>	PROJECT PHASE APPLICABILITY	Operation	X		Decommissioning and Closure			Post Closure											
PROJECT PHASE APPLICABILITY	Operation	X																	
	Decommissioning and Closure																		
	Post Closure																		
<p><u>Impact description:</u> There are no current diversion measures to prevent surface runoff from flowing into Shaft #4. Runoff retention also takes place inside previously constructed containment facilities within the shaft operations area.</p> <p>Surface water quantity: Surface runoff ingress into the shaft and retention inside previously constructed containment facilities may lead to a decrease in catchment yield.</p> <p><u>Extent of impact:</u> Affect limited to the site.</p> <p><u>Duration of impact:</u> During care and maintenance/operational phase.</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> Not applicable, due to low significance.</p>			To prevent a decrease in catchment yield towards the Vaal River.	<p><u>Degree to which impact can be reversed:</u> High degree of reversibility</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> Implement storm water diversion measures at the shaft area to prevent ingress of surface runoff into the shaft during heavy rainfall events. Areas where surface water retention takes place should be minimised to encourage free drainage of surface water towards the downstream environment. Obstructions within current storm water trenches should be removed to promote free drainage of the Shaft #4 area. 	Care and maintenance / Operational Phase Care and maintenance / Commissioning Phase Care and maintenance / Commissioning / Operational / Closure Phase	Environmental Manager													
Proposed activity	4	2	M					1	1	L									

5.6.5 No.5 Shaft

Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
ENVIRONMENTAL COMPONENT: Surface water										
ACTIVITY: Sewage management										
PROJECT PHASE APPLICABILITY	Planning and Design									
	Construction									
	Operation	X								
	Decommissioning and Closure									
	Post Closure									



Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
<p><u>Impact description:</u> A sewage sump is located next to a clean storm water diversion channel downstream of the Shaft #5 hostel area. Mine personnel has indicated that there were previous incidents in which the sump's capacity was reached and sewage entered the clean storm water conveyance channel.</p> <p>Surface water quality: Overflow of sewage into the clean storm water conveyance channel will result in significant deterioration of water quality.</p> <p><u>Extent of impact:</u> Impact may extend beyond site to adjacent sites.</p> <p><u>Duration of impact:</u> Operational phase of sewage system.</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> May result in irreplaceable loss to aquatic ecosystems if system not effectively managed.</p>				To prevent a decrease in surface water quality reporting to the downstream clean water environment.	<p><u>Degree to which impact can be reversed:</u> Low to medium degree of reversibility</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> Implement regular inspections and ensure that the sump is serviced on a daily basis. As an additional measure, construct a berm between the sewage sump and the clean storm water channel to prevent sewage from entering the channel during possible overflow. 	Operational Phase of hostel Operational Phase of hostel	Environmental Manager			
<u>Proposed activity</u>	4	3	H					2	2	L

5.6.6 No.6 Shaft

Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
ENVIRONMENTAL COMPONENT: Surface water										
ACTIVITY: Uncontrolled storm water runoff										
PROJECT PHASE APPLICABILITY	Planning and Design									
	Construction									
	Operation		X							
	Decommissioning and Closure									
	Post Closure									
<p><u>Impact description:</u> There are no current diversion measures to prevent surface runoff from flowing into Shaft #6.</p> <p>Surface water quantity:</p>				To prevent a decrease in catchment yield towards the downstream clean surface water environment.	<p><u>Degree to which impact can be reversed:</u> Low to medium degree of reversibility</p> <p><u>Proposed mitigation:</u></p>		Environmental Manager			



Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
<p>Surface runoff ingress into the shaft may lead to a decrease in catchment yield towards the clean water environment.</p> <p><u>Extent of impact:</u> limited to the site</p> <p><u>Duration of impact:</u> During care and maintenance / operational phase</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> Not applicable, due to low significance.</p>					<ul style="list-style-type: none"> Implement storm water diversion measures at the shaft area to prevent ingress of surface runoff into the shaft during heavy rainfall events. Areas where surface water retention takes place should be minimised to encourage free drainage of surface water towards the downstream environment. Obstructions within current storm water trenches should be removed to promote free drainage of the Shaft #6 area. 	Commissioning / Operational phase Commissioning / Operational phase Commissioning / Operational / Closure Phase				
Proposed activity	4	2	M					1	1	L
ACTIVITY: Wash bay operation										
PROJECT PHASE APPLICABILITY	Planning and Design									
	Construction									
	Operation		X							
	Decommissioning and Closure									
	Post Closure									
<p><u>Impact description</u> The wash bay will be used as a designated area to clean equipment and currently not fitted with an oil separator. This facility is not connected to a dirty water system and therefore wash water is pumped out and discharged into the adjacent veldt during operations.</p> <p>Surface water quality: Should any wash water be discharged from the wash bay in its current status, discharge of hydrocarbon contaminated water will take place in the surrounding clean water environment.</p> <p><u>Extent of impact:</u> Affect limited to the site and immediate surroundings.</p> <p><u>Duration of impact:</u> During operational phase</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> Hydrocarbon contaminated discharge may pollute the receptor to such a degree that bio-physical and social functions might be considerably altered.</p>				To prevent discharge of hydrocarbon contaminated wash water into the clean water environment.	<p><u>Degree to which impact can be reversed:</u> Low to medium degree of reversibility</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> Implement an oil separator system at the wash bay to lower the hydrocarbon content of wash water to be discharged into the clean environment. Regular inspections should be conducted to ensure that the oil separator is in working order at all times. Conduct regular monitoring of discharge of wash water to comply with the DWS general limit standards for discharge. Obstructions within current storm water trenches should be removed to promote free drainage of the Shaft #6 area. 	Commissioning Phase Commissioning / Operational / Closure Phase Commissioning / Operational / Closure Phase Commissioning / Operational / Closure Phase	Environmental Manager			
Proposed activity	5	3	H					4	2	M



5.6.7 No.7 Shaft

Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)			
	Probability	Magnitude	Severity					Probability	Magnitude	Severity	
ENVIRONMENTAL COMPONENT: Surface water											
ACTIVITY: Chemical and hydrocarbon management											
PROJECT PHASE APPLICABILITY	Planning and Design										
	Construction										
	Operation	X									
	Decommissioning and Closure										
	Post Closure										
<p><u>Impact description:</u> The main storm water channel is located next to a hydrocarbon and chemical storage area. Any chemical and hydrocarbon containers as well as equipment (operated using grease) stored outside of a designated area creates a risk of surface water pollution. Contaminated runoff as a result of poor housekeeping practises will enter the clean storm water diversion trench towards the adjacent veldt area.</p> <p>Surface water quality: The quality of surface runoff generated within the Shaft #7 area may be deteriorated as a result of contact with hydrocarbons such as oil and grease.</p> <p><u>Extent of impact:</u> Affect limited to the site and immediate surroundings.</p> <p><u>Duration of impact:</u> During operational phase.</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> Low significance as a result of receptor of low sensitivity due to disturbed state.</p>				To prevent a decrease in surface water quality generated and discharged from the Shaft #7 area.	<p><u>Degree to which impact can be reversed:</u> Low to medium degree of reversibility</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> Implement good housekeeping practises to limit the generation of dirty areas with the Shaft #7 area. 	Commissioning / Operational / Closure Phase	Environmental Manager				
Proposed activity	3	2	M						1	2	L
ACTIVITY: Wash bay operation											
PROJECT PHASE APPLICABILITY	Planning and Design										
	Construction										
	Operation	X									
	Decommissioning and Closure										
	Post Closure										
<p><u>Impact description:</u> The wash bay will be used as a designated area to clean radio-active contaminated equipment. This facility is connected to a dirty water system and wash water is pumped to the adjacent plant and used as part of the process water system. Should an incident occur, radio-active wash water may be discharged towards the clean storm water channel.</p> <p>Surface water quality: Discharge of contaminated water from the wash bay at Shaft #7 may lead to a significant deterioration of surface water quality towards the downstream clean water environment.</p>				To prevent discharge of radio-active contaminated wash water into the clean water environment.	<p><u>Degree to which impact can be reversed:</u> Low to medium degree of reversibility</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> Construct containment walls around the wash bay as a measure to contain possible overflow from the sump. 	Commissioning / Operational phase	Environmental Manager				



Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)			
	Probability	Magnitude	Severity					Probability	Magnitude	Severity	
<p><u>Extent of impact:</u> Affect limited to the site and immediate surroundings.</p> <p><u>Duration of impact:</u> During operational phase.</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> Not applicable, due to low significance of receptor.</p>					<ul style="list-style-type: none"> Implement regular inspections and a maintenance schedule to ensure that pumping infrastructure is in working order during operations. 	Commissioning / Operational / Closure Phase					
<u>Proposed activity</u>	3	3	M					1	3	L	
ACTIVITY: Sump operation underneath conveyor											
PROJECT PHASE APPLICABILITY	Planning and Design										
	Construction		X								
	Operation		X								
	Decommissioning and Closure										
	Post Closure										
<p><u>Impact description:</u> A sump has been constructed underneath the conveyor system next to Shaft #7. The purpose of this sump is to contain any seepage from the damp ore material hoisted from underground. This sump is fitted with pumping infrastructure towards the adjacent plant as part of the process water system. There is a risk that overflow into the main storm water channel might occur as a result of pump failure.</p> <p>Surface water quality: Discharge of contaminated water from the sump may result in deterioration of clean surface water runoff towards the adjacent clean water environment.</p> <p><u>Extent of impact:</u> Affect limited to the site and immediate surroundings.</p> <p><u>Duration of impact:</u> During operational phase.</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> Not applicable, due to low significance of receptor.</p>				To prevent discharge of contaminated water into the clean water environment.	<p><u>Degree to which impact can be reversed:</u> Low to medium degree of reversibility</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> Implement regular inspections and a maintenance schedule to ensure that pumping infrastructure is in working order during operations. 	Commissioning / Operational Phase	Environmental Manager				
<u>Proposed activity</u>	3	2	M					2	2	L	



5.7 Groundwater

Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)					
	Probability	Magnitude	Severity					Probability	Magnitude	Severity			
ENVIRONMENTAL COMPONENT: Groundwater Quantity and quality													
ACTIVITY: Dewatering of the shafts for the safe continuation of mining.													
PROJECT PHASE APPLICABILITY	Planning and Design												
	Construction												
	Operation	X											
	Decommissioning and Closure	X											
	Post Closure												
<p><u>Impact description:</u> During the operational phase groundwater will be dewatered to the bottom of the Vaal Contact Reef which will result in dewatering of the surrounding aquifer. However, the transient modelling exercise showed that the cone of depression is limited in extent with no boreholes included within its influence zone.</p> <p><u>Extent of impact:</u> Impacts on extended area beyond site boundary (hundreds of metres)</p> <p><u>Duration of impact:</u> Lasting 1 – 5 years</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> Medium to high degree.</p>				To minimise the extent of disturbance of the aquifer	<p><u>Degree to which impact can be reversed:</u> Medium degree of reversibility</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> Intercept drainage around the shaft. The dewatering of the aquifer system cannot be prevented. If the monitoring program indicates that nearby groundwater users are affected by the dewatering, the users need to be compensated for the loss. 	Commissioning / Operational Phase Commissioning and Operational Phase	Environmental Manager						
Proposed activity	3	2	M								3	2	M
ACTIVITY: The underground deep level mining of gold bearing ore, including the associated activities conducted on the surface.													
PROJECT PHASE APPLICABILITY	Planning and Design												
	Construction	X											
	Operation	X											
	Decommissioning and Closure	X											
	Post Closure												
<p><u>Impact description:</u> The impacts on groundwater quality are primarily related to the management of materials, wastes and spills from drilling operations and unauthorised disposal of contaminated substances. Contamination of groundwater may also arise due to incorrect handling and disposal of waste materials, the physical drilling process (sludge contains oils and greases) and oil leaks from drill rigs. This risk is considered low. Groundwater quality impacts may also arise from seepage from the recycle dam underground, although this is considered a low impact since the dam will be lined. The general risk towards groundwater quality deterioration is considered low.</p> <p><u>Extent of impact:</u> Impacts on extended area beyond site boundary (hundreds of metres)</p>				To minimise the extent of disturbance of the aquifer deterioration of groundwater quality.	<p><u>Degree to which impact can be reversed:</u> Medium degree of reversibility</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> During the operational phase appropriate temporary stormwater infrastructure must be developed and implemented, in accordance to Regulation 704. Prevent or contain contamination from spilling and oil leaks from vehicles, equipment and drill rigs. 	Commissioning / Operational Phase	Environmental Manager						



Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)													
	Probability	Magnitude	Severity					Probability	Magnitude	Severity											
<p><u>Duration of impact:</u> Lasting 1 – 5 years</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> Medium to high degree.</p>					<ul style="list-style-type: none"> Commissioning activity management should ensure that any materials handling does not pose a material risk to soil, surface water and groundwater pollution. 	Commissioning / Operational / Closure Phase Commissioning Phase															
<u>Proposed activity</u>	3	2	M					3	2	M											
ACTIVITY: Decommissioning and closure of the underground workings, shafts and associated infrastructure and well as the shaft surface area.																					
PROJECT PHASE APPLICABILITY	<table border="1"> <tr><td>Planning and Design</td><td></td></tr> <tr><td>Construction</td><td></td></tr> <tr><td>Operation</td><td>X</td></tr> <tr><td>Decommissioning and Closure</td><td>X</td></tr> <tr><td>Post Closure</td><td>X</td></tr> </table>			Planning and Design		Construction		Operation	X	Decommissioning and Closure	X	Post Closure	X								
Planning and Design																					
Construction																					
Operation	X																				
Decommissioning and Closure	X																				
Post Closure	X																				
<p><u>Impact description:</u> During the closure phases when all pumping within the region has ceased, the water in the shaft/s may rise towards the Environmentally Critical Level (ECL) where, if contaminated and affected by AMD reactions, may pollute aquifers or surface drainages. The rate at which, and up to which point the water will rise is highly complex and unknown given the multitude of parameters and dewatering schemes within the KOSH area. However previous studies in the KOSH area indicate a likely probability of decant and rise to pre-mining conditions and the ECL. However, at the CAPM 7 Shaft the groundwater table is not expected to return to pre - mining conditions. The reason being that decant will occur at 40 Level, creating a permanent dewatering cone towards 4 Shaft. The quality of the decant water is expected to be contaminated but will improve over time as existing areas of exposed sulphide mineralisation are flooded or oxidised.</p> <p><u>Extent of impact:</u> Impact on local scale / adjacent sites (km's).</p> <p><u>Duration of impact:</u> Beyond life of Organization / Permanent impacts.</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> High degree.</p>				To minimise the extent of disturbance of the aquifer and deterioration of groundwater quality.	<p><u>Degree to which impact can be reversed:</u> Medium degree of reversibility</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> A long-term goal may entail the establishment of a joint water management strategy with mines in the region and possible treatment capacity. Reduce water inflow into shafts through efficient stormwater management. Water levels within the basins should be held at or below the relevant environmental critical levels (ECLs) through pumping of water. Improved monitoring of mine water, groundwater, surface water, subsidence and other geotechnical impacts of mine flooding and seismicity is required. 	Operational / Closure / Post-closure Phase Commissioning / Operational Phase Closure / Post-closure Phase Commissioning / Operational / Closure / Post-closure Phase	Environmental Manager														
<u>Proposed activity</u>	3	5	H					3	2	M											



5.8 Sensitive Landscapes

Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
ENVIRONMENTAL COMPONENT: Sensitive landscapes										
ACTIVITY: Mining and mining related activities conducted within the shaft areas.										
PROJECT PHASE APPLICABILITY	Planning and Design									
	Construction									
	Operation		X							
	Decommissioning and Closure		X							
	Post Closure									
<p><u>Impact description:</u> An assessment was conducted against the NFEPA classified wetlands and the proximity of these wetlands to the CAPM Orkney Gold Mine shaft areas. As described in Chapter H of Part 7.4.1 (Part A – Environmental Impact Assessment) of the EIA and EMPr, three (3) NFEPA classified wetland areas have been identified to be in close proximity to the No.2 Shaft (unchannelled valley bottom wetland), the No.3 Shaft (channelled Valley Bottom Wetland) and the No.4 Shaft (flat wetland area). The operational activities to be conducted within the vicinity of shaft areas may impact on these wetland areas in terms of surface water quality, fauna, flora and soil aspects (refer also to Part 4.2, Part 4.5, Part 4.6 and Part 4.7). It is however important to note that these shafts are not currently operational as the No.7 and No.6 Shaft will be the first shafts to commence with operations and operations at the No.3 Shaft will not commence as the No.3 Shaft area is in the process of being rehabilitated.</p> <p><u>Extent of impact:</u> The impact will be limited to the wetland areas directly adjacent to the above mentioned shafts. The impact will therefore be local in extent.</p> <p><u>Duration of impact:</u> The duration of the impact will be long-term for the Life of Mine.</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> The may impact may result in a medium degree of irreplaceable loss of resources.</p>	Prevent the discharge of contaminated surface water runoff and to prevent the degradation of sensitive landscapes (including wetland areas).	<p><u>Degree to which impact can be reversed:</u> The impact has a medium degree of reversibility.</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> No.2 Shaft: <ul style="list-style-type: none"> Implement storm water diversion measures at the shaft area to prevent ingress of surface runoff into the shaft during heavy rainfall events. Areas where surface water retention takes place should be minimised to encourage free drainage of surface water towards the downstream environment. Obstructions within current storm water trenches should be removed to promote free drainage of the No.2 Shaft area. No.3 Shaft: <ul style="list-style-type: none"> It is imperative that the No.3 Shaft area be rehabilitated to ensure free drainage of surface flow towards the downstream environment. Vegetation growth should be promoted to reduce the possibility of erosion of exposed areas. Obstructions within current storm water trenches should be removed to promote free drainage of the Shaft #3 area. No.4 Shaft: <ul style="list-style-type: none"> Implement storm water diversion measures at the shaft area to prevent ingress of surface runoff into the shaft during heavy rainfall events. Areas where surface water retention takes place should be minimised to encourage free drainage of surface water towards the downstream environment. 	<p>Commissioning / Operational Phase</p> <p>Closure Phase</p> <p>Commissioning / Operational Phase</p>	Environmental Manager						



Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)			
	Probability	Magnitude	Severity					Probability	Magnitude	Severity	
					<ul style="list-style-type: none"> Obstructions within current storm water trenches should be removed to promote free drainage of the Shaft #4 area. Prior to the commencement of operations at the No.2 Shaft and the No.4 Shaft, a wetland delineation and Impact Assessment should be conducted to accurately delineate any wetlands within the vicinity, determine the Present Ecological Status (PES) and the Ecological Importance and Sensitivity (EIS) of the wetlands, to determine the potential impacts that may occur and to present possible mitigation measures for these impacts. 	Planning / Commissioning Phase					
Proposed activity	2	3	M					2	2	L	

5.9 Air quality

5.9.1 Fans (Kanana Vent Duct, Veld fan, Orkney fan)

Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)													
	Probability	Magnitude	Severity					Probability	Magnitude	Severity											
ENVIRONMENTAL COMPONENT: Air quality																					
ACTIVITY: The operation and utilization of the fans to remove stale air from the underground working.																					
<table border="1"> <tr> <td rowspan="5">PROJECT PHASE APPLICABILITY</td> <td>Planning and Design</td> <td></td> </tr> <tr> <td>Construction</td> <td></td> </tr> <tr> <td>Operation</td> <td>X</td> </tr> <tr> <td>Decommissioning and Closure</td> <td></td> </tr> <tr> <td>Post Closure</td> <td></td> </tr> </table>											PROJECT PHASE APPLICABILITY	Planning and Design		Construction		Operation	X	Decommissioning and Closure		Post Closure	
PROJECT PHASE APPLICABILITY	Planning and Design																				
	Construction																				
	Operation	X																			
	Decommissioning and Closure																				
	Post Closure																				
<p><u>Impact description:</u> The operation and utilisation of the Kanana Vent Duct, No 6 Shaft Veld Fan and the No 7 Shaft Main Fan may result in the release of potentially harmful pollutants and emissions into the air, from the underground workings. This may potentially affect the health of the residents in the area.</p> <p><u>Extent of impact:</u> The impact will be limited to the areas immediately adjacent to the various fans but may extend to local in nature</p> <p><u>Duration of impact:</u> The impact may be long term for the LoM (approximately 10 years).</p>	Prevent the deterioration of air quality and indirect effects on floral, faunal and human health	<p><u>Degree to which impact can be reversed:</u> Low to medium degree of reversibility.</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> An air quality monitoring programme should be implemented to determine the quality of the air being released from the fans. This will also aid in determining the necessity for an Air Emissions Licence in terms of the National Environmental Management: Air 	Operational Phase	Environmental Manager																	



Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)			
	Probability	Magnitude	Severity					Probability	Magnitude	Severity	
Degree to which impact will cause irreplaceable loss: Medium to High degree.					Quality Act, 2004 (Act No. 39 of 2004). Should it be found that potentially harmful emissions are being released from the fans, operations of the fans should cease and the appropriate actions taken.						
Proposed activity	3	4	H					3	3	M	

5.9.2 Haul trucks

Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)																	
	Probability	Magnitude	Severity					Probability	Magnitude	Severity															
ENVIRONMENTAL COMPONENT: Air quality																									
ACTIVITY: Hauling of mined ore to the Nicolor South Plant.																									
APPLICABLE ALTERNATIVE:																									
<ul style="list-style-type: none"> Schedule alternative 																									
<table border="1"> <thead> <tr> <th>PROJECT PHASE APPLICABILITY</th> <th>Planning and Design</th> <th></th> </tr> </thead> <tbody> <tr> <td></td> <td>Construction</td> <td></td> </tr> <tr> <td></td> <td>Operation</td> <td>X</td> </tr> <tr> <td></td> <td>Decommissioning and Closure</td> <td></td> </tr> <tr> <td></td> <td>Post Closure</td> <td></td> </tr> </tbody> </table>											PROJECT PHASE APPLICABILITY	Planning and Design			Construction			Operation	X		Decommissioning and Closure			Post Closure	
PROJECT PHASE APPLICABILITY	Planning and Design																								
	Construction																								
	Operation	X																							
	Decommissioning and Closure																								
	Post Closure																								
<p><u>Impact description:</u> As described above, the ore mined at the CAPM Orkney Gold Mine will be transported, via haulage trucks, to the Nicolor South Plant for processing utilising the formal road network. The transportation of the ore may therefore result in the generation dust that may have an impact on the local air quality.</p> <p>As described above in Part 4.2, decommissioning and rehabilitation activities will lead to exposure of bare soil to the elements and may result in wind erosion of the soil, affecting air quality in the vicinity.</p> <p>In commencing with mining at all of the shafts at once (schedule alternative), it is likely that the magnitude of the impacts will be cumulatively greater as compared the proposed activity. The overall cumulative impact will also likely occur over a shorter timeframe in the event of the implementation of the scheduling alternative.</p> <p><u>Extent of impact:</u> Local in extent</p>				Prevent the deterioration of air quality and indirect effects on floral, faunal and human health		<p><u>Degree to which impact can be reversed:</u> Low to medium degree of reversibility.</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> All loaded haul trucks are to remain covered during the transportation. All machinery, vehicles and haul trucks should be inspected and serviced on a regular basis. 		Operational Phase Operational / Closure Phase	Environmental Manager																



Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
<p><u>Duration of impact:</u> The impact may be long term for the LoM (approximately 10 years).</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> Low to medium degree.</p>				<ul style="list-style-type: none"> An air quality and dust fallout monitoring programme will be implemented and will be continued through the Decommissioning and Rehabilitation Phases. Rehabilitated areas will be inspected on a regular basis for evidence of erosion and should erosion occur, the appropriate actions will be taken. The declared weed and invader plant management plan will continue to be implemented during the Decommissioning and Rehabilitation Phase. 	Operational / Closure Phase					
<u>Proposed activity</u>	3	2	M		Closure Phase		2	2	L	
<u>Schedule Alternative</u>	3	3	M		Closure Phase		2	2	L	
<p><u>Impact description:</u> As described above, the ore mined at the CAPM Orkney Gold Mine will be transported, via haulage trucks, to the Nicolor South Plant for processing utilising the formal road network. Emissions from the haulage trucks may have a minor impact on the localised air quality.</p> <p>In commencing with mining at all of the shafts at once (schedule alternative), it is likely that the magnitude of the impacts will be cumulatively greater as compared the proposed activity. The overall cumulative impact will also likely occur over a shorter timeframe in the event of the implementation of the scheduling alternative.</p> <p><u>Extent of impact:</u> Local in extent</p> <p><u>Duration of impact:</u> The impact may be long term for the LoM (approximately 10 years).</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> Low degree.</p>										
<u>Proposed activity</u>	2	2	L				1	2	L	
<u>Schedule alternative</u>	2	3	M				1	2	L	

5.10 Noise⁶

Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
ENVIRONMENTAL COMPONENT: Noise										

⁶ Note: The impacts, significance and respective mitigation measure were obtained from the environmental noise impact assessment report. Refer also to Annexure C5 of the EIA / EMP document.



Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)													
	Probability	Magnitude	Severity					Probability	Magnitude	Severity											
ACTIVITY: The reinstatement of operations at the CAPM Orkney Gold Mine No.7 Shaft and No.6.																					
APPLICABLE ALTERNATIVE:																					
<ul style="list-style-type: none"> Schedule alternative Process alternative 																					
<table border="1"> <thead> <tr> <th rowspan="5">PROJECT PHASE APPLICABILITY</th> <th>Planning and Design</th> <th></th> </tr> </thead> <tbody> <tr> <th>Construction</th> <th></th> </tr> <tr> <th>Operation</th> <th>X</th> </tr> <tr> <th>Decommissioning and Closure</th> <th></th> </tr> <tr> <th>Post Closure</th> <th></th> </tr> </tbody> </table>											PROJECT PHASE APPLICABILITY	Planning and Design		Construction		Operation	X	Decommissioning and Closure		Post Closure	
PROJECT PHASE APPLICABILITY	Planning and Design																				
	Construction																				
	Operation	X																			
	Decommissioning and Closure																				
	Post Closure																				
<p><u>Impact description:</u> Currently the shafts are not producing and the noise levels are from normal background noise and activities originating from human interaction and vehicle. In the not too distant future these shafts will be re-opened and the prepared for production. This will include activities such as pumping of water and replacing structures that are worn and damaged. Through this process there will be a great deal of workshop and Commissioning activities and vehicle movement while the shafts and underground workings are prepared. Once operational again the main noise sources will be from the main surface fans and the normal shaft noises.</p> <p>In commencing with mining at all of the shafts at once (schedule alternative), all shaft areas will therefore be decommissioned and the disturbed area rehabilitated simultaneously. It is likely that the magnitude of the impact will be cumulatively greater as compared the proposed activity. The overall cumulative impact will also likely occur over a shorter timeframe in the event of the implementation of the scheduling alternative.</p> <p>An alternative in terms of processing has been identified and involves the construction, utilisation and management of a new processing plant (refer also to the description as provided in Part 5.2.1 above). Depending on the proposed location of a new processing plant and related infrastructure (i.e. plant infrastructure, Tailings Storage Facility, sumps/dams), should the alternative be implemented, noise levels are likely to increase. It is important to note that should the process alternative be implemented, additional specialist studies as well as impact assessments should be undertaken and further authorisations should be sought from the competent authorities (including the possible amendment of the approved EMPr).</p> <p><u>Extent of impact:</u> The impact will be local in extent.</p> <p><u>Duration of impact:</u> The impacts experienced during the preparation phase will be for short term however the impacts experienced during the full production will be long term for the Life of Mine.</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> No irreplaceable loss of resources.</p>			<p>Prevent and mitigate against the effects of noise on sensitive receptors (including employees and surrounding communities and towns).</p>		<p><u>Degree to which impact can be reversed:</u> Judging by the baseline levels that were measured and presented in the main body of this report, the mentioned activities should not be significant. The impact during the Commissioning phase will lessen as the Commissioning is complete and normal mining proceed. Historical data has shown that the noise levels generated through the normal mining activities are in general below the statutory requirements.</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> Effective maintenance of the vehicle engines and exhaust systems. Hearing conservation programme as per DMR guidelines on Noise Control. Zoning of high noise areas. The use of approved hearing protection devices for personnel working in close proximity of the workings. Incorporate sound attenuation measures to any equipment that could generate noise levels in excess of the statutory limits as published by the Department of Mineral and Energy. 			<p>Commissioning / Operational / Closure Phase</p> <p>Commissioning / Operational / Closure Phase</p> <p>Commissioning Phase</p> <p>Commissioning / Operational / Closure Phase</p> <p>Commissioning / Operational / Closure Phase</p>	<p>Environmental manager and the Health and safety Officer</p>												



Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)														
	Probability	Magnitude	Severity					Probability	Magnitude	Severity												
					<ul style="list-style-type: none"> From an occupational perspective the mine workers should be protected through standards and procedures and the personal exposure levels should be monitored as part of the legal requirements of Section 12 of the MHSA. 	Planning / Commissioning / Operational / Closure / Post-closure Phase																
<u>Proposed activity</u>	3	2	M					2	2	L												
<u>Schedule alternative</u>	3	3	M					2	2	L												
<u>Process alternative</u>	5	4	H					5	4	H												
ACTIVITY: The care and maintenance of the No.1 to No.5 shafts until such a time that they are prepared from operations or decommissioned and rehabilitated.																						
APPLICABLE ALTERNATIVE:																						
<ul style="list-style-type: none"> Schedule alternative 																						
<table border="1"> <thead> <tr> <th rowspan="5">PROJECT PHASE APPLICABILITY</th> <th>Planning and Design</th> <th></th> </tr> </thead> <tbody> <tr> <td>Construction</td> <td></td> </tr> <tr> <td>Operation</td> <td>X</td> </tr> <tr> <td>Decommissioning and Closure</td> <td></td> </tr> <tr> <td>Post Closure</td> <td></td> </tr> </tbody> </table>												PROJECT PHASE APPLICABILITY	Planning and Design		Construction		Operation	X	Decommissioning and Closure		Post Closure	
PROJECT PHASE APPLICABILITY	Planning and Design																					
	Construction																					
	Operation	X																				
	Decommissioning and Closure																					
	Post Closure																					
<p><u>Impact description:</u> These shaft will not be re-opened again for production. Normal care and maintenance will be carried on these shafts. Should there be any additional activities carried out, such as the breaking down of shaft structures and buildings, the noise levels should be monitored and the necessary control measures be introduced to minimise the impact on the community. Should operations commence at these shafts, the impacts as described above will apply.</p> <p>In commencing with mining at all of the shafts at once (schedule alternative), all shaft areas will therefore be decommissioned and the disturbed area rehabilitated simultaneously. It is likely that the magnitude of the impact will be cumulatively greater as compared the proposed activity. The overall cumulative impact will also likely occur over a shorter timeframe in the event of the implementation of the scheduling alternative.</p> <p><u>Extent of impact:</u> The impact will be limited to site but may become local in extent should decommissioning or rehabilitation activities be conducted.</p> <p><u>Duration of impact:</u> The duration of the impact will be long term until such a time that the shaft areas are decommissioned or rehabilitated or operations commence at these shafts.</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> No irreplaceable loss of resources.</p>				Prevent and mitigate against the effects of noise on sensitive receptors (including employees and the surrounding environment, communities and towns).		<p><u>Degree to which impact can be reversed:</u> There should be no significant impact, provided that the planned care and maintenance of these shafts are not deviated from.</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> Effective maintenance of the vehicle engines and exhaust systems. Hearing conservation programme as per DMR guidelines on Noise Control. Zoning of high noise areas. The use of approved hearing protection devices for personnel working in close proximity of the workings. 		Commissioning / Operational / Closure Phase Commissioning / Operational / Closure Phase Commissioning Phase Commissioning / Operational / Closure Phase		Environmental manager and the Health and safety Officer												



Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
					<ul style="list-style-type: none"> Incorporate sound attenuation measures to any equipment that could generate noise levels in excess of the statutory limits as published by the Department of Mineral and Energy. From an occupational perspective the mine workers should be protected through standards and procedures and the personal exposure levels should be monitored as part of the legal requirements of Section 12 of the MHSA. 	Commissioning / Operational / Closure Phase Planning / Commissioning / Operational / Closure / Post-closure Phase				
Proposed activity	1	1	L					1	1	L
Schedule alternative	3	3	M					2	2	L

5.11 Visual aspects

Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
ENVIRONMENTAL COMPONENT: Visual										
ACTIVITY: The reinstatement of operations at the CAPM Orkney Gold Mine Shaft areas.										
APPLICABLE ALTERNATIVE:										
<ul style="list-style-type: none"> Schedule alternative Process alternative 										



Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)													
	Probability	Magnitude	Severity					Probability	Magnitude	Severity											
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PROJECT PHASE APPLICABILITY		Planning and Design																			
		Construction																			
		Operation	X																		
		Decommissioning and Closure																			
	Post Closure																				
<p><u>Impact description:</u> Although the CAPM Orkney Gold Mine is an existing mine and the community and regular visitors of the area are likely to be desensitised to the mining related infrastructure, the mine has been under care and maintenance since the year 2010. Therefore, once operations at the shafts commence, the increased traffic and presence of employees as well as the increased generation of dust and emissions clouds from the machinery and vehicles may cause a visual disturbance. There are several sensitive receptors in both the foreground and middle ground that include residential areas and the town of Orkney.</p> <p>In commencing with mining at all of the shafts at once (schedule alternative), mining at all shaft areas will commence simultaneously. It is therefore likely that the magnitude of the impact will be cumulatively greater as compared the proposed activity due to the greater number of employees required, increased traffic around all of the shafts, increased number of haul trucks transporting mined ore to the Nicolor South Plant and a possible increase in dust generation. The overall cumulative impact will also likely occur over a shorter timeframe in the event of the implementation of the scheduling alternative.</p> <p>An alternative in terms of processing has been identified and involves the construction, utilisation and management of a new processing plant (refer also to the description as provided in Part 5.2.1 above). Depending on the proposed location of a new processing plant and related infrastructure (i.e. plant infrastructure, Tailings Storage Facility, sumps/dams), should the alternative be implemented, a significant impact on visual aspects is likely to occur. It is important to note that should the process alternative be implemented, additional specialist studies as well as impact assessments should be undertaken and further authorisations should be sought from the competent authorities (including the possible amendment of the approved EMPPr).</p> <p><u>Extent of impact:</u> The extent is limited to local area.</p> <p><u>Duration of impact:</u> Long-term for the Life of Mine (approximately 10 years).</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> Low degree</p>	Prevent visual intrusions on sensitive receptors			Degree to which impact can be reversed: Reversible	<p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> Implement the mitigation measures to limit the generation of dust, as described in Part 5.9 above. Limit activities to the operating hours of the mine. Transportation via haul trucks should only take place on roads as designated by the mine. Artificial lighting on masts should be directed towards the infrastructure and / or towards the ground to prevent the visual disturbance on adjacent landowners and communities. 	Commissioning / Operational / Closure Phase	Environmental manager														
<u>Proposed activity</u>	3	2	M					2	2	L											
<u>Schedule alternative</u>	3	3	M					2	2	L											
<u>Process alternative</u>	5	4	H					5	4	H											



5.12 Sites of archaeological and cultural importance⁷

5.12.1 No.3 Shaft

Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)			
	Probability	Magnitude	Severity					Probability	Magnitude	Severity	
ENVIRONMENTAL COMPONENT: Site of cultural and archaeological importance											
ACTIVITY: The decommissioning and removal of infrastructure and the rehabilitation of the surface area of the No.3 Shaft.											
PROJECT PHASE APPLICABILITY	Planning and Design										
	Construction										
	Operation	X									
	Decommissioning and Closure										
	Post Closure										
<p><u>Impact description:</u> This site with traditional riveted steel headgear is dated to the end of the 1930's. CAPM Orkney Gold Mine removed all infrastructure (including the headgear) at the No.3 Shaft, without being in possession of a demolition permit. This site was demolished between the period of 2011 and 2015. The site is protected by section 34 (1) of Act 25 of 1999, and is rated as "General protection" A (Field Rating IV A) by the SAHRA minimum standards May 2007, therefore cannot be altered or destructed without a demolition permit issued by the relevant heritage authorities.</p> <p><u>Extent of impact:</u> The extent of demolition was limited to site but may have an impact on a National Scale due to the infrastructure (Including headgear) being classified as a National Heritage Resources.</p> <p><u>Duration of impact:</u> Permanent</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> High degree as the site has been demolished and cannot be replaced.</p>	Re-assess the impact and identify the mitigation process to be followed	<p><u>Degree to which impact can be reversed:</u> The impact cannot be reversed.</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> The Heritage authorities should be approached to evaluate the impact and to provide the appropriate mitigation procedures to be followed. 	Planning Phase	Environmental Manager							
<u>Proposed activity</u>	High										Unknown at present

⁷ Note: The impacts, significance and respective mitigation measure were obtained from the cultural heritage impact assessment report. Refer also to Annexure C6 of the EIA / EMPr document



5.12.2 No.7 Shaft

Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
ENVIRONMENTAL COMPONENT: Site of cultural and archaeological importance										
ACTIVITY: The decommissioning and removal of infrastructure workshops at the No.7 Shaft.										
PROJECT PHASE APPLICABILITY	Planning and Design									
	Construction									
	Operation									
	Decommissioning and Closure	X								
	Post Closure									
<p><u>Impact description:</u> This site with traditional riveted steel headgear is dated to the mid 1930's. It is possibly the most representative of the early period of mining in the region. Even so it reflects alterations and updating over time. Most of the site is still intact. The mining objectives of CAPM Gold states that the site will mainly be retained as-is. It will be maintained in its present format allowing for and according to modern mining safety regulations. Furthermore five historic building were identified and includes four steel framed and corrugated iron clad workshops and one brick walled, workshop with wooden trusses and corrugated iron roof. All five buildings are protected by section 34(1) of the National Heritage Act, Act 25 of 1999. These are all rated as "General protection" A (Field Rating IV A) by the SAHRA minimum standards May 2007, therefore cannot be altered or demolished without a demolition permit issued by the relevant heritage authorities.</p> <p><u>Extent of impact:</u> The extent of demolition will be limited to site but may have an impact on a National Scale due to the infrastructure (Including headgear) being classified as a National Heritage Resources.</p> <p><u>Duration of impact:</u> Permanent</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> High degree as the five workshops will be demolished and cannot be replaced.</p>	Prevent the destruction of National Heritage Resources	Degree to which impact can be reversed: Impact can be mitigated according to National Heritage Act, Act 25 of 1999.	Proposed mitigation: <ul style="list-style-type: none"> Proposed impact must be mitigated by application for demolition permit/s 	Planning Phase	Environmental Manager					
<u>Proposed activity</u>	Medium							No Risk if proper procedures are applied and demolition permits are obtained		



5.13 Socio-economic aspects

5.13.1 Employment

Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)																	
	Probability	Magnitude	Severity					Probability	Magnitude	Severity															
ENVIRONMENTAL COMPONENT: Socio-economic																									
APPLICABLE ALTERNATIVE:																									
<ul style="list-style-type: none"> Schedule alternative Process alternative 																									
ACTIVITY: The commencement of operations at the No.6 and the No.7 Shafts.																									
<table border="1"> <thead> <tr> <th>PROJECT PHASE APPLICABILITY</th> <th>Planning and Design</th> <th></th> </tr> </thead> <tbody> <tr> <td></td> <td>Construction</td> <td></td> </tr> <tr> <td></td> <td>Operation</td> <td>X</td> </tr> <tr> <td></td> <td>Decommissioning and Closure</td> <td></td> </tr> <tr> <td></td> <td>Post Closure</td> <td></td> </tr> </tbody> </table>											PROJECT PHASE APPLICABILITY	Planning and Design			Construction			Operation	X		Decommissioning and Closure			Post Closure	
PROJECT PHASE APPLICABILITY	Planning and Design																								
	Construction																								
	Operation	X																							
	Decommissioning and Closure																								
	Post Closure																								
<p><u>Impact description:</u> As described in the SLP (attached to the EIA and EMPr as Annexure G), upon commencement of operations at the No.7 and the No.6 Shaft the CAPM Orkney Gold Mine will employ 471 individuals of which the majority (a minimum of 95%) will be sourced from the local communities. This is a positive impact in terms of socio-economic aspects as not only will 471 individuals be employed but the community will also benefit indirectly through the increased spending on goods and services, the use of local sub-contractors, as well as leading to a decrease in unemployment of the area.</p> <p>In commencing with mining at all of the shafts at once (schedule alternative), mining at all shaft areas will commence simultaneously and therefore a greater number of employees will be required.</p> <p>An alternative in terms of processing has been identified and involves the construction, utilisation and management of a new processing plant (refer also to the description as provided in Part 5.2.1 above). This alternative will lead to a greater number of employees required. It is however important to note that should the process alternative be implemented, additional specialist studies as well as impact assessments should be undertaken and further authorisations should be sought from the competent authorities (including the possible amendment of the approved EMPr).</p> <p><u>Extent of impact:</u> the impact will initially be local in extent but will benefit the regional and national economy.</p> <p><u>Duration of impact:</u> The positive impact will be experienced over a long-term, for the Life of Mine.</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> Not applicable as the positive impact will benefit the economy.</p>				<p>Enhance the positive impact on the socio-economic aspects.</p>		<p><u>Degree to which impact can be reversed:</u> The impact has a high degree of reversibility however it is not applicable as the positive impact should be enhanced</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> As many skilled and unskilled workers, as possible, should be sourced from the local communities, towns and surrounding areas. 		<p>Commissioning / Operational Phase</p>	<p>Environmental Manager and HR Department</p>																
Proposed activity				Positive						Positive															



Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
Schedule alternative	Positive							Positive		
Process alternative	Positive							Positive		
ACTIVITY: Mine closure.										
PROJECT PHASE APPLICABILITY	Planning and Design									
	Construction									
	Operation									
	Decommissioning and Closure	X								
	Post Closure	X								
<p><u>Impact description:</u> At the end of the Operational Phase of the Orkney Gold Mine, mining operations will cease and the mine will prepare for decommissioning and closure. Rehabilitation activities will commence, depending on the agreed upon end land, and infrastructure will be removed. During this phase a loss of jobs will occur as the amount of employees required during the Operational Phase will no longer be required.</p> <p><u>Extent of impact:</u> The impact will affect the local and regional socio-economic aspects and have an impact on a national scale</p> <p><u>Duration of impact:</u> The impact will be permanent in nature as operations will cease as the mine prepares for closure.</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> High degree, in terms of socio-economic aspects.</p>	To mitigate against the effects of job loss.			<p><u>Degree to which impact can be reversed:</u> None to low degree of reversibility.</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> Several mitigations against the effects of job loss have been provided for in the CAPM Orkney Gold Mines SLP (attached to the EIA and EMPr as Annexure G), and include the following: <ul style="list-style-type: none"> Education. Training. Skills development and training (portable skills, core business skills). Mentorships. Learnerships. Bursaries (internal and external). 	Operational / Closure Phase	Environmental Manager and HR Department				
Proposed activity	5	4	H					5	3	H

5.13.2 Influx of job seekers to the area

Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
ENVIRONMENTAL COMPONENT: Socio-economic										
ACTIVITY: The commencement of operations at the No.6 and the No.7 Shafts and eventually the No.4 Shaft and No.1 Shaft.										
PROJECT PHASE APPLICABILITY	Planning and Design									
	Construction									
	Operation		X							
	Decommissioning and Closure	X								
	Post Closure									



Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
<p><u>Impact description:</u> The commencement of operations at the CAPM Orkney Gold Mine may lead to an influx of job seekers to the area. As stipulated in the SLP of the mine, the mine will employ 471 individuals, of which the majority (a minimum of 95%) will be sourced from the local community. The influx of job seekers to the area may result in several social impacts due to the limited job supply and includes:</p> <ul style="list-style-type: none"> • An increase in theft / crime. • An increase in informal settlements. • Potential spread of HIV / AIDS. <p><u>Extent of impact:</u> The impact will be local to regional in extent.</p> <p><u>Duration of impact:</u> The duration of the impact will be for the long-term to permanent.</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> High degree of irreplaceable loss</p>				To mitigate the effects of the influx of job seekers to the area.	<p><u>Degree to which impact can be reversed:</u> low degree of reversibility.</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> • As stipulated in the SLP, CAPM will supply basic core skills training to its employees and have set aside an approximate amount of R220 000 for training in HIV / AIDS. • Unreasonable expectations with regards to employment opportunities should not be created. • Stakeholders and affected parties should be kept informed of any developments during all of the project phases. • The applicant should be accessible to the public when concerns, complaints or questions arise. • Proactive engagement with local authorities to ensure that job seekers do not settle in the vicinity of the project area. 	<p>Commissioning / Operational Phase</p> <p>Commissioning / Operational Phase</p> <p>Commissioning / Operational / Closure Phase</p> <p>Planning / Commissioning / Operational / Closure / Post-closure Phase</p> <p>Commissioning / Operational / Closure Phase</p>	Environmental Manager and HR Department			
<u>Proposed activity</u>	3	4	H					3	3	M

5.13.3 Hazards to the community

Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
ENVIRONMENTAL COMPONENT: Socio-economic										



Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
ACTIVITY: The commencement of operations at the No.6 and the No.7 Shafts and eventually the No.4 Shaft and No.1 Shaft.										
PROJECT PHASE APPLICABILITY	Planning and Design									
	Construction									
	Operation	X								
	Decommissioning and Closure	X								
	Post Closure									
The mining operations and related activities may result in several hazards to community. Hazards and annoyances to the local community, other than those described below, have been identified and discussed in Parts 4.9, 4.10, 4.11 and 4.13 above.										
<p><u>Impact description:</u> Due to the close proximity of the shaft areas to residential areas (Orkney, Kanana, Stilfontein, Vaal Reefs), the storage of hazardous materials and chemicals, gas cylinders and welding and cutting equipment poses a hazard to the safety of the community.</p> <p><u>Extent of impact:</u> The impact will be local in extent.</p> <p><u>Duration of impact:</u> The duration of the impact will be for the long-term for the Life of Mine.</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> High degree of irreplaceable loss</p>	To prevent and / or limit public exposure to unacceptable health risks.	<p><u>Degree to which impact can be reversed:</u> low to medium degree of reversibility.</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> Only trained employees will operate machinery and equipment. The Emergency Preparedness and Response Procedure, as well as all other related procedures will be in place prior to the commencement of any activities. All employees will be trained on the possible hazards of the tasks to undertaken, be aware of the contents of all related Standard Operating Procedures and be trained on the appropriate action to be conducted in the event of an emergency. Firefighting equipment will be readily available on all sites. All hazardous substances, chemicals and hydrocarbon material shall be stored in designated facilities and access controlled in order to prevent unauthorized access. All areas in which hazardous substances, chemical and hydrocarbon materials are stored will be inspected on regular basis. All explosives (to be stored underground) shall be stored in designated facilities with strict access control. 	<p>Commissioning / Operational / Closure Phase</p> <p>Commissioning Phase</p> <p>Commissioning / Operational / Closure Phase</p> <p>Planning / Commissioning / Operational / Closure Phase</p> <p>Commissioning / Operational / Closure Phase</p> <p>Commissioning / Operational / Closure Phase</p> <p>Commissioning / Operational / Closure Phase</p>	Environmental Manager						



Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
					<ul style="list-style-type: none"> The applicant should be accessible to the public when concerns, complaints or questions arise. A complaints register will be made available at the mine security offices for I&APs and stakeholders to voice their concerns and raise any complaints. All complaints received will be recorded and kept record along with: <ul style="list-style-type: none"> The manner in which they were received. Time and date. The I&APs details. All correspondence with the complainant. The manner in which the complaint was dealt with. 	Planning / Commissioning / Operational / Closure / Post-closure Phase Planning / Commissioning / Operational / Closure / Post-closure Phase Planning / Commissioning / Operational / Closure / Post-closure Phase				
<u>Proposed activity</u>	3	2	M					2	2	L
<p><u>Impact description:</u> The shaft areas pose a hazard to the community and fauna in the area as all operational shafts will be open until such a time that decommissioning commences and the shafts are sealed.</p> <p><u>Extent of impact:</u> The impact will be limited to site.</p> <p><u>Duration of impact:</u> The duration of the impact will be for the long-term for the Life of Mine.</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> High degree of irreplaceable loss</p>				To prevent and / or limit public exposure to unacceptable health risks.	<p><u>Degree to which impact can be reversed:</u> low degree of reversibility.</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> All shaft surface areas will have strict access control in the form of fences, gates and security and warning signs indicating the hazard of entering the site will be placed at all shafts. During the Closure Phase, the shafts will be appropriately plugged and sealed off. 	Operational and Closure Phase Closure Phase	Environmental Manager			
<u>Proposed activity</u>	3	4	H					2	3	M
<p><u>Impact description:</u> All ore mined at the CAPM Orkney Gold, as described above, will be transported approximately 18 km to the Nicolor South Plant for processing and treatment. Therefore CAPM Orkney Gold Mine proposes to utilise haulage trucks for transportation purposes. This poses a hazard to the community and local residents as the number of mine vehicles will increase on the roads which are used by the local community and residents.</p> <p><u>Extent of impact:</u> The impact local in extent.</p> <p><u>Duration of impact:</u> The duration of the impact will be for the long-term for the Life of Mine.</p>				To prevent and / or limit public exposure to unacceptable health risks.	<p><u>Degree to which impact can be reversed:</u> low degree of reversibility.</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> All mine vehicles, including the haulage trucks, will be inspected and service on a regular basis to ensure roadworthiness. 	Commissioning / Operational and Closure Phase	Environmental Manager, HR Manager, Health and Safety Officer			



Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
<p><u>Degree to which impact will cause irreplaceable loss:</u> High degree of irreplaceable loss</p>					<ul style="list-style-type: none"> All drivers of the vehicles shall be possession of a valid driver's licence, specifically for the class of vehicle being operated. The general traffic rules and speed limits shall be obeyed when utilising public roads. All traffic rules and speed limits within the shaft areas shall be obeyed. Transportation via haul trucks will only take place on roads as designated by the mine. 	<p>Commissioning / Operational / Closure Phase</p> <p>Commissioning / Operational / Closure Phase</p> <p>Commissioning / Operational / Closure Phase</p> <p>Commissioning / Operational / Closure Phase</p>				
<p><u>Proposed activity</u></p>	3	3	M					1	2	L
<p><u>Impact description:</u> The generation of waste on the mine, including asbestos and potential radiation contaminated equipment may result in health hazards to the local community.</p> <p><u>Extent of impact:</u> The impact local in extent.</p> <p><u>Duration of impact:</u> The duration of the impact will be for the long-term to permanent.</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> High degree of irreplaceable loss</p>				<p>To prevent and / or limit public exposure to unacceptable health risks.</p>	<p><u>Degree to which impact can be reversed:</u> low degree of reversibility.</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> A detailed asbestos survey shall be kept at all times. A detailed asbestos handling, storage and disposal procedure shall be compiled an implemented. An appropriate monitoring programme shall be developed and implemented to ensure that the handling, storage and disposal of radio-active contaminated materials and equipment complies with the conditions of the Nuclear Licence. All information shall be reflected within the quarterly NNR Report. All hazardous waste will be removed to a licenced hazardous waste disposal facility and the appropriate safe disposal certificates obtained and kept on record. 	<p>Commissioning / Operational / Closure Phase</p> <p>Commissioning Phase</p> <p>Commissioning Phase</p> <p>Commissioning / Operational / Closure Phase</p> <p>Commissioning / Operational / Closure Phase</p>	<p>Environmental Manager, Health and Safety Officer</p>			



Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
Proposed activity	2	3	M					1	3	L

5.13.4 Rehabilitation and closure

Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)													
	Probability	Magnitude	Severity					Probability	Magnitude	Severity											
ENVIRONMENTAL COMPONENT: Socio-economic																					
ACTIVITY: Decommissioning and closure of the various shaft areas.																					
<table border="1"> <tr> <td rowspan="5">PROJECT PHASE APPLICABILITY</td> <td>Planning and Design</td> <td></td> </tr> <tr> <td>Construction</td> <td></td> </tr> <tr> <td>Operation</td> <td></td> </tr> <tr> <td>Decommissioning and Closure</td> <td>X</td> </tr> <tr> <td>Post Closure</td> <td></td> </tr> </table>											PROJECT PHASE APPLICABILITY	Planning and Design		Construction		Operation		Decommissioning and Closure	X	Post Closure	
PROJECT PHASE APPLICABILITY	Planning and Design																				
	Construction																				
	Operation																				
	Decommissioning and Closure	X																			
	Post Closure																				
<p><u>Impact description:</u> During the decommissioning and closure phase of the various shaft areas, all redundant infrastructure will be removed, the shafts plugged and the surface area rehabilitated. Although to a lesser degree, I&APs may still be negatively impacted upon through the following aspects:</p> <ul style="list-style-type: none"> • Surface water. • Groundwater. • Air quality. • Socio-economic conditions. • Land use and land capability. <p>It is however important to note that as rehabilitation activities continue, it is likely that the nature, probability, magnitude and therefore severity of the negative impacts will dissipate until such a point where rehabilitation is completed, after which some of the negative impacts are likely to be eliminated.</p> <p><u>Extent of impact:</u> The impact will be local in extent.</p> <p><u>Duration of impact:</u> The majority of the impacts which may affected I&APs, will be short term and is dependent on the completion of the rehabilitation activities and the mine obtaining closure.</p> <p><u>Degree to which impact will cause irreplaceable loss:</u> None.</p>	To prevent the increase of negative impacts on I&APs and promote all positive impacts.	<p><u>Degree to which impact can be reversed:</u> The impacts are easily to moderately reversible.</p> <p><u>Proposed mitigation:</u></p> <ul style="list-style-type: none"> • All mitigation measure applied and as described above in Part 5.1 to Part 5.13, will aid in decreasing and minimising the negative impact on the I&APs. • A detailed plan with regards to rehabilitation of the mine must be developed by a rehabilitation specialist registered at the South African Council for Natural Scientific Professions. The rehabilitation plan shall include the following as a minimum: <ul style="list-style-type: none"> ○ Soil sourcing and usage. ○ Vegetation establishment. ○ Most suitable plant and seed mixtures to be utilised. ○ Protected species rescue programme. ○ Monitoring of survival rate of protected species (ex situ). ○ End land use requirements. ○ Long-term erosion prevention. 	Commissioning / Operational / Closure / Post-closure Phase Operational Phase	Environmental Manager and CAPM Gold Management																	



Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
					<ul style="list-style-type: none"> ○ Confirmatory monitoring. ○ Security measures. • Soil <ul style="list-style-type: none"> ○ In development of the rehabilitation plan, consideration towards topsoil availability will be considered, and alternative topsoil sourcing or alternatives to topsoil, if required, to be identified. ○ The soil fertility status should be determined by soil chemical analysis after levelling (before seeding / revegetation) and soil enrichment should be done advised by a soil specialist in order to correct the pH. ○ Rehabilitation and potential erosion problems should be monitored for at least 5 years after closure. ○ Topsoil should not be compacted during the rehabilitation process. ○ Monitoring should result in corrective action taken immediately to remediate erosion or failed rehabilitation. • Topography <ul style="list-style-type: none"> ○ It is recommended that Landscape Functional Analysis (LFA) forms part of the rehabilitation and monitoring process. • Vegetation <ul style="list-style-type: none"> ○ During rehabilitation, colonisation of the disturbed areas by plants species from the surrounding natural vegetation must be monitored to ensure that vegetation cover is sufficient within one growing season. If not, then the areas need to be rehabilitated with a grass seed mix containing species that naturally occur within the study area. ○ Prevent grazing from livestock within the first 2 to 3 years after rehabilitation and prevent access to rehabilitated areas until such time that rehabilitation was successful. ○ If the plants were replanted as part of rehabilitation, the survival of the population of the 'Declining' <i>Boophone disticha</i>, identified adjacent to the No7 Shaft, must be monitored and if 	Operational Phase Closure Phase Closure / Post-closure Closure Phase Operational Phase. Closure Phase Closure / Post-closure Phase Closure / Post-closure Phase				



Environmental impact, extent, duration, significance and degree to which impact will cause irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
					<p>the plants are under threat, they should be removed with the permission of the approving authority and transplanted to suitable habitat.</p> <ul style="list-style-type: none"> ○ The mining area should be rehabilitated and re-vegetated as soon as possible using an appropriate rehabilitation plan which incorporates indigenous plant species. <ul style="list-style-type: none"> • Surface and groundwater <ul style="list-style-type: none"> ○ Rehabilitation should follow the <i>in-situ</i> profile and should be reshaped to be free draining to prevent the ponding and ingress of surface water runoff. • General <ul style="list-style-type: none"> ○ Vehicle access onto the rehabilitated area will be limited in order to avoid compaction. Rehabilitated areas shall be disturbed as little as possible, primarily by rehabilitation and maintenance equipment only. Vehicle speeds should be maintained to reduce the duration of applied pressure. ○ Post rehabilitation monitoring will be implemented, to assess the effectiveness of rehabilitation measures, and the need for further intervention. <ul style="list-style-type: none"> ➢ During and after rehabilitation, colonisation of the disturbed areas by plants species from the surrounding natural vegetation should be monitored. ➢ Monitoring of the rehabilitation success will take place for at least 3 years and will include corrective follow-up action. Access to rehabilitated areas will be prevented until such time that rehabilitation is successful. ○ A closure plan will be developed allowing for annual refining of objectives and commitments based on progress made with rehabilitation and mining activities. • Financial provision will be calculated annually to determine the premature closure cost required to fund the closure of the mining operation at any stage of the mining operation. 	<p>Closure Phase</p> <p>Closure Phase</p> <p>Closure / Post-closure Phase</p> <p>Post-closure Phase</p> <p>Operational Phase</p> <p>Commissioning / Operational / Closure Phase</p>				
<u>Proposed activity</u>			Positive							Positive



6. Impacts and Risk Identified

Environmental component	Activity	Impact description	Duration	Pre-mitigation			Reversible (Yes/No)	Irreplaceable loss (Yes/No)	Avoided/Managed/Mitigated
				Probability	Magnitude	Significance			
Geology	The underground deep level mining of gold bearing ore.	The underground deep level mining requires the blasting and removal of rock in the further sinking of the shafts as well as for the extraction of narrow generally flat dipping gold reefs. This, including the removal of the ore to the surface for processing at the Nicolor South Plant will lead to the permanent destruction of the localised geological strata.	Permanent	5	3	H	No	Yes	Managed
Soil	Commencement mining activities at within the various shaft areas.	Although the majority of the shaft areas are lined with cement, however there are areas within and adjacent to the shaft boundary which comprise of natural vegetation and secondary grasslands. The soil within these areas may therefore be negatively impacted upon should any mining related activities be conducted on these areas.	The duration will be long term for the Life of Mine	3	2	M	Yes	No	Avoided
	Hydrocarbon, chemical and waste materials spillages	Hydrocarbon and chemical spills may pollute soils within the area either through direct contact or indirectly through the contamination of surface water runoff. Similarly unsorted and improper storage of general waste, building rubble or equipment contaminated with radioactive material may contaminated soil either through direct contact or indirectly through the contamination of surface water runoff.	Long term.	3	3	M	Yes	No	Managed
	Decommissioning of the shafts and related infrastructure and rehabilitation of the disturbed footprint areas.	The decommissioning of the shafts and removal of infrastructure will result in the exposure of soil to the elements, resulting in erosion of the soil. This will not only impact on the fertility of the soil but may have an impact on the surface water quality, fauna and flora and sensitive landscapes.	Long term.	3	3	M	Yes	Yes	Mitigated
Land use and land capability	Decommissioning and rehabilitation of all shaft areas and closure of the mine.	It is important to note that the CAPM Orkney Gold Mine is an existing gold mine and has previously been operational. Therefore it is not anticipated that the re-commencement of the mining activities will have a further impact on the land use and land capability. However, during decommissioning and closure, all unnecessary infrastructure will be demolished and the surface area rehabilitated to the agreed upon end land use. Therefore a positive impact may be experienced as the land use may change from mining to agriculture or wilderness.	The positive impact will be long-term to permanent.	Positive			Yes	No	Enhanced
	Operational activities and care and maintenance activities to be conducted at the No.6 and No.7 Shafts and the No.1 to No.5 Shafts, respectively.	<i>Boophone disticha</i> is a plant species with a conservation status of "Declining". The habitat of this plant species is dry grasslands and rocky areas and is widespread in South Africa and extends up the eastern half of southern Africa to Uganda. This plant species was identified within the untransformed grassland areas adjacent to	Long term for the Life of Mine	2	2	L	Yes	Yes	Avoided



Environmental component	Activity	Impact description	Duration	Pre-mitigation			Reversible (Yes/No)	Irreplaceable loss (Yes/No)	Avoided/Managed/Mitigated
				Probability	Magnitude	Significance			
Flora ⁸		<p>the No.7 Shaft. It was also identified that <i>Pearsonia bracteata</i> and <i>Drimia sanguinea</i> could also occur in this area owing to the presence of the suitable habitat. No mining activities will be conducted outside of the underground Mining Right area or the Surface Rights area of the shaft, therefore it is not anticipated that the proposed mining activity at the No.7 Shaft will impact on these species. However in the even that any activities are conducted outside of the shaft boundary area, these species may be impacted upon. Dust, generated from the loading and hauling of the ore, may also settle on the vegetation in this area and may impact on the growth and photosynthesis and transpiration processes of the vegetation.</p> <p>Only three species protected under Schedule 11 of the Transvaal Nature Conservation Act (No.12 of 1983), namely <i>Babiana hypogea</i>, <i>Gladiolus permeabilis</i> and <i>Crinum graminicola</i> were recorded from untransformed grassland (corresponding to shaft footprints #4 and #5) on the study area.</p>							
		<p>The decommissioning of the shafts and removal of infrastructure will result in the exposure of soil to the elements, resulting in erosion of the soil. This will not only impact on the fertility of the soil but may have an impact on the surface water quality, fauna and flora and sensitive landscapes.</p>	Long-term for the Life of Mine.	2	4	M	Yes	Yes	Mitigated
		<p>A number of weeds and invader plant species were identified within the study area. These weeds and invader plant species established on disturbed areas have a tendency to dominate or replace the canopy herbaceous layer of natural ecosystems, thereby transforming the structure, composition and function of natural ecosystems.</p>	Long-term for the Life of Mine.	3	3	M	Yes	Yes	Mitigated
Fauna ⁹	Operational activities and care and maintenance activities to be conducted at the No.6 and No.7 Shafts and the No.1 to No.5 Shafts, respectively.	<p>The study area provides potential habitat for 10 mammal taxa of conservation concern, of which, the following species may occur:</p> <ul style="list-style-type: none"> • Brown Hyaena. • Honey Badger. • South African Hedgehog. • Shrews. • Black-footed cat. 	Long term for the Life of Mine.	3	2	M	No	Yes	Avoided

8 Note: The impacts, significance and respective mitigation measure were obtained from the baseline botanical and faunal biodiversity survey. Refer also to Annexure C3 of the EIA / EMP document.

9 Note: The impacts, significance and respective mitigation measure were obtained from the baseline botanical and faunal biodiversity survey. Refer also to Annexure C3 of the EIA / EMP document.



Environmental component	Activity	Impact description	Duration	Pre-mitigation			Reversible (Yes/No)	Irreplaceable loss (Yes/No)	Avoided/Managed/Mitigated
				Probability	Magnitude	Significance			
		<p>Due to the increased human presence in the area and observation within the study area, both the Brown Hyaena and the Black-footed Cat are said to be irregular in occurrence within the study area. The Honey badger as well as the south African hedgehog are however expected to occur within the study area due to their tolerance to modified habitat types.</p> <p>The bird species of conservation concern are likely to occur within the study area and include:</p> <ul style="list-style-type: none"> • The Melardious Lark (<i>Mirafra cheniana</i>). • The near threatened Abdim's stork (<i>Ciconia abdimii</i>). • The vulnerable Lanner Falcon (<i>Falco biarmicus</i>). <p>The Abdims Stork and the Lanner Falcon were not recorded during the site survey but are classified as likely to occur within the study area. The Melardious Lark was however recorded within the study area during the site survey. 23 other species are sympatric to the study area however they are either irregular visitors to the area or unlikely to be present due to the absence of suitable habitats.</p> <p>Animals within the study area and adjacent to the mine may be hunted and poached, by employees, for food.</p>							
		Animal injury and / or death may result from animal life accessing the mine shaft areas as well as by collisions with vehicles and machinery on and off site.	Long term for the Life of Mine.	2	2	L	No	Yes	Avoided
		Noise generated from mining activities may scare animal life in the vicinity and lead to migration away from the area and possibly even injury and death.	Long term for the Life of Mine.	2	2	L	No	Yes	Avoided
Surface water ¹⁰	No.1 Shaft	<p>The winder cooling ponds are concrete ponds situated next to one of the winder houses and in close proximity of the clean runoff channels. These ponds contain process water used for cooling purposes.</p> <p>Surface water quality: Overflow of winder cooling ponds may lead to affected water discharge into the clean surface runoff channels situated next to the cooling ponds and may result in deterioration in quality of surface water runoff from the Shaft #1 area.</p>	Operational phase	4	1	L	Yes	No	Avoided

10 Note: The impacts, significance and respective mitigation measure were obtained from the conceptual Storm Water Management Plan Specialist Report. Refer also to Annexure C2 of the EIA / EMPr document



Environmental component	Activity	Impact description	Duration	Pre-mitigation			Reversible (Yes/No)	Irreplaceable loss (Yes/No)	Avoided/Managed/Mitigated	
				Probability	Magnitude	Significance				
	Storage and handling of hydrocarbon containers.	Surface water contamination may take place as a result of leaking hydrocarbon containers stored outside of designated areas.	Operational phase	2	2	L	Yes	No	Avoided	
	Containment of affected water.	Overflow from the containment sump underneath the conveyor system may lead to deterioration of clean surface water quality in the immediate vicinity of the Shaft #1 area.	Operational phase	2	2	L	Yes	No	Avoided	
	No.2 Shaft	Uncontrolled surface water runoff.	There are no current diversion measures to prevent surface runoff from flowing into Shaft #2. Runoff retention also takes place inside previously constructed containment facilities.	During care and maintenance/decommissioning.	4	2	M	Yes	No	Avoided
	No.3 Shaft	Rehabilitation of the No.3 Shaft area.	Closure phase: Incorrect rehabilitation techniques may result in exposed areas and areas that will prevent drainage of storm water runoff towards the downstream environment.	During care and maintenance/decommissioning.	2	1	L	Yes	No	Avoided
	No.4 Shaft	Uncontrolled surface water runoff	There are no current diversion measures to prevent surface runoff from flowing into Shaft #4. Runoff retention also takes place inside previously constructed containment facilities within the shaft operations area.	During care and maintenance/operational phase.	4	2	M	Yes	No	Avoided
	No.5 Shaft	Sewage management	A sewage sump is located next to a clean storm water diversion channel downstream of the Shaft #5 hostel area. Mine personnel has indicated that there were previous incidents in which the sump's capacity was reached and sewage entered the clean storm water conveyance channel.	Operational phase of sewage system.	4	3	H	No	Yes	Avoided
	No.6 Shaft	Uncontrolled storm water runoff	There are no current diversion measures to prevent surface runoff from flowing into Shaft #6.	During care and maintenance / operational phase	4	2	M	No	Yes	Avoided
		Wash bay operation	The wash bay will be used as a designated area to clean equipment and currently not fitted with an oil separator. This facility is not connected to a dirty water system and therefore wash water is pumped out and discharged into the adjacent veldt during operations. Surface water quality: Should any wash water be discharged from the wash bay in its current status, discharge of hydrocarbon contaminated water will take place in the surrounding clean water environment.	During operational phase.	3	3	M	No	Yes	Avoided
	No.7 Shaft	Chemical and hydrocarbon management	The main storm water channel is located next to a hydrocarbon and chemical storage area. Any chemical and hydrocarbon containers as well as equipment (operated using grease) stored outside of a designated area creates a risk of surface water pollution. Contaminated runoff as a result of poor housekeeping practises will enter the clean storm water diversion trench towards the adjacent veldt area. Surface water quality:	During operational phase.	3	2	M	No	No	Avoided



Environmental component	Activity	Impact description	Duration	Pre-mitigation			Reversible (Yes/No)	Irreplaceable loss (Yes/No)	Avoided/Managed/Mitigated
				Probability	Magnitude	Significance			
		The quality of surface runoff generated within the Shaft #7 area may be deteriorated as a result of contact with hydrocarbons such as oil and grease.							
	Wash bay operation	<p>The wash bay will be used as a designated area to clean radio-active contaminated equipment. This facility is connected to a dirty water system and wash water is pumped to the adjacent plant and used as part of the process water system. Should an incident occur, radio-active wash water may be discharged towards the clean storm water channel.</p> <p>Surface water quality: Discharge of contaminated water from the wash bay at Shaft #7 may lead to a significant deterioration of surface water quality towards the downstream clean water environment.</p>	During operational phase.	3	3	M	No	No	Avoided
	Sump operation underneath conveyor	<p>A sump has been constructed underneath the conveyor system next to Shaft #7. The purpose of this sump is to contain any seepage from the damp ore material hoisted from underground. This sump is fitted with pumping infrastructure towards the adjacent plant as part of the process water system. There is a risk that overflow into the main storm water channel might occur as a result of pump failure.</p> <p>Surface water quality: Discharge of contaminated water from the sump may result in deterioration of clean surface water runoff towards the adjacent clean water environment.</p>	During operational phase.	3	2	M	No	No	Avoided
Groundwater	Dewatering of the shafts for the safe continuation of mining.	During the operational phase groundwater will be dewatered to the bottom of the Vaal Contact Reef which will result in dewatering of the surrounding aquifer. However, the transient modelling exercise showed that the cone of depression is limited in extent with no boreholes included within its influence zone.	Lasting 1 – 5 years.	3	2	M	Yes	Yes	Managed
	The underground deep level mining of gold bearing ore, including the associated activities conducted on the surface.	The impacts on groundwater quality are primarily related to the management of materials, wastes and spills from drilling operations and unauthorised disposal of contaminated substances. Contamination of groundwater may also arise due to incorrect handling and disposal of waste materials, the physical drilling process (sludge contains oils and greases) and oil leaks from drill rigs. This risk is considered low. Groundwater quality impacts may also arise from seepage from the recycle dam underground, although this is considered a low impact since the	Lasting 1 – 5 years.	3	2	M	Yes	Yes	Mitigated



Environmental component	Activity	Impact description	Duration	Pre-mitigation			Reversible (Yes/No)	Irreplaceable loss (Yes/No)	Avoided/Managed/Mitigated
				Probability	Magnitude	Significance			
		dam will be lined. The general risk towards groundwater quality deterioration is considered low.							
	Decommissioning and closure of the underground workings, shafts and associated infrastructure and well as the shaft surface area.	During the closure phases when all pumping within the region has ceased, the water in the shaft/s may rise towards the Environmentally Critical Level (ECL) where, if contaminated and affected by AMD reactions, may pollute aquifers or surface drainages. The rate at which, and up to which point the water will rise is highly complex and unknown given the multitude of parameters and dewatering schemes within the KOSH area. However previous studies in the KOSH area indicate a likely probability of decant and rise to pre-mining conditions and the ECL. However, at the CAPM 7 Shaft the groundwater table is not expected to return to pre - mining conditions. The reason being that decant will occur at 40 Level, creating a permanent dewatering cone towards 4 Shaft. The quality of the decant water is expected to be contaminated but will improve over time as existing areas of exposed sulphide mineralisation are flooded or oxidised.	Beyond life of Organization / Permanent impacts.	3	5	H	Yes	Yes	Mitigated
Sensitive landscapes	Mining and mining related activities conducted within the shaft areas.	An assessment was conducted against the NFEPA classified wetlands and the proximity of these wetlands to the CAPM Orkney Gold Mine shaft areas. As described in Chapter H of Part 7.4.1 (Part A – Environmental Impact Assessment) of the EIA and EMP, three (3) NFEPA classified wetland areas have been identified to be in close proximity to the No.2 Shaft (unchannelled valley bottom wetland), the No.3 Shaft (channelled Valley Bottom Wetland) and the No.4 Shaft (flat wetland area). The operational activities to be conducted within the vicinity of shaft areas may impact on these wetland areas in terms of surface water quality, fauna, flora and soil aspects (refer also to Part 4.2, Part 4.5, Part 4.6 and Part 4.7). It is however important to note that these shafts are not currently operational as the No.7 and No.6 Shaft will be the first shafts to commence with operations and operations at the No.3 Shaft will not commence as the No.3 Shaft area is in the process of being rehabilitated.	Long-term for the Life of Mine.	2	3	M	Yes	Yes	Avoided
Air quality	The operation and utilization of the fans to remove stale air from the underground working.	The operation and utilisation of the Kanana Vent Duct, No 6 Shaft Veld Fan and the No 7 Shaft Main Fan may result in the release of potentially harmful pollutants and emissions into the air, from the underground workings. This may potentially affect the health of the residents in the area.	Long-term for the Life of Mine.	3	4	H	No	Yes	Avoided
	Hauling of mined ore to the Nicolor South Plant.	As described above, the ore mined at the CAPM Orkney Gold Mine will be transported, via haulage trucks, to the Nicolor South	Long-term for the Life of Mine.	3	2	M	No	No	Mitigated



Environmental component	Activity	Impact description	Duration	Pre-mitigation			Reversible (Yes/No)	Irreplaceable loss (Yes/No)	Avoided/Managed/Mitigated
				Probability	Magnitude	Significance			
		Plant for processing utilising the formal road network. The transportation of the ore may therefore result in the generation dust that may have an impact on the local air quality.							
		As described above, the ore mined at the CAPM Orkney Gold Mine will be transported, via haulage trucks, to the Nicolor South Plant for processing utilising the formal road network. Emissions from the haulage trucks may have a minor impact on the localised air quality.	Long-term for the Life of Mine.	2	2	L	No	No	Mitigated
Noise ¹¹	The reinstatement of operations at the CAPM Orkney Gold Mine No.7 Shaft and No.6.	Currently the shafts are not producing and the noise levels are from normal background noise and activities originating from human interaction and vehicle. In the not too distant future these shafts will be re-opened and the prepared for production. This will include activities such as pumping of water and replacing structures that are worn and damaged. Through this process there will be a great deal of workshop and Commissioning activities and vehicle movement while the shafts and underground workings are prepared. Once operational again the main noise sources will be from the main surface fans and the normal shaft noises.	Long-term.	3	2	M	Yes	No	Managed
	The care and maintenance of the No.1 to No.5 shafts until such a time that they are prepared from operations or decommissioned and rehabilitated.	These shaft will not be re-opened again for production. Normal care and maintenance will be carried on these shafts. Should there be any additional activities carried out, such as the breaking down of shaft structures and buildings, the noise levels should be monitored and the necessary control measures be introduced to minimise the impact on the community. Should operations commence at these shafts, the impacts as described above will apply.	Long-term.	1	1	L	Yes	No	Managed
Visual aspects	The reinstatement of operations at the CAPM Orkney Gold Mine Shaft areas.	Although the CAPM Orkney Gold Mine is an existing mine and the community and regular visitors of the area are likely to be desensitised to the mining related infrastructure, the mine has been under care and maintenance since the year 2010. Therefore, once operations at the shafts commence, the increased traffic and presence of employees as well as the increased generation of dust and emissions clouds from the machinery and vehicles may cause a visual disturbance. There are several sensitive receptors in both the foreground and middle ground that include residential areas and the town of Orkney.	Long-term for the Life of Mine.	3	2	M	Yes	No	Managed

11 Note: The impacts, significance and respective mitigation measure were obtained from the environmental noise impact assessment report. Refer also to Annexure C5 of the EIA / EMPr document.

Environmental component	Activity		Impact description	Duration	Pre-mitigation			Reversible (Yes/No)	Irreplaceable loss (Yes/No)	Avoided/Managed/Mitigated
					Probability	Magnitude	Significance			
Site of archaeological and cultural importance ¹²	No.3 Shaft	The decommissioning and removal of infrastructure and the rehabilitation of the surface area of the No.3 Shaft.	This site with traditional riveted steel headgear is dated to the end of the 1930's. CAPM Orkney Gold Mine removed all infrastructure (including the headgear) at the No.3 Shaft, without being in possession of a demolition permit. This site was demolished between the period of 2011 and 2015. The site is protected by section 34 (1) of Act 25 of 1999, and is rated as "General protection" A (Field Rating IV A) by the SAHRA minimum standards May 2007, therefore cannot be altered or destructed without a demolition permit issued by the relevant heritage authorities.	Permanent	High			No	Yes	mitigated
	No.7 Shaft	The decommissioning and removal of infrastructure workshops at the No.7 Shaft.	This site with traditional riveted steel headgear is dated to the mid 1930's. It is possibly the most representative of the early period of mining in the region. Even so it reflects alterations and updating over time. Most of the site is still intact. The mining objectives of CAPM Gold states that the site will mainly be retained as-is. It will be maintained in its present format allowing for and according to modern mining safety regulations. It is the wish of CAPM Gold to demolish five historic buildings on the eastern perimeter of the site as these are superfluous to the proposed mining perspectives. It includes four steel framed and corrugated iron clad workshops and one brick walled, workshop with wooden trusses and corrugated iron roof. All five buildings are protected by section 34(1) of the National Heritage Act, Act 25 of 1999. These are all rated as "General protection" A (Field Rating IV A) by the SAHRA minimum standards May 2007, therefore cannot be altered or demolished without a demolition permit issued by the relevant heritage authorities.	Permanent	Medium			No	Yes	Mitigated
Socio-economic aspects	The commencement of operations at the No.6 and the No.7 Shafts.		As described in the SLP (attached to the EIA and EMP as Annexure G), upon commencement of operations at the No.7 and the No.6 Shaft the CAPM Orkney Gold Mine will employ 471 individuals (total in fourth year of production) of which a minimum of 95% (with the exception of specialists) will be sourced from the local communities. This is a positive impact in terms of socio-economic aspects as not only will 471 individuals be employed but the community will also benefit indirectly through the increased spending on goods and services, the use of local sub-contractors, as well as leading to a decrease in unemployment of the area.	Positive impact experienced over the long-term for the Life of Mine.	Positive			Yes	No	Enhancement of positive impact

¹² Note: The impacts, significance and respective mitigation measure were obtained from the cultural heritage impact assessment report. Refer also to Annexure C6 of the EIA / EMP document



Environmental component	Activity	Impact description	Duration	Pre-mitigation			Reversible (Yes/No)	Irreplaceable loss (Yes/No)	Avoided/Managed/Mitigated
				Probability	Magnitude	Significance			
	Mine closure.	At the end of the Operational Phase of the Orkney Gold Mine, mining operations will cease and the mine will prepare for decommissioning and closure. Rehabilitation activities will commence, depending on the agreed upon end land, and infrastructure will be removed. During this phase a loss of jobs will occur as the amount of employees required during the Operational Phase will no longer be required.	Permanent	5	4	H	No	Yes	Managed
	The commencement of operations at the No.6 and the No.7 Shafts and eventually the No.4 Shaft and No.1 Shaft.	The commencement of operations at the CAPM Orkney Gold Mine may lead to an influx of job seekers to the area. As stipulated in the SLP of the mine, the mine will employ 471 individuals, of which the majority (a minimum of 95%) will be sourced from the local community. The influx of job seekers to the area may result in several social impacts due to the limited job supply and includes: <ul style="list-style-type: none"> An increase in theft / crime. An increase in informal settlements. Potential spread of HIV / AIDS. 	Long-term to permanent.	3	4	H	No	Yes	Managed
Hazards to community	The commencement of operations at the No.6 and the No.7 Shafts and eventually the No.4 Shaft and No.1 Shaft.	Due to the close proximity of the shaft areas to residential areas (Orkney, Kanana, Stilfontein, Vaal Reefs), the storage of hazardous materials and chemicals, gas cylinders and welding and cutting equipment poses a hazard to the safety of the community.	Long-term for the Life of Mine.	3	2	M	No	Yes	Avoided
		The shaft areas pose a hazard to the community and fauna in the area as all operational shafts will be open until such a time that decommissioning commences and the shafts are sealed.	Long-term for the Life of Mine.	3	4	H	No	Yes	Avoided
		All ore mined at the CAPM Orkney Gold, as described above, will be transported approximately 18 km to the Nicolor South Plant for processing and treatment. There CAPM Orkney Gold Mine proposes to utilise haulage trucks for transportation purposes. This poses a hazard to the community and local residents as the number of mine vehicles will increase on the roads which are used by the local community and residents.	Long-term for the Life of Mine.	3	3	M	No	Yes	Avoided
		The generation of waste on the mine, including asbestos and potential radiation contaminated equipment may result in health hazard to the local community.	Long-term to permanent.	2	3	M	No	Yes	Avoided and Mitigated



7. Assessment of each identified potentially significant impact and risk

Environmental component	Activity	Impact description	Phase (Commissioning/ Commissioning/ Operational/ Decommissioning/ Closure/Post-Closure)	Pre-mitigation Significance	Mitigation type Modify/Remedy/Control/Stop	Post-mitigation Significance
Geology	The underground deep level mining of gold bearing ore.	The underground deep level mining requires the blasting and removal of rock in the further sinking of the shafts as well as for the extraction of narrow generally flat dipping gold reefs. This, including the removal of the ore to the surface for processing at the Nicolor South Plant will lead to the permanent destruction of the localised geological strata.	Operational Phase	High	Control measures will be implemented to prevent the unnecessary destruction of geological strata.	High
Soil	Commencement mining activities at within the various shaft areas.	Although the majority of the shaft areas are lined with cement, there are areas within and adjacent to the shaft boundary which comprise of natural vegetation and secondary grasslands. The soil within these areas may therefore be negatively impacted upon should any mining related activities be conducted on these areas.	Operational and Decommissioning Phase	Medium	Control measures will be implemented to prevent activities from being undertaken within these areas.	Low
	Hydrocarbon, chemical and waste materials spillages	Hydrocarbon and chemical spills may pollute soils within the area either through direct contact or indirectly through the contamination of surface water runoff. Similarly unsorted and improper storage of general waste, building rubble or equipment contaminated with radioactive material may contaminated soil either through direct contact or indirectly through the contamination of surface water runoff.	Operational, Decommissioning and Closure Phase	Medium	Remediation measures will be implemented to contain any spills	Medium
	Decommissioning of the shafts and related infrastructure and rehabilitation of the disturbed footprint areas.	The decommissioning of the shafts and removal of infrastructure will result in the exposure of soil to the elements, resulting in erosion of the soil. This will not only impact on the fertility of the soil but may have an impact on the surface water quality, fauna and flora and sensitive landscapes.	Decommissioning and Closure Phase	Medium	Control measures will be implemented to prevent / stop soil erosion.	Low
Land use and land capability	Decommissioning and rehabilitation of all shaft areas and closure of the mine.	It is important to note that the CAPM Orkney Gold Mine is an existing gold mine and has previously been operational. Therefore it is not anticipated that the re-commencement of the mining activities will have a further impact on the land use and land capability. However, during decommissioning and closure, all unnecessary infrastructure will be demolished and the surface area rehabilitated to the agreed upon end land use. Therefore a positive impact may be experienced as the land use may change from mining to agriculture or wilderness.	Decommissioning and Closure Phase	Positive	Remediation measures will be implemented to return the land to an agreed upon end land use.	Positive
	Operational activities and care and maintenance activities to be conducted at the No.6 and No.7 Shafts and the No.1 to No.5 Shafts, respectively.	<i>Boophone disticha</i> is a plant species with a conservation status of "Declining". The habitat of this plant species is dry grasslands and rocky areas and is widespread in South Africa and extends up the eastern half of southern Africa to Uganda. This plant species was identified within the untransformed grassland areas adjacent to the No.7 Shaft. It was also identified that <i>Pearsonia bracteata</i> and <i>Drimia sanguinea</i> could also occur in this area owing to the presence of the	Operational and Decommissioning Phase	Low	Control measures will be implemented to prevent the disturbance and destruction of the natural vegetation and species of conservation concern.	Low



Environmental component	Activity	Impact description	Phase (Commissioning/ Commissioning/ Operational/ Decommissioning/ Closure/Post- Closure)	Pre- mitigation Significance	Mitigation type Modify/Remedy/Control/Stop	Post- mitigation Significance
Flora ¹³		suitable habitat. No mining activities will be conducted outside of the underground Mining Right area or the Surface Rights area of the shaft, therefore it is not anticipated that the proposed mining activity at the No.7 Shaft will impact on these species. However in the even that any activities are conducted outside of the shaft boundary area, these species may be impacted upon. Dust, generated from the loading and hauling of the ore, may also settle on the vegetation in this area and may impact on the growth and photosynthesis and transpiration processes of the vegetation.				
		Only three species protected under Schedule 11 of the Transvaal Nature Conservation Act (No.12 of 1983), namely <i>Babiana hypogea</i> , <i>Gladiolus permeabilis</i> and <i>Crinum graminicola</i> were recorded from untransformed grassland (corresponding to shaft footprints #4 and #5) on the study area.				
		The decommissioning of the shafts and removal of infrastructure will result in the exposure of soil to the elements, resulting in erosion of the soil. This will not only impact on the fertility of the soil but may have an impact on the surface water quality, fauna and flora and sensitive landscapes.	Decommissioning and Closure Phase	Medium	Control measures will be implemented to prevent / stop soil erosion.	Low
		A number of weeds and invader plant species were identified within the study area. These weeds and invader plant species established on disturbed areas have a tendency to dominate or replace the canopy herbaceous layer of natural ecosystems, thereby transforming the structure, composition and function of natural ecosystems.	Operational, Decommissioning and Closure Phase	Medium	Control measure will be implemented to prevent the establishment and spread of weeds and invader species.	Low
Fauna ¹⁴	Operational activities and care and maintenance activities to be conducted at the No.6 and No.7 Shafts and the No.1 to No.5 Shafts, respectively.	<p>The study area provides potential habitat for 10 mammal taxa of conservation concern, of which, the following species may occur:</p> <ul style="list-style-type: none"> • Brown Hyaena. • Honey Badger. • South African Hedgehog. • Shrews. • Black-footed cat. <p>Due to the increased human presence in the area and observation within the study area, both the Brown Hyaena and the Black-footed Cat are said to be irregular in occurrence within the study area. The Honey badger as well as the</p>	Operation, Decommissioning and Closure Phase	Medium	Control measure will be implemented to prevent the destruction of the natural habitats.	Low

13 Note: The impacts, significance and respective mitigation measure were obtained from the baseline botanical and faunal biodiversity survey. Refer also to Annexure C3 of the EIA / EMP document.

14 Note: The impacts, significance and respective mitigation measure were obtained from the baseline botanical and faunal biodiversity survey. Refer also to Annexure C3 of the EIA / EMP document.



Environmental component	Activity	Impact description	Phase (Commissioning/ Commissioning/ Operational/ Decommissioning/ Closure/Post- Closure)	Pre- mitigation Significance	Mitigation type Modify/Remedy/Control/Stop	Post- mitigation Significance
		<p>south African hedgehog are however expected to occur within the study area due to their tolerance to modified habitat types.</p> <p>The bird species of conservation concern are likely to occur within the study area and include:</p> <ul style="list-style-type: none"> • The Melardious Lark (<i>Mirafra cheniana</i>). • The near threatened Abdim's stork (<i>Ciconia abdimii</i>). • The vulnerable Lanner Falcon (<i>Falco biarmicus</i>). <p>The Abdims Stork and the Lanner Falcon were not recorded during the site survey but are classified as likely to occur within the study area. The Melardious Lark was however recorded within the study area during the site survey. 23 other species are sympatric to the study area however they are either irregular visitors to the area or unlikely to be present due to the absence of suitable habitats.</p> <p>Animals within the study area and adjacent to the mine may be hunted and poached, by employees, for food.</p>				
		Animal injury and / or death may result from animal life accessing the mine shaft areas as well as by collisions with vehicles and machinery on and off site.	Operational and Decommissioning Phase	Low	Control measure will be implemented to prevent unauthorised access to the site and to prevent animals from entering the site.	Low
		Noise generated from mining activities may scare animal life in the vicinity and lead to migration away from the area and possibly even injury and death.	Operational and Decommissioning Phase	Low	Control measure will be implemented to prevent the generation of noise and remediation measure will be implemented in the event that undesired noise is generated.	Low
Surface water ¹⁵	No.1 Shaft	<p>Operation of winder cooling ponds.</p> <p>The winder cooling ponds are concrete ponds situated next to one of the winder houses and in close proximity of the clean runoff channels. These ponds contain process water used for cooling purposes.</p> <p>Surface water quality: Overflow of winder cooling ponds may lead to affected water discharge into the clean surface runoff channels situated next to the cooling ponds and may result in deterioration in quality of surface water runoff from the Shaft #1 area.</p>	Operational Phase	Low	Storm water management measure will be implemented / upgraded to prevent the discharge of contaminated surface water.	Low

15 Note: The impacts, significance and respective mitigation measure were obtained from the conceptual Storm Water Management Plan Specialist Report. Refer also to Annexure C2 of the EIA / EMPr document



Environmental component	Activity	Impact description	Phase (Commissioning/ Commissioning/ Operational/ Decommissioning/ Closure/Post-Closure)	Pre-mitigation Significance	Mitigation type Modify/Remedy/Control/Stop	Post-mitigation Significance	
	Storage and handling of hydrocarbon containers.	Surface water contamination may take place as a result of leaking hydrocarbon containers stored outside of designated areas.	Operational and Decommissioning Phase	Low	Control and remediation measures will be implemented to prevent the contamination of surface water runoff.	Low	
		Containment of affected water.	Overflow from the containment sump underneath the conveyor system may lead to deterioration of clean surface water quality in the immediate vicinity of the Shaft #1 area.	Operational Phase	Low	Storm water management measure will be implemented / upgraded to prevent the discharge of contaminated water.	Low
	No.2 Shaft	Uncontrolled surface water runoff.	There are no current diversion measures to prevent surface runoff from flowing into Shaft #2. Runoff retention also takes place inside previously constructed containment facilities.	Operational and Decommissioning Phase	Medium	Storm water management measure will be implemented.	Low
	No.3 Shaft	Rehabilitation of the No.3 Shaft area.	Closure phase: Incorrect rehabilitation techniques may result in exposed areas and areas that will prevent drainage of storm water runoff towards the downstream environment.	Decommissioning and Closure Phase	Low	Control measures and rehabilitation monitoring programmes will be implemented to ensure that rehabilitation is conducted in the appropriate manner.	Low
	No.4 Shaft	Uncontrolled surface water runoff	There are no current diversion measures to prevent surface runoff from flowing into Shaft #4. Runoff retention also takes place inside previously constructed containment facilities within the shaft operations area.	Operational and Decommissioning Phase	Medium	Storm water management measure will be implemented.	Low
	No.5 Shaft	Sewage management	A sewage sump is located next to a clean storm water diversion channel downstream of the Shaft #5 hostel area. Mine personnel has indicated that there were previous incidents in which the sump's capacity was reached and sewage entered the clean storm water conveyance channel.	Operational and Decommissioning Phase	High	Storm water management measures will be implemented to contain spillages from the sump and divert clean surface water runoff away from the area.	Low
	No.6 Shaft	Uncontrolled storm water runoff	There are no current diversion measures to prevent surface runoff from flowing into Shaft #6.	Operational Phase	Medium	Storm water management measures will be implemented.	Low
		Wash bay operation	The wash bay will be used as a designated area to clean equipment and currently not fitted with an oil separator. This facility is not connected to a dirty water system and therefore wash water is pumped out and discharged into the adjacent veldt during operations. Surface water quality: Should any wash water be discharged from the wash bay in its current status, discharge of hydrocarbon contaminated water will take place in the surrounding clean water environment.	Operational and Decommissioning Phase	Medium	Storm water management measure and control measures will be implemented to prevent the discharge of contaminated surface water runoff.	Low
	No.7 Shaft	Chemical and hydrocarbon management	The main storm water channel is located next to a hydrocarbon and chemical storage area. Any chemical and hydrocarbon containers as well as equipment (operated using grease) stored outside of a designated area creates a risk of surface water pollution. Contaminated runoff as a result of poor housekeeping	Operational and Decommissioning Phase	Medium	Control and storm water management measures will be implemented to prevent the contamination of clean surface water runoff	Low



Environmental component	Activity	Impact description	Phase (Commissioning/ Commissioning/ Operational/ Decommissioning/ Closure/Post- Closure)	Pre- mitigation Significance	Mitigation type Modify/Remedy/Control/Stop	Post- mitigation Significance
		practises will enter the clean storm water diversion trench towards the adjacent veldt area. Surface water quality: The quality of surface runoff generated within the Shaft #7 area may be deteriorated as a result of contact with hydrocarbons such as oil and grease.				
	Wash bay operation	The wash bay will be used as a designated area to clean radio-active contaminated equipment. This facility is connected to a dirty water system and wash water is pumped to the adjacent plant and used as part of the process water system. Should an incident occur, radio-active wash water may be discharged towards the clean storm water channel. Surface water quality: Discharge of contaminated water from the wash bay at Shaft #7 may lead to a significant deterioration of surface water quality towards the downstream clean water environment.	Operational and Decommissioning Phase	Medium	Control and storm water management measures will be implemented	Low
	Sump operation underneath conveyor	A sump has been constructed underneath the conveyor system next to Shaft #7. The purpose of this sump is to contain any seepage from the damp ore material hoisted from underground. This sump is fitted with pumping infrastructure towards the adjacent plant as part of the process water system. There is a risk that overflow into the main storm water channel might occur as a result of pump failure. Surface water quality: Discharge of contaminated water from the sump may result in deterioration of clean surface water runoff towards the adjacent clean water environment.	Operational Phase	Medium	Storm water management measures will be implemented / upgraded to prevent the discharge of contaminated water.	Low
Groundwater	Dewatering of the shafts for the safe continuation of mining.	During the operational phase groundwater will be dewatered to the bottom of the Vaal Contact Reef which will result in dewatering of the surrounding aquifer. However, the transient modelling exercise showed that the cone of depression is limited in extent with no boreholes included within its influence zone.	Operational Phase	Medium	Control measure will be implemented.	Medium
	The underground deep level mining of gold bearing ore, including the associated activities conducted on the surface.	The impacts on groundwater quality are primarily related to the management of materials, wastes and spills from drilling operations and unauthorised disposal of contaminated substances. Contamination of groundwater may also arise due to incorrect handling and disposal of waste materials, the physical drilling process (sludge contains oils and greases) and oil leaks from drill rigs. This risk is considered low. Groundwater quality impacts may also arise from seepage from the recycle dam underground, although this is considered a low impact	Operational and Decommissioning Phase	Medium	Control measures will be implemented to prevent the contamination of groundwater resources.	Medium



Environmental component	Activity	Impact description	Phase (Commissioning/ Commissioning/ Operational/ Decommissioning/ Closure/Post- Closure)	Pre- mitigation Significance	Mitigation type Modify/Remedy/Control/Stop	Post- mitigation Significance
		since the dam will be lined. The general risk towards groundwater quality deterioration is considered low.				
	Decommissioning and closure of the underground workings, shafts and associated infrastructure and well as the shaft surface area.	During the closure phases when all pumping within the region has ceased, the water in the shaft/s may rise towards the Environmentally Critical Level (ECL) where, if contaminated and affected by AMD reactions, may pollute aquifers or surface drainages. The rate at which, and up to which point the water will rise is highly complex and unknown given the multitude of parameters and dewatering schemes within the KOSH area. However previous studies in the KOSH area indicate a likely probability of decant and rise to pre-mining conditions and the ECL. However, at the CAPM 7 Shaft the groundwater table is not expected to return to pre - mining conditions. The reason being that decant will occur at 40 Level, creating a permanent dewatering cone towards 4 Shaft. The quality of the decant water is expected to be contaminated but will improve over time as existing areas of exposed sulphide mineralisation are flooded or oxidised.	Decommissioning and Closure Phase	High	Control measure will be implemented.	Medium
Sensitive landscapes	Mining and mining related activities conducted within the shaft areas.	An assessment was conducted against the NFEPA classified wetlands and the proximity of these wetlands to the CAPM Orkney Gold Mine shaft areas. As described in Chapter H of Part 7.4.1 (Part A – Environmental Impact Assessment) of the EIA and EMP, three (3) NFEPA classified wetland areas have been identified to be in close proximity to the No.2 Shaft (unchannelled valley bottom wetland), the No.3 Shaft (channelled Valley Bottom Wetland) and the No.4 Shaft (flat wetland area). The operational activities to be conducted within the vicinity of shaft areas may impact on these wetland areas in terms of surface water quality, fauna, flora and soil aspects (refer also to Part 4.2, Part 4.5, Part 4.6 and Part 4.7). It is however important to note that these shafts are not currently operational as the No.7 and No.6 Shaft will be the first shafts to commence with operations and operations at the No.3 Shaft will not commence as the No.3 Shaft area is in the process of being rehabilitated.	Operational and Decommissioning Phase	Medium	Control and storm water management measures will be implemented.	Low
Air quality	The operation and utilization of the fans to remove stale air from the underground working.	The operation and utilisation of the Kanana Vent Duct, No 6 Shaft Veld Fan and the No 7 Shaft Main Fan may result in the release of potentially harmful pollutants and emissions into the air, from the underground workings. This may potentially affect the health of the residents in the area.	Operational Phase	High	A monitoring programme will be implemented.	Medium
	Hauling of mined ore to the Nicolor South Plant.	As described above, the ore mined at the CAPM Orkney Gold Mine will be transported, via haulage trucks, to the Nicolor South Plant for processing utilising the formal road network. The transportation of the ore may therefore result in the generation of dust that may have an impact on the local air quality.	Operational Phase	Medium	A monitoring programme and control measures will be implemented.	Low
		As described above, the ore mined at the CAPM Orkney Gold Mine will be transported, via haulage trucks, to the Nicolor South Plant for processing utilising	Operational Phase	Low	Control measure will be implemented.	Low



Environmental component	Activity	Impact description	Phase (Commissioning/ Commissioning/ Operational/ Decommissioning/ Closure/Post- Closure)	Pre- mitigation Significance	Mitigation type Modify/Remedy/Control/Stop	Post- mitigation Significance
		the formal road network. Emissions from the haulage trucks may have a minor impact on the localised air quality.				
Noise ¹⁶	The reinstatement of operations at the CAPM Orkney Gold Mine No.7 Shaft and No.6.	Currently the shafts are not producing and the noise levels are from normal background noise and activities originating from human interaction and vehicle. In the not too distant future these shafts will be re-opened and the prepared for production. This will include activities such as pumping of water and replacing structures that are worn and damaged. Through this process there will be a great deal of workshop and Commissioning activities and vehicle movement while the shafts and underground workings are prepared. Once operational again the main noise sources will be from the main surface fans and the normal shaft noises.	Commissioning and Operational Phase	Medium	Control measure will be implemented.	Low
	The care and maintenance of the No.1 to No.5 shafts until such a time that they are prepared from operations or decommissioned and rehabilitated.	These shaft will not be re-opened again for production. Normal care and maintenance will be carried on these shafts. Should there be any additional activities carried out, such as the breaking down of shaft structures and buildings, the noise levels should be monitored and the necessary control measures be introduced to minimise the impact on the community. Should operations commence at these shafts, the impacts as described above will apply.	Operational and Decommissioning Phase	Low	Control measures will be implemented.	Low
Visual aspects	The reinstatement of operations at the CAPM Orkney Gold Mine Shaft areas.	Although the CAPM Orkney Gold Mine is an existing mine and the community and regular visitors of the area are likely to be desensitised to the mining related infrastructure, the mine has been under care and maintenance since the year 2010. Therefore, once operations at the shafts commence, the increased traffic and presence of employees as well as the increased generation of dust and emissions clouds from the machinery and vehicles may cause a visual disturbance. There are several sensitive receptors in both the foreground and middle ground that include residential areas and the town of Orkney.	Operational and Decommissioning Phase	Medium	Control measures will be implemented.	Low
Site of archaeological and cultural importance ¹⁷	No.3 Shaft The decommissioning and removal of infrastructure and the rehabilitation of the surface area of the No.3 Shaft.	This site with traditional riveted steel headgear is dated to the end of the 1930's. CAPM Orkney Gold Mine removed all infrastructure (including the headgear) at the No.3 Shaft, without being in possession of a demolition permit. This site was demolished between the period of 2011 and 2015. The site is protected by section 34 (1) of Act 25 of 1999, and is rated as "General protection" A (Field Rating IV A) by the SAHRA minimum standards May 2007, therefore cannot be	Operational Phase	High	Mitigation measures will be implemented and the correct procedure will be requested and followed.	Unknown at present

16 Note: The impacts, significance and respective mitigation measure were obtained from the environmental noise impact assessment report. Refer also to Annexure C5 of the EIA / EMPr document.

17 Note: The impacts, significance and respective mitigation measure were obtained from the cultural heritage impact assessment report. Refer also to Annexure C6 of the EIA / EMPr document



Environmental component	Activity	Impact description	Phase (Commissioning/ Commissioning/ Operational/ Decommissioning/ Closure/Post- Closure)	Pre- mitigation Significance	Mitigation type Modify/Remedy/Control/Stop	Post- mitigation Significance
		altered or destroyed without a demolition permit issued by the relevant heritage authorities.				
	No.7 Shaft The decommissioning and removal of infrastructure workshops at the No.7 Shaft.	This site with traditional riveted steel headgear is dated to the mid 1930's. It is possibly the most representative of the early period of mining in the region. Even so it reflects alterations and updating over time. Most of the site is still intact. The mining objectives of CAPM Gold states that the site will mainly be retained as-is. It will be maintained in its present format allowing for and according to modern mining safety regulations. It is the wish of CAPM Gold to demolish five historic buildings on the eastern perimeter of the site as these are superfluous to the proposed mining perspectives. It includes four steel framed and corrugated iron clad workshops and one brick walled, workshop with wooden trusses and corrugated iron roof. All five buildings are protected by section 34(1) of the National Heritage Act, Act 25 of 1999. These are all rated as "General protection" A (Field Rating IV A) by the SAHRA minimum standards May 2007, therefore cannot be altered or demolished without a demolition permit issued by the relevant heritage authorities.	Commissioning and Operational Phase	Medium	Mitigation measures will be implemented by following the correct procedure and obtaining appropriate authorisations.	No Risk if proper procedures are applied and demolition permits are obtained
Socio-economic aspects	The commencement of operations at the No.6 and the No.7 Shafts.	As described in the SLP (attached to the EIA and EMP as Annexure G), upon commencement of operations at the No.7 and the No.6 Shaft the CAPM Orkney Gold Mine will employ 471 individuals (total in fourth year of production) of which a minimum of 95% (with the exception of specialists) will be sourced from the local communities. This is a positive impact in terms of socio-economic aspects as not only will 471 individuals be employed but the community will also benefit indirectly through the increased spending on goods and services, the use of local sub-contractors, as well as leading to a decrease in unemployment of the area.	Operational Phase	Positive	Enhancement measures will be implemented.	Positive
	Mine closure.	At the end of the Operational Phase of the Orkney Gold Mine, mining operations will cease and the mine will prepare for decommissioning and closure. Rehabilitation activities will commence, depending on the agreed upon end land, and infrastructure will be removed. During this phase a loss of jobs will occur as the amount of employees required during the Operational Phase will no longer be required.	Decommissioning and Closure Phase	High	Control measures will be implemented.	High
	The commencement of operations at the No.6 and the No.7 Shafts and eventually the No.4 Shaft and No.1 Shaft.	The commencement of operations at the CAPM Orkney Gold Mine may lead to an influx of job seekers to the area. As stipulated in the SLP of the mine, the mine will employ 471 individuals, of which the majority (a minimum of 95%) will be sourced from the local community. The influx of job seekers to the area may result in several social impacts due to the limited job supply and includes: <ul style="list-style-type: none"> An increase in theft / crime. An increase in informal settlements. 	Commissioning and Operational Phase	High	Control measures will be implemented.	Medium



Environmental component	Activity	Impact description	Phase (Commissioning/ Commissioning/ Operational/ Decommissioning/ Closure/Post- Closure)	Pre- mitigation Significance	Mitigation type Modify/Remedy/Control/Stop	Post- mitigation Significance
		<ul style="list-style-type: none"> Potential spread of HIV / AIDS. 				
Hazards to community	The commencement of operations at the No.6 and the No.7 Shafts and eventually the No.4 Shaft and No.1 Shaft.	Due to the close proximity of the shaft areas to residential areas (Orkney, Kanana, Stilfontein, Vaal Reefs), the storage of hazardous materials and chemicals, gas cylinders and welding and cutting equipment poses a hazard to the safety of the community.	Operational and Decommissioning Phase	Medium	Control measures will be implemented to prevent the exposures of the community to unnecessary hazards.	Low
		The shaft areas pose a hazard to the community and fauna in the area as all operational shafts will be open until such a time that decommissioning commences and the shafts are sealed.	Commissioning, Operational and decommissioning Phase	High	Control measures will be implemented to prevent the exposures of the community to unnecessary hazards.	Medium
		All ore mined at the CAPM Orkney Gold, as described above, will be transported approximately 18 km to the Nicolor South Plant for processing and treatment. There CAPM Orkney Gold Mine proposes to utilise haulage trucks for transportation purposes. This poses a hazard to the community and local residents as the number of mine vehicles will increase on the roads which are used by the local community and residents.	Operational Phase	Medium	Control measures will be implemented to prevent the exposures of the community to unnecessary hazards.	Low
		The generation of waste on the mine, including asbestos and potential radiation contaminated equipment may result in health hazard to the local community.	Commissioning, Operational and Decommissioning Phase	Medium	Control measures will be implemented to prevent the exposures of the community to unnecessary hazards.	Low



8. Impacts to be mitigated in their respective phases

Table 13: Measures to rehabilitate the environment affected by the undertaking of any listed activity

Environmental component	Activity	PHASE Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure.	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m ²)	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
Geology	The underground deep level mining of gold bearing ore.	Operational Phase	Mining Right area = 10 561.7 ha	<ul style="list-style-type: none"> The mining activities will be limited to within the Mining Rights boundary area and only to what is required in the mine plan. The correct stoping width should be maintained. 	In compliance with the Mining Right issued in terms of the MPRDA (2002) and the Environmental management Programme.	Operational Phase
Soil	Commencement mining activities within the various shaft areas.	Operational and Decommissioning Phase	Mining Right area = 10 561.7 ha Shaft 7 = 11.7 ha Shaft 6 = 1.4 ha Shaft 5 = 40.3 ha Shaft 4 = 35.0 ha Shaft 3 = 7.5 ha Shaft 2 = 29.0 ha Shaft 1 = 7.6 ha	<ul style="list-style-type: none"> Prevent the release of contaminated surface water runoff. 	The prevention of the release of contaminated surface water is in line with the objectives of the DWS Best Practices Guideline H2: Pollution Prevention and Minimization of Impacts	Commissioning and Operational Phase
				<ul style="list-style-type: none"> Demarcate all areas, within the shaft surface areas, in which no unauthorised activities should take place. 	The demarcation will allow for these areas to remain undisturbed thereby keeping the dirty water management areas as small as possible. This is in line with the DWS Best Practice Guideline G1: Storm Water Management.	
				<ul style="list-style-type: none"> All spillages should be identified, cleaned and remediated as soon as possible. 	In compliance with the Nation Environmental Management Waste Act, 2008 (Act No. 59 of 2008) and the National Norms and Standards for the	Life of mine



Environmental component	Activity	PHASE Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure.	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m ²)	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
	Hydrocarbon, chemical and waste materials spillages	Operational, Decommissioning and Closure Phase	-	<ul style="list-style-type: none"> Prevent the release of contaminated surface water runoff. 	Remediation of Contaminated Land and Soil Quality (GNR.331 of 2014), thereunder.	
				<ul style="list-style-type: none"> Demarcate all area, within the shaft surface areas, in which no unauthorised activities should take place. 	The prevention of the release of contaminated surface water is in line with the objectives of the DWS Best Practices Guideline H2: Pollution Prevention and Minimization of Impacts	Commissioning and Operational Phase
				<ul style="list-style-type: none"> All spillages should be identified, cleaned and remediated as soon as possible. 	The demarcation will allow for these areas to remain undisturbed thereby keeping the dirty water management areas as small as possible. This is in line with the DWS Best Practice Guideline G1: Storm Water Management.	Life of Mine
				<ul style="list-style-type: none"> The Emergency Prepared Response Procedure as well as other related Standard Operating Procedures (SOPs) will be implemented prior to the commencement of mining and mining related activities. 	In compliance with the Nation Environmental Management Waste Act, 2008 (Act No. 59 of 2008) and the National Norms and Standards for the Remediation of Contaminated Land and Soil Quality (GNR.331 of 2014), thereunder.	In compliance with the Mine Health and Safety



Environmental component	Activity	PHASE Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure.	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m ²)	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
				<ul style="list-style-type: none"> All hydrocarbon and chemical substances should be stored in lined, bunded and demarcated areas. 	Act, 1996 (Act No. 29 of 1996).	Life of Mine, as required
				<ul style="list-style-type: none"> Allow vegetation to re-establish on all rehabilitated areas. 	In line with Regulation 70 of the Mineral and Petroleum Resources Development Regulation, GNR587 (2004).	Rehabilitation Phase, upon cessation of infrastructure removal.
				<ul style="list-style-type: none"> All rehabilitated areas should be monitored on a regular basis to ensure that no erosion is occurring, until such a time that rehabilitation is complete and the agreed upon end land use achieved. 	In line with Regulation 70 of the Mineral and Petroleum Resources Development Regulation, GNR587 (2004).	At the onset of rehabilitation activities.
				<ul style="list-style-type: none"> The weed and declared invader management plan should continue to be implemented during the rehabilitation phase. 	The continued implementation of the declared weed and alien invader management plan is in compliance with the NEM:BA (2004) and the regulations thereunder.	Life of mine and throughout the Rehabilitation Phase
Land use and land capability	Decommissioning and rehabilitation of all shaft areas and closure of the mine.	Decommissioning and Closure Phase	Shaft 7 = 11.7 ha Shaft 6 = 1.4 ha Shaft 5 = 40.3 ha Shaft 4 = 35.0 ha Shaft 3 = 7.5 ha Shaft 2 = 29.0 ha Shaft 1 = 7.6 ha	<ul style="list-style-type: none"> The positive impact should be enhanced by rehabilitating as much of the disturbed surface area as possible, depending on the agreed upon end land use and taking the DMR and the municipalities requirements into account. 	By rehabilitation as much of the disturbed area as possible, the dirty water management area is reduced. This is in line with the DWS Best Practice Guidelines for the isolation of clean and dirty water management	On set of Rehabilitation Phase



Environmental component	Activity	PHASE Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure.	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m ²)	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
					areas, and reducing the size of the dirty water management areas.	
Flora ¹⁸	Operational activities and care and maintenance activities to be conducted at the No.6 and No.7 Shafts and the No.1 to No.5 Shafts, respectively.	Operational, Decommissioning and Closure Phase	Shaft 7 = 11.7 ha Shaft 6 = 1.4 ha Shaft 5 = 40.3 ha Shaft 4 = 35.0 ha Shaft 3 = 7.5 ha Shaft 2 = 29.0 ha Shaft 1 = 7.6 ha	<ul style="list-style-type: none"> The shaft areas will be fenced in to prevent unauthorised access. All areas within which activities can take place should be demarcated. 	This is in compliance with section 5 of the Mine Health and Safety Act (1996).	Commissioning and Operational Phase
				<ul style="list-style-type: none"> Access control, to prevent unauthorised access to the secondary grassland areas, should be implemented. 		Commissioning and Operational Phase for the Life of Mine
				<ul style="list-style-type: none"> An air quality and dust fallout monitoring programme will be implemented 		Air quality and dust fallout monitoring will determine if the minimum thresholds as stipulated in the NEM:AQA (2004) and regulation thereunder are not exceeded. Should they be exceeded the appropriate actions will be undertaken an Atmospheric Emissions Licence will be applied for. This is in compliance with the MPRDA (2002), the NEM:AQA (2004) and the Mine Health and Safety Act (1996).
				<ul style="list-style-type: none"> All loaded haul trucks are to remain covered during the transportation. 	Operational Phase	
				<ul style="list-style-type: none"> All machinery, vehicles and haul trucks should be inspected and serviced on a regular basis. 		Life of Mine commencing from the Commissioning and Operational Phase
				<ul style="list-style-type: none"> Implement good housekeeping practices to limit the generation of dirty areas within the Shaft #7 area. 	Keeping the dirty water management areas as small as possible is in line with the DWS Best Practice Guideline G1: Storm Water Management.	

18 Note: The impacts, significance and respective mitigation measure were obtained from the baseline botanical and faunal biodiversity survey. Refer also to Annexure C3 of the EIA / EMPr document.



Environmental component	Activity	PHASE Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure.	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m ²)	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
				<ul style="list-style-type: none"> It is recommended that protected plants in danger of becoming destroyed during any of the planned activities be removed (rescued) prior to the commencement of Commissioning activities and trans-located to transformed or degraded habitat of potentially suitable habitat within the study area, or used during the rehabilitation phase. A permit would be required to remove or disturb the protected plant species. A weed and declared invader management plan will be implemented to monitor and remove all weeds and declared invaders identified on site. The weed and declared invader management plan should be continued with during the Decommissioning and Closure Phase and all of the rehabilitated areas should continue to be inspected to ensure the removal and management of weeds and declared invader plants. Areas of disturbance will be limited to only what is required within the mine plan and will be limited to the shaft footprint areas. 	<p>The commissioning of these mitigation measures are in compliance with the NEM:BA (2004) and the regulations thereunder.</p> <p>In Compliance with the Mining Right.</p>	<p>Life of Mine through Decommissioning Phase and Rehabilitation Phase</p> <p>Commissioning and Operational Phase for the Life of Mine</p>
Fauna ¹⁹	Operational activities and care and maintenance activities to be conducted at the No.6 and No.7 Shafts and the No.1 to No.5 Shafts, respectively.	Operational and Decommissioning Phase	Shaft 7 = 11.7 ha Shaft 6 = 1.4 ha Shaft 5 = 40.3 ha Shaft 4 = 35.0 ha Shaft 3 = 7.5 ha Shaft 2 = 29.0 ha Shaft 1 = 7.6 ha	<ul style="list-style-type: none"> All employees should be trained on the importance of the all aspects of the environment (including fauna and flora). No employees will be allowed to hunt or poach animals within or around the CAPM Orkney Gold Mine area. 	<p>The development and implementation of an Environmental Awareness Plan and the training of employees regarding the importance of the environment and potential impacts to the environment is in compliance with Regulation 51 of the MPRDA (2002).</p> <p>This is in compliance with the NEM:BA (2004) and</p>	<p>Commissioning and Operational Phase throughout the Life of Mine.</p>

¹⁹ Note: The impacts, significance and respective mitigation measure were obtained from the baseline botanical and faunal biodiversity survey. Refer also to Annexure C3 of the EIA / EMP document.



Environmental component	Activity	PHASE Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure.	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m ²)	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION	
					the regulations thereunder.		
				<ul style="list-style-type: none"> All shaft areas will be fenced to not only prevent unauthorized access but also to prevent animal life from entering the shaft areas. 	This is in compliance with section 5 of the Mine Health and Safety Act (1996).		
				<ul style="list-style-type: none"> Mitigation measure in terms of noise, will be implemented to prevent and minimize the effects of noise on animal life. 	In compliance with the Mine Health and Safety Act, 1996 (Act No. 29 of 1996) and the DMR guidelines for noise control.		
Surface water ²⁰	No.1 Shaft	Operation of winder cooling ponds.	Operational Phase	Shaft 1 = 7.6 ha	<ul style="list-style-type: none"> An operational procedure should be implemented to maintain sufficient free-board and limit process water spillages into the clean water system. 	This is line with the DWS Best Practice Guidelines, to prevent and minimise impacts and to ensure the separation of clean and dirty water management areas.	Commissioning and Operational Phase
		Storage and handling of hydrocarbon containers.	Operational and Decommissioning Phase		<ul style="list-style-type: none"> Implement good house-keeping practises and implement a procedure for the storage and handling of hydrocarbon containers and spillages. 		Commissioning and Operational Phase throughout the Life of Mine.
		Containment of affected water.	Operational Phase		<ul style="list-style-type: none"> Hydrocarbon containers should be stored within designated areas, preferably bunded and roofed. 		Commissioning and Operational Phase
	No.2 Shaft	Uncontrolled surface water runoff.	Operational and Decommissioning Phase	Shaft 2 = 29.0 ha	<ul style="list-style-type: none"> Implement regular inspections and a maintenance schedule to ensure pumping infrastructure is functional at all times to limit possible sump overflow. 		Commissioning and Operational Phase
					<ul style="list-style-type: none"> Implement storm water diversion measures at the shaft area to prevent ingress of surface runoff into the shaft during heavy rainfall events. 		Life of mine
					<ul style="list-style-type: none"> Areas where surface water retention takes place should be minimised to encourage free drainage of surface water towards the downstream environment. 		Commissioning and Operational Phase and maintained throughout the Life of Mine
				<ul style="list-style-type: none"> Obstructions within current storm water trenches should be removed to promote free drainage of the Shaft #2 area. 			

²⁰ Note: The impacts, significance and respective mitigation measure were obtained from the conceptual Storm Water Management Plan Specialist Report. Refer also to Annexure C2 of the EIA / EMPr document



Environmental component	Activity		PHASE	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m ²)	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure.				
	No.3 Shaft	Rehabilitation of the No.3 Shaft area.	Decommissioning and Closure Phase	Shaft 3 = 7.5 ha	<ul style="list-style-type: none"> It is imperative that the Shaft #3 area be rehabilitated to ensure free drainage of surface flow towards the downstream environment. 		Commence from the on-set of the Decommissioning Phase throughout the Rehabilitation Phase
					<ul style="list-style-type: none"> Vegetation growth should be promoted to reduce the possibility of erosion of exposed areas. 		Onset of Rehabilitation Phase
					<ul style="list-style-type: none"> Obstructions within current storm water trenches should be removed to promote free drainage of the Shaft #3 area. 		Commissioning and Operational Phase and maintained throughout the Life of Mine
	No.4 Shaft	Uncontrolled surface water runoff	Operational and Decommissioning Phase	Shaft 4 = 35.0 ha	<ul style="list-style-type: none"> Implement storm water diversion measures at the shaft area to prevent ingress of surface runoff into the shaft during heavy rainfall events. 		Commissioning and Operational Phase
					<ul style="list-style-type: none"> Areas where surface water retention takes place should be minimised to encourage free drainage of surface water towards the downstream environment. 		Commissioning and Operational Phase and maintained throughout the Life of Mine
					<ul style="list-style-type: none"> Obstructions within current storm water trenches should be removed to promote free drainage of the Shaft #4 area. 		
	No.5 Shaft	Sewage management	Operational and Decommissioning Phase	Shaft 5 = 40.3 ha	<ul style="list-style-type: none"> Implement regular inspections and ensure that the sump is serviced on a daily basis. 		Commissioning and Operational Phase
					<ul style="list-style-type: none"> As an additional measure, construct a berm between the sewage sump and the clean storm water channel to prevent sewage from entering the channel during possible overflow. 		
	No.6 Shaft	Uncontrolled storm water runoff	Operational Phase	Shaft 6 = 1.4 ha	<ul style="list-style-type: none"> Implement storm water diversion measures at the shaft area to prevent ingress of surface runoff into the shaft during heavy rainfall events. 		Commissioning and Operational Phase and maintained throughout the Life of Mine
					<ul style="list-style-type: none"> Areas where surface water retention takes place should be minimised to encourage free drainage of surface water towards the downstream environment. 		
					<ul style="list-style-type: none"> Obstructions within current storm water trenches should be removed to promote free drainage of the Shaft #6 area. 		
		Wash bay operation		<ul style="list-style-type: none"> Implement an oil separator system at the wash bay to lower the hydrocarbon content of wash water to be discharged into the clean environment. 	Commissioning and Operational Phase		



Environmental component	Activity		PHASE Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure.	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m ²)	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			Operational and Decommissioning Phase		<ul style="list-style-type: none"> Regular inspections should be conducted to ensure that the oil separator is in working order at all times. Conduct regular monitoring of discharge of wash water to comply with the DWS general limit standards for discharge. Obstructions within current storm water trenches should be removed to promote free drainage of the Shaft #6 area. 		Commissioning and Operational Phase throughout the Life of Mine
		Chemical and hydrocarbon management	Operational and Decommissioning Phase		<ul style="list-style-type: none"> Implement good housekeeping practises to limit the generation of dirty areas with the Shaft #7 area. 		
		Wash bay operation	Operational and Decommissioning Phase		<ul style="list-style-type: none"> Construct containment walls around the wash bay as a measure to contain possible overflow from the sump. Implement regular inspections and a maintenance schedule to ensure that pumping infrastructure is in working order during operations. 		
	Sump operation underneath conveyor	Operational Phase	<ul style="list-style-type: none"> Implement regular inspections and a maintenance schedule to ensure that pumping infrastructure is in working order during operations. 				
Groundwater	Dewatering of the shafts for the safe continuation of mining.		Operational Phase	1Ml per day	<ul style="list-style-type: none"> Intercept drainage around the shaft. The dewatering of the aquifer system cannot be prevented. If the monitoring program indicates that nearby groundwater users are affected by the dewatering, the users need to be compensated for the loss. 	This is in compliance with GN.704 under the NWA (1998) as well as the DWS Best practice Guideline G1: Storm Water Management.	Commissioning and Operational Phase throughout the Life of Mine until such a time that the shaft is sealed.
	The underground deep level mining of gold bearing ore, including the associated activities conducted on the surface.		Operational and Decommissioning Phase	Mining Right area = 10 561.7 ha	<ul style="list-style-type: none"> During the operational phase appropriate temporary stormwater infrastructure must be developed and implemented, in accordance to Regulation 704. 	In line with the DWS Best Practice Guideline A6: Water Management for Underground Mines.	Commissioning and Operational Phase throughout the Life of Mine and after closure
						This is in compliance with GN.704 under the NWA (1998) as well as the DWS Best practice Guideline G1: Storm Water Management.	Commissioning and Operational Phase



Environmental component	Activity	PHASE Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure.	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m ²)	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
				<ul style="list-style-type: none"> Prevent or contain contamination from spilling and oil leaks from vehicles, equipment and drill rigs. 	In compliance with the DWS Best Practise Guidelines with specific reference to BPG H2 Pollution Prevention and Minimisation of Impacts.	Throughout the Life of Man
				<ul style="list-style-type: none"> Commissioning activity management should ensure that any materials handling does not pose a material risk to soil, surface water and groundwater pollution. 		Commissioning and Operational Phase throughout the Life of Mine
				<ul style="list-style-type: none"> A long-term goal may entail the establishment of a joint water management strategy with mines in the region and possible treatment capacity. 	-	Life of Mine and after Closure
				<ul style="list-style-type: none"> Reduce water inflow into shafts through efficient stormwater management. 	This is in compliance with GN.704 under the NWA (1998) as well as the DWS Best practice Guideline G1: Storm Water Management.	Commissioning and Operational Phase throughout the Life of Mine until such a time that the shaft is sealed.
Decommissioning and closure of the underground workings, shafts and associated infrastructure and well as the shaft surface area.	Decommissioning and Closure Phase		Shaft 7 = 11.7 ha Shaft 6 = 1.4 ha Shaft 5 = 40.3 ha Shaft 4 = 35.0 ha Shaft 3 = 7.5 ha Shaft 2 = 29.0 ha Shaft 1 = 7.6 ha	<ul style="list-style-type: none"> Water levels within the basins should be held at or below the relevant environmental critical levels (ECLs) through pumping of water. 	In compliance with the DWS Best Practise Guidelines with specific reference to BPG H2 Pollution Prevention and Minimisation of Impacts.	Life of Mine continuing after Closure
				<ul style="list-style-type: none"> Improved monitoring of mine water, groundwater, surface water, subsidence and other geotechnical impacts of mine flooding and seismicity is required. 	In line with the DWS Best Practice Guideline A6: Water Management for Underground Mines as well as the MPRDA (2002).	Life of Mine continuing after Closure
				<ul style="list-style-type: none"> No.2 Shaft: <ul style="list-style-type: none"> Implement storm water diversion measures at the shaft area to prevent ingress of surface runoff into the shaft during heavy rainfall events. Areas where surface water retention takes place should be minimised to encourage free drainage of surface water towards the downstream environment. 	This is line with the DWS Best Practice Guidelines G1 and H2, for storm water management, to prevent and minimise impacts and to ensure the	Commissioning and Operational Phase continuing for the Life of Mine
Sensitive landscapes	Mining and mining related activities conducted within the shaft areas.	Operational and Decommissioning Phase	Shaft 7 = 11.7 ha Shaft 6 = 1.4 ha Shaft 5 = 40.3 ha Shaft 4 = 35.0 ha Shaft 3 = 7.5 ha Shaft 2 = 29.0 ha	<ul style="list-style-type: none"> No.2 Shaft: <ul style="list-style-type: none"> Implement storm water diversion measures at the shaft area to prevent ingress of surface runoff into the shaft during heavy rainfall events. Areas where surface water retention takes place should be minimised to encourage free drainage of surface water towards the downstream environment. 	This is line with the DWS Best Practice Guidelines G1 and H2, for storm water management, to prevent and minimise impacts and to ensure the	Commissioning and Operational Phase continuing for the Life of Mine



Environmental component	Activity	PHASE Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure.	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m ²)	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			Shaft 1 = 7.6 ha	<ul style="list-style-type: none"> ○ Obstructions within current storm water trenches should be removed to promote free drainage of the No.2 Shaft area. <ul style="list-style-type: none"> • No.3 Shaft: <ul style="list-style-type: none"> ○ It is imperative that the No.3 Shaft area be rehabilitated to ensure free drainage of surface flow towards the downstream environment. ○ Vegetation growth should be promoted to reduce the possibility of erosion of exposed areas. ○ Obstructions within current storm water trenches should be removed to promote free drainage of the Shaft #3 area. • No.4 Shaft: <ul style="list-style-type: none"> ○ Implement storm water diversion measures at the shaft area to prevent ingress of surface runoff into the shaft during heavy rainfall events. ○ Areas where surface water retention takes place should be minimised to encourage free drainage of surface water towards the downstream environment. ○ Obstructions within current storm water trenches should be removed to promote free drainage of the Shaft #4 area. • Prior to the commencement of operations at the No.2 Shaft, the No.3 Shaft and the No.4 Shaft, a wetland delineation and Impact Assessment should be conducted to accurately delineate any wetlands within the vicinity, determine the Present Ecological Status (PES) and the Ecological Importance and Sensitivity (EIS) of the wetlands, to determine the potential impacts that may occur and to present possible mitigation measures for these impacts. 	separation of clean and dirty water management areas.	
Air quality	The operation and utilization of the fans to remove stale air from the underground working.	Operational Phase	Approximate combined surface area of all fan surface areas: 2 750 m ² . Orkney fan: 700 m ² .	<ul style="list-style-type: none"> • An air quality monitoring programme should be implemented to determine the quality of the air being released from the fans. This will also aid in determining the necessity for an Air Emissions Licence in terms of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004). • Should it be found that potentially harmful emissions are being released from the fans, operations of the fans should cease and the appropriate actions taken. 	Air quality and dust fallout monitoring will determine if the minimum thresholds as stipulated in the NEM:AQA (2004) and regulation thereunder are not exceeded. Should they be exceeded the	Commence prior to the Commissioning and Operational Phase, for the Life of Mine Immediate action to be conducted if necessary



Environmental component	Activity	PHASE Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure.	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m ²)	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
	Hauling of mined ore to the Nicolor South Plant.	Operational Phase	Veldt fan: 450 m ² . Kanana Vent Duct: 1600 m ² . 18 km		appropriate actions will be undertaken an Atmospheric Emissions Licence will be applied for. This is in compliance with the MPRDA (2002), the NEM:AQA (2004) and the Mine Health and Safety Act (1996).	
				<ul style="list-style-type: none"> All loaded haul trucks are to remain covered during the transportation. 	In compliance with the National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004) and the National Dust Control regulations thereunder.	Operational Phase
				<ul style="list-style-type: none"> All machinery, vehicles and haul trucks should be inspected and serviced on a regular basis. 		Throughout the Life of Mine
				<ul style="list-style-type: none"> An air quality and dust fallout monitoring programme will be implemented and will be continued through the Decommissioning and Rehabilitation Phases. 	Air quality and dust fallout monitoring will determine if the minimum thresholds as stipulated in the NEM:AQA (2004) and regulation thereunder are not exceeded. Should they be exceeded the appropriate actions will be undertaken an Atmospheric Emissions Licence will be applied for. This is in compliance with the MPRDA (2002), the NEM:AQA (2004) and the Mine Health and Safety Act (1996).	Commissioning and Operational Phase throughout the Life of Mine until Closure



Environmental component	Activity	PHASE Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure.	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m ²)	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
				<ul style="list-style-type: none"> Rehabilitated areas will be inspected on a regular basis for evidence of erosion and should erosion occur, the appropriate actions will be taken. 	In line with Regulation 70 of the Mineral and Petroleum Resources Development Regulation, GNR587 (2004).	On-set of Rehabilitation until rehabilitation is complete
				<ul style="list-style-type: none"> The declared weed and invader plant management plan will continue to be implemented during the Decommissioning and Rehabilitation Phase. 	In compliance with the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	Commissioning and Operational Phase throughout the Life Mine until rehabilitation is complete
Noise ²¹	The reinstatement of operations at the CAPM Orkney Gold Mine No.7 Shaft and No.6.	Commissioning and Operational Phase	Shaft 7 = 11.7 ha Shaft 6 = 1.4 ha	<ul style="list-style-type: none"> Effective maintenance of the vehicle engines and exhaust systems. 	In compliance with the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004).	Commissioning and Operational Phase throughout the Life Mine until mine closure
				<ul style="list-style-type: none"> Hearing conservation programme as per DMR guidelines on Noise Control. 	In compliance with the Mine Health and Safety Act, 1996 (Act No. 29 of 1996) and the DMR guidelines for noise control.	
				<ul style="list-style-type: none"> Zoning of high noise areas. 		
				<ul style="list-style-type: none"> The use of approved hearing protection devices for personnel working in close proximity of the workings. 		
	<ul style="list-style-type: none"> Incorporate sound attenuation measures to any equipment that could generate noise levels in excess of the statutory limits as published by the Department of Mineral and Energy. 	Commissioning and Operational Phase, and as required				
The care and maintenance of the No.1 to No.5 shafts until such a time that they are prepared from operations or decommissioned and rehabilitated.	Operational and Decommissioning Phase	Shaft 5 = 40.3 ha Shaft 4 = 35.0 ha Shaft 3 = 7.5 ha Shaft 2 = 29.0 ha Shaft 1 = 7.6 ha	From an occupational perspective the mine workers should be protected through standards and procedures and the personal exposure levels should be monitored as part of the legal requirements of Section 12 of the MHSA.	Commissioning and Operational Phase		

21 Note: The impacts, significance and respective mitigation measure were obtained from the environmental noise impact assessment report. Refer also to Annexure C5 of the EIA / EMPr document.



Environmental component	Activity		PHASE	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m ²)	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure.				
Visual aspects	The reinstatement of operations at the CAPM Orkney Gold Mine Shaft areas.		Operational and Decommissioning Phase	Shaft 7 = 11.7 ha Shaft 6 = 1.4 ha Shaft 5 = 40.3 ha Shaft 4 = 35.0 ha Shaft 3 = 7.5 ha Shaft 2 = 29.0 ha Shaft 1 = 7.6 ha	<ul style="list-style-type: none"> Reduce the visual intrusion as far as possible. 	-	Commissioning and Operational Phase
Site of archaeological and cultural importance ²²	No.3 Shaft	The decommissioning and removal of infrastructure and the rehabilitation of the surface area of the No.3 Shaft.	Operational Phase	Shaft 3 = 7.5 ha	<ul style="list-style-type: none"> The Heritage authorities should be approached to evaluate the impact and to provide the appropriate mitigation procedures to be followed. 	In compliance with the National Heritage Resources Act, 1999 (Act No. 25 of 1999).	Immediate action required
	No.7 Shaft	The decommissioning and removal of infrastructure workshops at the No.7 Shaft.	Commissioning and Operational Phase	Five (5) workshops	<ul style="list-style-type: none"> Proposed impact must be mitigated by application for demolition permit/s. 		Prior to the decommissioning of any infrastructure protected under the NHA, 1999.
Socio-economic aspects	The commencement of operations at the No.6 and the No.7 Shafts.		Operational Phase	Shaft 7 = 11.7 ha Shaft 6 = 1.4 ha	<ul style="list-style-type: none"> As many skilled and unskilled workers, as possible, should be sourced from the local communities, towns and surrounding areas. 	In compliance with the mines SLP and the DMR guideline for a SLP.	Commissioning and Operational Phase continuing as and when required.
	Mine closure.		Decommissioning and Closure Phase	Shaft 7 = 11.7 ha Shaft 6 = 1.4 ha Shaft 5 = 40.3 ha Shaft 4 = 35.0 ha Shaft 3 = 7.5 ha Shaft 2 = 29.0 ha Shaft 1 = 7.6 ha Loss of 471 jobs	<ul style="list-style-type: none"> Several mitigations against the effects of job loss have been provided for in the CAPM Orkney Gold Mines SLP (attached to the EIA and EMPr as Annexure G), and include the following: <ul style="list-style-type: none"> Education. Training. Skills development and training (portable skills, core business skills). Mentorships. Learnerships. Bursaries (internal and external). 		During the operational Phase to prepare employees for Closure
	The commencement of operations at the No.6 and the No.7 Shafts and eventually the No.4 Shaft and No.1 Shaft.		Commissioning and Operational Phase	Shaft 7 = 11.7 ha Shaft 6 = 1.4 ha Shaft 4 = 35.0 ha Shaft 2 = 29.0 ha	As many skilled and unskilled workers, as possible, should be sourced from the local communities, towns and surrounding areas.		Commissioning and Operational Phase continuing as and when required.

²² Note: The impacts, significance and respective mitigation measure were obtained from the cultural heritage impact assessment report. Refer also to Annexure C6 of the EIA / EMPr document



Environmental component	Activity		PHASE Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure.	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m ²)	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
Hazards to community	The commencement of operations at the No.6 and the No.7 Shafts and eventually the No.4 Shaft and No.1 Shaft.		Operational and Decommissioning Phase	Shaft 1 = 7.6 ha Shaft 7 = 11.7 ha Shaft 6 = 1.4 ha Shaft 4 = 35.0 ha Shaft 2 = 29.0 ha Shaft 1 = 7.6 ha	<ul style="list-style-type: none"> Only trained employees will operate machinery and equipment. 	In compliance with the Mine Health and Safety Regulations under the Mine Health and Safety Act (1996).	Life of Mine
					<ul style="list-style-type: none"> The Emergency Preparedness and Response Procedure, as well as all other related procedures will be in place prior to the commencement of any activities. 		Commissioning Phase, prior to the commencement of Operational Phase activities
					<ul style="list-style-type: none"> All employees will be trained on the possible hazards of the tasks to undertaken, be aware of the contents of all related Standard Operating Procedures and be trained on the appropriate action to be conducted in the event of an emergency. 		Prior to the commencement of Operational Phase activities and on a regular basis for the Life of Mine
					<ul style="list-style-type: none"> Firefighting equipment will be readily available on all sites. 		
					<ul style="list-style-type: none"> All hazardous substances, chemicals and hydrocarbon material shall be stored in designated facilities and access controlled in order to prevent unauthorized access. 		Commissioning Phase, for the Life of Mine.
					<ul style="list-style-type: none"> All areas in which hazardous substances, chemical and hydrocarbon materials are stored will be inspected on regular basis. 		
			Commissioning, Operational and decommissioning Phase	<ul style="list-style-type: none"> All explosives (to be stored under underground) shall be stored in designated facilities with strict access control. 	In compliance with the Mine Health and Safety Regulations under the Mine Health and Safety Act (1996).		
				<ul style="list-style-type: none"> All shaft surface areas will have strict access control in the form of fences, gates and security and warning signs indicating the hazard of entering the site will be placed at all shafts. 	This is in compliance with section 5 of the Mine Health and Safety Act (1996).	Commissioning and Operational Phase and remain for the Life of Mine	
				<ul style="list-style-type: none"> During the Decommissioning Phase, the shafts will be appropriately plugged and sealed. 	-		



Environmental component	Activity		PHASE Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure.	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m ²)	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			Operational Phase		<ul style="list-style-type: none"> All mine vehicles, including the haulage trucks, will be inspected and service on a regular basis to ensure roadworthiness. All drivers of the vehicles shall be possession of a valid driver's licence, specifically for the class of vehicle being operated. The general traffic rules and speed limits shall be obeyed when utilising public roads. All traffic rules and speed limits within the shaft areas shall be obeyed. 	In compliance with the National Road Traffic Act, 1996 (Act No. 93 of 1996) and the regulations thereunder.	Operational Phase for the Life of Mine
			Commissioning, Operational and Decommissioning Phase		<ul style="list-style-type: none"> A detailed asbestos survey shall be kept at all times. A detailed asbestos handling, storage and disposal procedure shall be compiled and implemented. An appropriate monitoring programme shall be developed and implemented to ensure that the handling, storage and disposal of radio-active contaminated materials and equipment complies with the conditions of the Nuclear Licence. All information shall be reflected within the quarterly NNR Report. 	In line with the Asbestos Regulations R155 (2002) under the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993). In compliance with the Hazardous Substances Act, 1973 (Act No. 15 of 1973), the Nuclear Energy Act, 1999 (Act No. 46 of 1999) and the Nuclear Licence.	Life of Mine Commissioning Phase Commissioning Phase prior to the commencement of Operational Phase activities On-going basis for the Life of Mine



9. Impact Management Outcomes

Table 14: Impact management outcomes, identifying the stand of impact management required for the identified aspects

Aspects affected	Activity	Potential impact	Phase Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure.	Mitigation type	Standards to be achieved
Geology	The underground deep level mining of gold bearing ore.	The underground deep level mining requires the blasting and removal of rock in the further sinking of the shafts as well as for the extraction of narrow generally flat dipping gold reefs. This, including the removal of the ore to the surface for processing at the Nicolor South Plant will lead to the permanent destruction of the localised geological strata.	Operational Phase	Control measures will be implemented to prevent the unnecessary destruction of geological strata.	Avoid the further destruction of the geological strata.
Soil	Commencement mining activities at within the various shaft areas.	Although the majority of the shaft areas are lined with cement, there are areas within and adjacent to the shaft boundary which comprise of natural vegetation and secondary grasslands. The soil within these areas may therefore be negatively impacted upon should any mining related activities be conducted on these areas.	Operational and Decommissioning Phase	Control measures will be implemented to prevent activities from being undertaken within these areas.	Avoid impacts on the soil, associated with and adjacent to, the shaft areas.
	Hydrocarbon, chemical and waste materials spillages	Hydrocarbon and chemical spills may pollute soils within the area either through direct contact or indirectly through the contamination of surface water runoff. Similarly unsorted and improper storage of general waste, building rubble or equipment contaminated with radioactive material may contaminate soil either through direct contact or indirectly through the contamination of surface water runoff.	Operational, Decommissioning and Closure Phase	Storm water control measures will be upgraded or implemented and remediation measures will be implemented to contain any spills	Avoid impacts on soil and should they occur, remediate the spill and resultant impact.
	Decommissioning of the shafts and related infrastructure and rehabilitation of the disturbed footprint areas.	The decommissioning of the shafts and removal of infrastructure will result in the exposure of soil to the elements, resulting in erosion of the soil. This will not only impact on the fertility of the soil but may have an impact on the surface water quality, fauna and flora and sensitive landscapes.	Decommissioning and Closure Phase	Control measures will be implemented to prevent / stop soil erosion.	The impact will be avoided and stopped should it occur.
Land use and land capability	Decommissioning and rehabilitation of all shaft areas and closure of the mine.	It is important to note that the CAPM Orkney Gold Mine is an existing gold mine and has previously been operational. Therefore it is not anticipated that the re-commencement of the mining activities will have a further impact on the land use and land capability. However, during decommissioning and closure, all unnecessary infrastructure will be demolished and the surface area rehabilitated to the agreed upon end land use. Therefore a positive impact may be experienced as the land use may change from mining to agriculture or wilderness.	Decommissioning and Closure Phase	Remediation measures will be implemented to return the land to an agreed upon end land use.	Land use to be returned to, depending on final agreements with the DMR and municipalities, agricultural or wilderness.
	Operational activities and care and maintenance activities to be conducted at the No.6 and No.7 Shafts and the No.1 to No.5 Shafts, respectively.	<i>Boophone disticha</i> is a plant species with a conservation status of "Declining". The habitat of this plant species is dry grasslands and rocky areas and is widespread in South Africa and extends up the eastern half of southern Africa to Uganda. This plant species was identified within the untransformed grassland	Operational and Decommissioning Phase	Control measures will be implemented to prevent the disturbance and destruction of the	Impacts on the surrounding vegetation will be avoided.



Aspects affected	Activity	Potential impact	Phase Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure.	Mitigation type	Standards to be achieved
Flora ²³		<p>areas adjacent to the No.7 Shaft. It was also identified that <i>Pearsonia bracteata</i> and <i>Drimia sanguinea</i> could also occur in this area owing to the presence of the suitable habitat. No mining activities will be conducted outside of the underground Mining Right area or the Surface Rights area of the shaft, therefore it is not anticipated that the proposed mining activity at the No.7 Shaft will impact on these species. However in the even that any activities are conducted outside of the shaft boundary area, these species may be impacted upon. Dust, generated from the loading and hauling of the ore, may also settle on the vegetation in this area and may impact on the growth and photosynthesis and transpiration processes of the vegetation.</p> <p>Only three species protected under Schedule 11 of the Transvaal Nature Conservation Act (No.12 of 1983), namely <i>Babiana hypogea</i>, <i>Gladiolus permeabilis</i> and <i>Crinum graminicola</i> were recorded from untransformed grassland (corresponding to shaft footprints #4 and #5) on the study area.</p>		natural vegetation and species of conservation concern.	
		<p>The decommissioning of the shafts and removal of infrastructure will result in the exposure of soil to the elements, resulting in erosion of the soil. This will not only impact on the fertility of the soil but may have an impact on the surface water quality, fauna and flora and sensitive landscapes.</p>	Decommissioning and Closure Phase	Control measures will be implemented to prevent / stop soil erosion.	Impacts will be avoided through the prevention and remediation of soil erosion.
		<p>A number of weeds and invader plant species were identified within the study area. These weeds and invader plant species established on disturbed areas have a tendency to dominate or replace the canopy herbaceous layer of natural ecosystems, thereby transforming the structure, composition and function of natural ecosystems.</p>	Operational, Decommissioning and Closure Phase	Control measure will be implemented to prevent the establishment and spread of weeds and invader species.	Impacts will be avoided through the establishment of management programmes.
Fauna ²⁴	Operational activities and care and maintenance activities to be conducted at the No.6 and No.7 Shafts and the No.1 to No.5 Shafts, respectively.	<p>The study area provides potential habitat for 10 mammal taxa of conservation concern, of which, the following species may occur:</p> <ul style="list-style-type: none"> • Brown Hyaena. • Honey Badger. • South African Hedgehog. • Shrews. • Black-footed cat. 	Operation, Decommissioning and Closure Phase	Control measure will be implemented to prevent the destruction of the natural habitats.	The impacts will be avoided.

23 Note: The impacts, significance and respective mitigation measure were obtained from the baseline botanical and faunal biodiversity survey. Refer also to Annexure C3 of the EIA / EMPr document.

24 Note: The impacts, significance and respective mitigation measure were obtained from the baseline botanical and faunal biodiversity survey. Refer also to Annexure C3 of the EIA / EMPr document.



Aspects affected	Activity	Potential impact	Phase Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure.	Mitigation type	Standards to be achieved
		<p>Due to the increased human presence in the area and observation within the study area, both the Brown Hyaena and the Black-footed Cat are said to be irregular in occurrence within the study area. The Honey badger as well as the south African hedgehog are however expected to occur within the study area due to their tolerance to modified habitat types.</p> <p>The bird species of conservation concern are likely to occur within the study area and include:</p> <ul style="list-style-type: none"> • The Melardious Lark (<i>Mirafra cheniana</i>). • The near threatened Abdim's stork (<i>Ciconia abdimii</i>). • The vulnerable Lanner Falcon (<i>Falco biarmicus</i>). <p>The Abdims Stork and the Lanner Falcon were not recorded during the site survey but are classified as likely to occur within the study area. The Melardious Lark was however recorded within the study area during the site survey. 23 other species are sympatric to the study area however they are either irregular visitors to the area or unlikely to be present due to the absence of suitable habitats.</p> <p>Animals within the study area and adjacent to the mine may be hunted and poached, by employees, for food.</p>			
		<p>Animal injury and / or death may result from animal life accessing the mine shaft areas as well as by collisions with vehicles and machinery on and off site.</p>	Operational and Decommissioning Phase	Control measure will be implemented to prevent unauthorised access to the site and to prevent animals from entering the site.	The impacts on animal life will be avoided.
		<p>Noise generated from mining activities may scare animal life in the vicinity and lead to migration away from the area and possibly even injury and death.</p>	Operational and Decommissioning Phase	Control measure will be implemented to prevent the generation of noise and remediation measure will be implemented in the event that undesired noise is generated.	Noise levels will be managed and reduced as far as possible.
Surface water ²⁵	No.1 Shaft	<p>Operation of winder cooling ponds.</p> <p>The winder cooling ponds are concrete ponds situated next to one of the winder houses and in close proximity of the clean runoff channels. These ponds contain process water used for cooling purposes.</p> <p>Surface water quality:</p>	Operational Phase	Storm water management measure will be implemented / upgraded to prevent the discharge of contaminated surface water.	Impact will be avoided through the implementation of appropriate storm water management measures.

²⁵ Note: The impacts, significance and respective mitigation measure were obtained from the conceptual Storm Water Management Plan Specialist Report. Refer also to Annexure C2 of the EIA / EMPr document



Aspects affected	Activity	Potential impact	Phase Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure.	Mitigation type	Standards to be achieved
		Overflow of winder cooling ponds may lead to affected water discharge into the clean surface runoff channels situated next to the cooling ponds and may result in deterioration in quality of surface water runoff from the Shaft #1 area.			
	Storage and handling of hydrocarbon containers.	Surface water contamination may take place as a result of leaking hydrocarbon containers stored outside of designated areas.	Operational and Decommissioning Phase	Control and remediation measures will be implemented to prevent the contamination of surface water runoff.	Spillages will be avoided and remediation activities implemented where spillages have occurred.
	Containment of affected water.	Overflow from the containment sump underneath the conveyor system may lead to deterioration of clean surface water quality in the immediate vicinity of the Shaft #1 area.	Operational Phase	Storm water management measure will be implemented / upgraded to prevent the discharge of contaminated water.	Impacts will be avoided through the implementation of appropriate storm water management infrastructure.
No.2 Shaft	Uncontrolled surface water runoff.	There are no current diversion measures to prevent surface runoff from flowing into Shaft #2. Runoff retention also takes place inside previously constructed containment facilities.	Operational and Decommissioning Phase	Storm water management measure will be implemented.	Impacts will be avoided through the implementation of appropriate storm water management infrastructure.
No.3 Shaft	Rehabilitation of the No.3 Shaft area.	Closure phase: Incorrect rehabilitation techniques may result in exposed areas and areas that will prevent drainage of storm water runoff towards the downstream environment.	Decommissioning and Closure Phase	Control measures and rehabilitation monitoring programmes will be implemented to ensure that rehabilitation is conducted in the appropriate manner.	Appropriate rehabilitation strategies to be implemented. Storm water management infrastructure will remain until all dirty water management areas are rehabilitated.
No.4 Shaft	Uncontrolled surface water runoff	There are no current diversion measures to prevent surface runoff from flowing into Shaft #4. Runoff retention also takes place inside previously constructed containment facilities within the shaft operations area.	Operational and Decommissioning Phase	Storm water management measure will be implemented.	Impacts will be avoided through the implementation of appropriate storm water management infrastructure.
No.5 Shaft	Sewage management	A sewage sump is located next to a clean storm water diversion channel downstream of the Shaft #5 hostel area. Mine personnel has indicated that there were previous incidents in which the sump's capacity was reached and sewage entered the clean storm water conveyance channel.	Operational and Decommissioning Phase	Storm water management measures will be implemented to contain spillages from the sump and divert clean surface water runoff away from the area.	The impacts will be avoided through the implementation of monitoring programmes (monitoring of capacity of the sump) and the implementation and upgrading of the Storm water management infrastructure.
No.6 Shaft	Uncontrolled storm water runoff	There are no current diversion measures to prevent surface runoff from flowing into Shaft #6.	Operational Phase	Storm water management measures will be implemented.	Impacts will be avoided through the implementation of appropriate storm water management infrastructure.
	Wash bay operation	The wash bay will be used as a designated area to clean equipment and currently not fitted with an oil separator. This facility is not connected to a dirty water system and therefore wash water is pumped out and discharged into the adjacent veldt during operations.	Operational and Decommissioning Phase	Storm water management measures and control measures will be implemented to prevent the discharge of contaminated surface water runoff.	Impacts will be avoided through the implementation of appropriate storm water management infrastructure.



Aspects affected	Activity		Potential impact	Phase Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure.	Mitigation type	Standards to be achieved
			Surface water quality: Should any wash water be discharged from the wash bay in its current status, discharge of hydrocarbon contaminated water will take place in the surrounding clean water environment.			
	No.7 Shaft	Chemical and hydrocarbon management	<p>The main storm water channel is located next to a hydrocarbon and chemical storage area. Any chemical and hydrocarbon containers as well as equipment (operated using grease) stored outside of a designated area creates a risk of surface water pollution. Contaminated runoff as a result of poor housekeeping practises will enter the clean storm water diversion trench towards the adjacent veldt area.</p> <p>Surface water quality: The quality of surface runoff generated within the Shaft #7 area may be deteriorated as a result of contact with hydrocarbons such as oil and grease.</p>	Operational and Decommissioning Phase	Control and storm water management measures will be implemented to prevent the contamination of clean surface water runoff	Impacts will be avoided through the implementation of appropriate storm water management infrastructure.
		Wash bay operation	<p>The wash bay will be used as a designated area to clean radio-active contaminated equipment. This facility is connected to a dirty water system and wash water is pumped to the adjacent plant and used as part of the process water system. Should an incident occur, radio-active wash water may be discharged towards the clean storm water channel.</p> <p>Surface water quality: Discharge of contaminated water from the wash bay at Shaft #7 may lead to a significant deterioration of surface water quality towards the downstream clean water environment.</p>	Operational and Decommissioning Phase	Control and storm water management measures will be implemented	Impacts will be avoided through the implementation of appropriate storm water management infrastructure.
		Sump operation underneath conveyor	<p>A sump has been constructed underneath the conveyor system next to Shaft #7. The purpose of this sump is to contain any seepage from the damp ore material hoisted from underground. This sump is fitted with pumping infrastructure towards the adjacent plant as part of the process water system. There is a risk that overflow into the main storm water channel might occur as a result of pump failure.</p> <p>Surface water quality: Discharge of contaminated water from the sump may result in deterioration of clean surface water runoff towards the adjacent clean water environment.</p>	Operational Phase	Storm water management measures will be implemented / upgraded to prevent the discharge of contaminated water.	Impacts will be avoided through the implementation of appropriate storm water management infrastructure.
Groundwater	Dewatering of the shafts for the safe continuation of mining.		During the operational phase groundwater will be dewatered to the bottom of the Vaal Contact Reef which will result in dewatering of the surrounding aquifer. However, the transient modelling exercise showed that the cone of depression is limited in extent with no boreholes included within its influence zone.	Operational Phase	Control measure will be implemented.	Impacts will be avoided through the supply of water to those affected, should it be required.



Aspects affected	Activity	Potential impact	Phase Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure.	Mitigation type	Standards to be achieved
	The underground deep level mining of gold bearing ore, including the associated activities conducted on the surface.	The impacts on groundwater quality are primarily related to the management of materials, wastes and spills from drilling operations and unauthorised disposal of contaminated substances. Contamination of groundwater may also arise due to incorrect handling and disposal of waste materials, the physical drilling process (sludge contains oils and greases) and oil leaks from drill rigs. This risk is considered low. Groundwater quality impacts may also arise from seepage from the recycle dam underground, although this is considered a low impact since the dam will be lined. The general risk towards groundwater quality deterioration is considered low.	Operational and Decommissioning Phase	Control measures will be implemented to prevent the contamination of groundwater resources.	The impacts will be avoided and where spillages have occurred, will be remediate as a soon as possible.
	Decommissioning and closure of the underground workings, shafts and associated infrastructure and well as the shaft surface area.	During the closure phases when all pumping within the region has ceased, the water in the shaft/s may rise towards the Environmentally Critical Level (ECL) where, if contaminated and affected by AMD reactions, may pollute aquifers or surface drainages. The rate at which, and up to which point the water will rise is highly complex and unknown given the multitude of parameters and dewatering schemes within the KOSH area. However previous studies in the KOSH area indicate a likely probability of decant and rise to pre-mining conditions and the ECL. However, at the CAPM 7 Shaft the groundwater table is not expected to return to pre - mining conditions. The reason being that decant will occur at 40 Level, creating a permanent dewatering cone towards 4 Shaft. The quality of the decant water is expected to be contaminated but will improve over time as existing areas of exposed sulphide mineralisation are flooded or oxidised.	Decommissioning and Closure Phase	Control measure will be implemented.	Impacts will be avoided through the implementation of control measures.
Sensitive landscapes	Mining and mining related activities conducted within the shaft areas.	An assessment was conducted against the NFEPA classified wetlands and the proximity of these wetlands to the CAPM Orkney Gold Mine shaft areas. As described in Chapter H of Part 7.4.1 (Part A – Environmental Impact Assessment) of the EIA and EMP, three (3) NFEPA classified wetland areas have been identified to be in close proximity to the No.2 Shaft (unchannelled valley bottom wetland), the No.3 Shaft (channelled Valley Bottom Wetland) and the No.4 Shaft (flat wetland area). The operational activities to be conducted within the vicinity of shaft areas may impact on these wetland areas in terms of surface water quality, fauna, flora and soil aspects (refer also to Part 4.2, Part 4.5, Part 4.6 and Part 4.7). It is however important to note that these shafts are not currently operational as the No.7 and No.6 Shaft will be the first shafts to	Operational and Decommissioning Phase	Control and storm water management measures will be implemented.	The impacts will be avoided through the implementation of appropriate storm water management measures.



Aspects affected	Activity	Potential impact	Phase Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure.	Mitigation type	Standards to be achieved
		commence with operations and operations at the No.3 Shaft will not commence as the No.3 Shaft area is in the process of being rehabilitated.			
Air quality	The operation and utilization of the fans to remove stale air from the underground working.	The operation and utilisation of the Kanana Vent Duct, No 6 Shaft Veld Fan and the No 7 Shaft Main Fan may result in the release of potentially harmful pollutants and emissions into the air, from the underground workings. This may potentially affect the health of the residents in the area.	Operational Phase	A monitoring programme will be implemented.	Impact will be identified through the monitoring of the air quality and dust and therefore avoiding potential impacts through the implementation of appropriate actions.
	Hauling of mined ore to the Nicolor South Plant.	As described above, the ore mined at the CAPM Orkney Gold Mine will be transported, via haulage trucks, to the Nicolor South Plant for processing utilising the formal road network. The transportation of the ore may therefore result in the generation of dust that may have an impact on the local air quality.	Operational Phase	A monitoring programme and control measures will be implemented.	
		As described above, the ore mined at the CAPM Orkney Gold Mine will be transported, via haulage trucks, to the Nicolor South Plant for processing utilising the formal road network. Emissions from the haulage trucks may have a minor impact on the localised air quality.	Operational Phase	Control measure will be implemented.	
Noise ²⁶	The reinstatement of operations at the CAPM Orkney Gold Mine No.7 Shaft and No.6.	Currently the shafts are not producing and the noise levels are from normal background noise and activities originating from human interaction and vehicle. In the not too distant future these shafts will be re-opened and the prepared for production. This will include activities such as pumping of water and replacing structures that are worn and damaged. Through this process there will be a great deal of workshop and Commissioning activities and vehicle movement while the shafts and underground workings are prepared. Once operational again the main noise sources will be from the main surface fans and the normal shaft noises.	Implementation and Operational Phase	Control measure will be implemented.	Noise levels will monitored and control measure implemented to reduce the noise generation as far as possible.
	The care and maintenance of the No.1 to No.5 shafts until such a time that they are prepared from operations or decommissioned and rehabilitated.	These shaft will not be re-opened again for production. Normal care and maintenance will be carried on these shafts. Should there be any additional activities carried out, such as the breaking down of shaft structures and buildings, the noise levels should be monitored and the necessary control measures be introduced to minimise the impact on the community. Should operations commence at these shafts, the impacts as described above will apply.	Operational and Decommissioning Phase	Control measures will be implemented.	Noise levels will monitored and control measure implemented to reduce the noise generation as far as possible.
Visual aspects	The reinstatement of operations at the CAPM Orkney Gold Mine Shaft areas.	Although the CAPM Orkney Gold Mine is an existing mine and the community and regular visitors of the area are likely to be desensitised to the mining related infrastructure, the mine has been under care and maintenance since the year	Operational and Decommissioning Phase	Control measures will be implemented.	Visual Impacts will be avoided through the control of the generation of dust and emissions.

26 Note: The impacts, significance and respective mitigation measure were obtained from the environmental noise impact assessment report. Refer also to Annexure C5 of the EIA / EMPr document.



Aspects affected	Activity		Potential impact	Phase Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure.	Mitigation type	Standards to be achieved
			2010. Therefore, once operations at the shafts commence, the increased traffic and presence of employees as well as the increased generation of dust and emissions clouds from the machinery and vehicles may cause a visual disturbance. There are several sensitive receptors in both the foreground and middle ground that include residential areas and the town of Orkney.			
Site of archaeological and cultural importance ²⁷	No.3 Shaft	The decommissioning and removal of infrastructure and the rehabilitation of the surface area of the No.3 Shaft.	This site with traditional riveted steel headgear is dated to the end of the 1930's. CAPM Orkney Gold Mine removed all infrastructure (including the headgear) at the No.3 Shaft, without being in possession of a demolition permit. This site was demolished between the period of 2011 and 2015. The site is protected by section 34 (1) of Act 25 of 1999, and is rated as "General protection" A (Field Rating IV A) by the SAHRA minimum standards May 2007, therefore cannot be altered or destructed without a demolition permit issued by the relevant heritage authorities.	Operational Phase	Mitigation measures will be implemented and the correct procedure will be requested and followed.	The impact will be controlled through the following of the appropriate action as obtained of the Heritage Resource Authority.
	No.7 Shaft	The decommissioning and removal of infrastructure workshops at the No.7 Shaft.	This site with traditional riveted steel headgear is dated to the mid 1930's. It is possibly the most representative of the early period of mining in the region. Even so it reflects alterations and updating over time. Most of the site is still intact. The mining objectives of CAPM Gold states that the site will mainly be retained as-is. It will be maintained in its present format allowing for and according to modern mining safety regulations. It is the wish of CAPM Gold to demolish five historic buildings on the eastern perimeter of the site as these are superfluous to the proposed mining perspectives. It includes four steel framed and corrugated iron clad workshops and one brick walled, workshop with wooden trusses and corrugated iron roof. All five buildings are protected by section 34(1) of the National Heritage Act, Act 25 of 1999. These are all rated as "General protection" A (Field Rating IV A) by the SAHRA minimum standards May 2007, therefore cannot be altered or demolished without a demolition permit issued by the relevant heritage authorities.	Implementation and Operational Phase	Mitigation measures will be implemented by following the correct procedure and obtaining appropriate authorisations.	The impact will be avoided by obtaining the relevant permits.
Socio-economic aspects	The commencement of operations at the No.6 and the No.7 Shafts.		As described in the SLP (attached to the EIA and EMP as Annexure G), upon commencement of operations at the No.7 and the No.6 Shaft the CAPM Orkney Gold Mine will employ 471 individuals (total in fourth year of production) of which a minimum of 95% (with the exception of specialists) will be sourced from the local communities. This is a positive impact in terms of socio-economic aspects as not only will 471 individuals be employed but the community will also benefit	Operational Phase	Enhancement measures will be implemented.	The positive impact will be enhanced.

²⁷ Note: The impacts, significance and respective mitigation measure were obtained from the cultural heritage impact assessment report. Refer also to Annexure C6 of the EIA / EMP document



Aspects affected	Activity	Potential impact	Phase Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure.	Mitigation type	Standards to be achieved
		indirectly through the increased spending on goods and services, the use of local sub-contractors, as well as leading to a decrease in unemployment of the area.			
	Mine closure.	At the end of the Operational Phase of the Orkney Gold Mine, mining operations will cease and the mine will prepare for decommissioning and closure. Rehabilitation activities will commence, depending on the agreed upon end land, and infrastructure will be removed. During this phase a loss of jobs will occur as the amount of employees required during the Operational Phase will no longer be required.	Decommissioning and Closure Phase	Control measures will be implemented.	
	The commencement of operations at the No.6 and the No.7 Shafts and eventually the No.4 Shaft and No.1 Shaft.	The commencement of operations at the CAPM Orkney Gold Mine may lead to an influx of job seekers to the area. As stipulated in the SLP of the mine, the mine will employ 471 individuals (total in the fourth year of production), of which a minimum of 95% (with the exception of specialists) will be sourced from the local community. The influx of job seekers to the area may result in several social impacts due to the limited job supply and includes: <ul style="list-style-type: none"> • An increase in theft / crime. • An increase in informal settlements. • Potential spread of HIV / AIDS. 	Commissioning and Operational Phase	Control measures will be implemented.	The impact will be controlled through the implementation of the activities as stipulated in the SLP.
Hazards to community	The commencement of operations at the No.6 and the No.7 Shafts and eventually the No.4 Shaft and No.1 Shaft.	Due to the close proximity of the shaft areas to residential areas (Orkney, Kanana, Stilfontein, Vaal Reefs), the storage of hazardous materials and chemicals, gas cylinders and welding and cutting equipment poses a hazard to the safety of the community.	Operational and Decommissioning Phase	Control measures will be implemented to prevent the exposures of the community to unnecessary hazards.	Impact will be avoided through the implementation of control measures.
		The shaft areas pose a hazard to the community and fauna in the area as all operational shafts will be open until such a time that decommissioning commences and the shafts are sealed.	Commissioning, Operational and decommissioning Phase	Control measures will be implemented to prevent the exposures of the community to unnecessary hazards.	Impact will be avoided through the implementation of control measures.
		All ore mined at the CAPM Orkney Gold, as described above, will be transported approximately 18 km to the Nicolor South Plant for processing and treatment. There CAPM Orkney Gold Mine proposes to utilise haulage trucks for transportation purposes. This poses a hazard to the community and local residents as the number of mine vehicles will increase on the roads which are used by the local community and residents.	Operational Phase	Control measures will be implemented to prevent the exposures of the community to unnecessary hazards.	Impact will be avoided through the implementation of control measures.
		The generation of waste on the mine, including asbestos and potential radiation contaminated equipment may result in health hazard to the local community.	Commissioning, Operational and Decommissioning Phase	Control measures will be implemented to prevent the exposures of the community to unnecessary hazards.	Impact will be avoided through the implementation of control measures.





10. Impact Management Actions

Table 15: Impact management actions, identifying the manner in which the impact management objectives and outcomes will be achieved.

Activity	Potential Impact	Mitigation type	Time period for implementation	Compliance with standards
The underground deep level mining of gold bearing ore.	The underground deep level mining requires the blasting and removal of rock in the further sinking of the shafts as well as for the extraction of narrow generally flat dipping gold reefs. This, including the removal of the ore to the surface for processing at the Nicolor South Plant will lead to the permanent destruction of the localised geological strata.	Control measures will be implemented to prevent the unnecessary destruction of geological strata.	Commissioning and Operational Phase throughout the Life of Mine.	In compliance with the Mining Right issued in terms of the MPRDA (2002) and the Environmental management Programme.
Commencement mining activities at within the various shaft areas.	Although the majority of the shaft areas are lined with cement, there are areas within and adjacent to the shaft boundary which comprise of natural vegetation and secondary grasslands. The soil within these areas may therefore be negatively impacted upon should any mining related activities be conducted on these areas.	Control measures will be implemented to prevent activities from being undertaken within these areas.	Commissioning and Operational Phase	The prevention of the release of contaminated surface water is in line with the objectives of the DWS Best Practices Guideline H2: Pollution Prevention and Minimization of Impacts
				The demarcation will allow for these areas to remain undisturbed thereby keeping the dirty water management areas as small as possible. This is in line with the DWS Best Practice Guideline G1: Storm Water Management.
				In compliance with the National Environmental Management Waste Act, 2008 (Act No. 59 of 2008) and the National Norms and Standards for the Remediation of Contaminated Land and Soil Quality (GNR.331 of 2014), thereunder.
Hydrocarbon, chemical and waste materials spillages	Hydrocarbon and chemical spills may pollute soils within the area either through direct contact or indirectly through the contamination of surface water runoff. Similarly unsorted and improper storage of general waste, building rubble or equipment contaminated with radioactive material may contaminate soil either through direct contact or indirectly through the contamination of surface water runoff.	Storm water control measures will be upgraded or implemented and remediation measures will be implemented to contain any spills	Prior to the commencement of Operational Phase and activities with remediation activities being conducted as and when required.	<p>The prevention of the release of contaminated surface water is in line with the objectives of the DWS Best Practices Guideline H2: Pollution Prevention and Minimization of Impacts</p> <p>The demarcation will allow for these areas to remain undisturbed thereby keeping the dirty water management areas as small as possible. This is in line with the DWS Best Practice Guideline G1: Storm Water Management.</p>



Activity	Potential Impact	Mitigation type	Time period for implementation	Compliance with standards
				<p>In compliance with the Nation Environmental Management Waste Act, 2008 (Act No. 59 of 2008) and the National Norms and Standards for the Remediation of Contaminated Land and Soil Quality (GNR.331 of 2014), thereunder.</p> <p>In compliance with the Mine Health and Safety Act, 1996 (Act No. 29 of 1996).</p> <p>In compliance with the DWS Best Practice Guideline H2 Pollution Prevention and minimisation.</p>
<p>Decommissioning of the shafts and related infrastructure and rehabilitation of the disturbed footprint areas.</p>	<p>The decommissioning of the shafts and removal of infrastructure will result in the exposure of soil to the elements, resulting in erosion of the soil. This will not only impact on the fertility of the soil but may have an impact on the surface water quality, fauna and flora and sensitive landscapes.</p>	<p>Control measures will be implemented to prevent / stop soil erosion.</p>	<p>Decommissioning Phase through the Rehabilitation Phase until Closure has been obtained</p>	<p>In line with Regulation 70 of the Mineral and Petroleum Resources Development Regulation, GNR587 (2004).</p> <p>The continued implementation of the declared weed and alien invader management plan is in compliance with the NEM:BA (2004) and the regulations thereunder.</p>
<p>Decommissioning and rehabilitation of all shaft areas and closure of the mine.</p>	<p>It is important to note that the CAPM Orkney Gold Mine is an existing gold mine and has previously been operational. Therefore it is not anticipated that the re-commencement of the mining activities will have a further impact on the land use and land capability. However, during decommissioning and closure, all unnecessary infrastructure will be demolished and the surface area rehabilitated to the agreed upon end land use. Therefore a positive impact may be experienced as the land use may change from mining to agriculture or wilderness.</p>	<p>Remediation measures will be implemented to return the land to an agreed upon end land use.</p>	<p>Decommissioning Phase through the Rehabilitation Phase until Closure has been obtained</p>	<p>By rehabilitation as much of the disturbed area as possible, the dirty water management area is reduced. This is in line with the DWS Best Practice Guidelines for the isolation of clean and dirty water management areas, and reducing the size of the dirty water management areas.</p>
<p>Operational activities and care and maintenance activities to be conducted at the No.6 and No.7 Shafts and the No.1 to No.5 Shafts, respectively.</p>	<p><i>Boophone disticha</i> is a plant species with a conservation status of "Declining". The habitat of this plant species is dry grasslands and rocky areas and is widespread in South Africa and extends up the eastern half of southern Africa to Uganda. This plant species was identified within the untransformed grassland areas adjacent to the No.7 Shaft. It was also identified that <i>Pearsonia bracteata</i> and <i>Drimia sanguinea</i> could also occur in this area owing to the presence of the suitable habitat. No mining activities will be conducted outside of the underground Mining Right area or the Surface Rights area of the shaft, therefore it is not anticipated that the proposed mining activity at the No.7 Shaft will impact</p>	<p>Control measures will be implemented to prevent the disturbance and destruction of the natural vegetation and species of conservation concern.</p>	<p>Commissioning Phase, prior to the commencement of Operational activities.</p>	<p>In compliance with section 5 of the Mine Health and Safety Act (1996).</p>



Activity	Potential Impact	Mitigation type	Time period for implementation	Compliance with standards
	<p>on these species. However in the even that any activities are conducted outside of the shaft boundary area, these species may be impacted upon. Dust, generated from the loading and hauling of the ore, may also settle on the vegetation in this area and may impact on the growth and photosynthesis and transpiration processes of the vegetation.</p> <p>Only three species protected under Schedule 11 of the Transvaal Nature Conservation Act (No.12 of 1983), namely <i>Babiana hypogea</i>, <i>Gladiolus permeabilis</i> and <i>Crinum graminicola</i> were recorded from untransformed grassland (corresponding to shaft footprints #4 and #5) on the study area.</p>			<p>Air quality and dust fallout monitoring will determine if the minimum thresholds as stipulated in the NEM:AQA (2004) and regulation thereunder are not exceeded. Should they be exceeded the appropriate actions will be undertaken an Atmospheric Emissions Licence will be applied for. This is in compliance with the MPRDA (2002), the NEM:AQA (2004) and the Mine Health and Safety Act (1996).</p> <p>In Compliance with the Mining Right.</p>
	<p>The decommissioning of the shafts and removal of infrastructure will result in the exposure of soil to the elements, resulting in erosion of the soil. This will not only impact on the fertility of the soil but may have an impact on the surface water quality, fauna and flora and sensitive landscapes.</p>	<p>Control measures will be implemented to prevent / stop soil erosion.</p>	<p>Decommissioning Phase through the Rehabilitation Phase until Closure has been obtained</p>	<p>Keeping the dirty water management areas as small as possible is in line with the DWS Best Practice Guideline G1: Storm Water Management.</p>
	<p>A number of weeds and invader plant species were identified within the study area. These weeds and invader plant species established on disturbed areas have a tendency to dominate or replace the canopy herbaceous layer of natural ecosystems, thereby transforming the structure, composition and function of natural ecosystems.</p>	<p>Control measure will be implemented to prevent the establishment and spread of weeds and invader species.</p>	<p>Commencement prior to the Operational Phase, throughout the Life of until Closure is obtained.</p>	<p>The implementation of these mitigation measures are in compliance with the NEM:BA (2004) and the regulations thereunder.</p>
<p>Operational activities and care and maintenance activities to be conducted at the No.6 and No.7 Shafts and the No.1 to No.5 Shafts, respectively.</p>	<p>The study area provides potential habitat for 10 mammal taxa of conservation concern, of which, the following species may occur:</p> <ul style="list-style-type: none"> • Brown Hyaena. • Honey Badger. • South African Hedgehog. • Shrews. • Black-footed cat. <p>Due to the increased human presence in the area and observation within the study area, both the Brown Hyaena and the Black-footed Cat are said to be irregular in occurrence within the study area. The Honey badger as well as the south African hedgehog are however expected to occur within the study area due to their tolerance to modified habitat types.</p>	<p>Control measure will be implemented to prevent the destruction of the natural habitats.</p>	<p>Prior to the commencement of Operational Activities, for the Life of Mine.</p>	<p>The development and implementation of an Environmental Awareness Plan and the training of employees regarding the importance of the environment and potential impacts to the environment is in compliance with Regulation 51 of the MPRDA (2002).</p> <p>This is in compliance with the NEM:BA (2004) and the regulations thereunder.</p>



Activity		Potential Impact	Mitigation type	Time period for implementation	Compliance with standards
		<p>The bird species of conservation concern are likely to occur within the study area and include:</p> <ul style="list-style-type: none"> • The Melardious Lark (<i>Mirafra cheniana</i>). • The near threatened Abdim's stork (<i>Ciconia abdimii</i>). • The vulnerable Lanner Falcon (<i>Falco biarmicus</i>). <p>The Abdims Stork and the Lanner Falcon were not recorded during the site survey but are classified as likely to occur within the study area. The Melardious Lark was however recorded within the study area during the site survey. 23 other species are sympatric to the study area however they are either irregular visitors to the area or unlikely to be present due to the absence of suitable habitats.</p>			<p>This is in compliance with section 5 of the Mine Health and Safety Act (1996).</p>
		<p>Animals within the study area and adjacent to the mine may be hunted and poached, by employees, for food.</p>			<p>In compliance with the Mine Health and Safety Act, 1996 (Act No. 29 of 1996) and the DMR guidelines for noise control.</p>
		<p>Animal injury and / or death may result from animal life accessing the mine shaft areas as well as by collisions with vehicles and machinery on and off site.</p>	<p>Control measure will be implemented to prevent unauthorised access to the site and to prevent animals from entering the site.</p>		<p>This is in compliance with the NEM:BA (2004) and the regulations thereunder.</p>
		<p>Noise generated from mining activities may scare animal life in the vicinity and lead to migration away from the area and possibly even injury and death.</p>	<p>Control measure will be implemented to prevent the generation of noise and remediation measure will be implemented in the event that undesired noise is generated.</p>	<p>Operational Phase, for the Life of Mine</p>	<p>In compliance with the Mine Health and Safety Act, 1996 (Act No. 29 of 1996) and the DMR guidelines for noise control.</p>
No.1 Shaft	<p>Operation of winder cooling ponds.</p>	<p>The winder cooling ponds are concrete ponds situated next to one of the winder houses and in close proximity of the clean runoff channels. These ponds contain process water used for cooling purposes.</p> <p>Surface water quality: Overflow of winder cooling ponds may lead to affected water discharge into the clean surface runoff channels situated next to the cooling ponds and may result in deterioration in quality of surface water runoff from the Shaft #1 area.</p>	<p>Storm water management measure will be implemented / upgraded to prevent the discharge of contaminated surface water.</p>	<p>Commissioning Phase.</p>	<p>This is line with the DWS Best Practice Guidelines, to prevent and minimise impacts and to ensure the separation of clean and dirty water management areas.</p>
	<p>Storage and handling of hydrocarbon containers.</p>	<p>Surface water contamination may take place as a result of leaking hydrocarbon containers stored outside of designated areas.</p>	<p>Control and remediation measures will be implemented to prevent the contamination of surface water runoff.</p>	<p>Life of Mine</p>	
	<p>Containment of affected water.</p>	<p>Overflow from the containment sump underneath the conveyor system may lead to deterioration of clean surface water quality in the immediate vicinity of the Shaft #1 area.</p>	<p>Storm water management measure will be implemented / upgraded to prevent the discharge of contaminated water.</p>	<p>Commissioning Phase</p>	
No.2 Shaft	<p>Uncontrolled surface water runoff.</p>	<p>There are no current diversion measures to prevent surface runoff from flowing into Shaft #2. Runoff retention also takes place inside previously constructed containment facilities.</p>	<p>Storm water management measure will be implemented.</p>	<p>Commissioning Phase</p>	



Activity		Potential Impact	Mitigation type	Time period for implementation	Compliance with standards
No.3 Shaft	Rehabilitation of the No.3 Shaft area.	Closure phase: Incorrect rehabilitation techniques may result in exposed areas and areas that will prevent drainage of storm water runoff towards the downstream environment.	Control measures and rehabilitation monitoring programmes will be implemented to ensure that rehabilitation is conducted in the appropriate manner.	Commissioning Phase	
No.4 Shaft	Uncontrolled surface water runoff	There are no current diversion measures to prevent surface runoff from flowing into Shaft #4. Runoff retention also takes place inside previously constructed containment facilities within the shaft operations area.	Storm water management measure will be implemented.	Commissioning Phase	
No.5 Shaft	Sewage management	A sewage sump is located next to a clean storm water diversion channel downstream of the Shaft #5 hostel area. Mine personnel has indicated that there were previous incidents in which the sump's capacity was reached and sewage entered the clean storm water conveyance channel.	Storm water management measures will be implemented to contain spillages from the sump and divert clean surface water runoff away from the area.	Commissioning Phase	
No.6 Shaft	Uncontrolled storm water runoff	There are no current diversion measures to prevent surface runoff from flowing into Shaft #6.	Storm water management measures will be implemented.	Commissioning Phase	
	Wash bay operation	The wash bay will be used as a designated area to clean equipment and currently not fitted with an oil separator. This facility is not connected to a dirty water system and therefore wash water is pumped out and discharged into the adjacent veldt during operations. Surface water quality: Should any wash water be discharged from the wash bay in its current status, discharge of hydrocarbon contaminated water will take place in the surrounding clean water environment.	Storm water management measures and control measures will be implemented to prevent the discharge of contaminated surface water runoff.	Commissioning Phase	
No.7 Shaft	Chemical and hydrocarbon management	The main storm water channel is located next to a hydrocarbon and chemical storage area. Any chemical and hydrocarbon containers as well as equipment (operated using grease) stored outside of a designated area creates a risk of surface water pollution. Contaminated runoff as a result of poor housekeeping practises will enter the clean storm water diversion trench towards the adjacent veldt area. Surface water quality: The quality of surface runoff generated within the Shaft #7 area may be deteriorated as a result of contact with hydrocarbons such as oil and grease.	Control and storm water management measures will be implemented to prevent the contamination of clean surface water runoff	Commissioning Phase	
	Wash bay operation	The wash bay will be used as a designated area to clean radio-active contaminated equipment. This facility is connected to a dirty water system and wash water is pumped to the adjacent plant and used as part of the process water system. Should an incident occur, radio-active wash water may be discharged towards the clean storm water channel. Surface water quality: Discharge of contaminated water from the wash bay at Shaft #7 may lead to a significant deterioration of surface water quality towards the downstream clean water environment.	Control and storm water management measures will be implemented	Commissioning Phase	



Activity	Potential Impact	Mitigation type	Time period for implementation	Compliance with standards
Sump operation underneath conveyor	<p>A sump has been constructed underneath the conveyor system next to Shaft #7. The purpose of this sump is to contain any seepage from the damp ore material hoisted from underground. This sump is fitted with pumping infrastructure towards the adjacent plant as part of the process water system. There is a risk that overflow into the main storm water channel might occur as a result of pump failure.</p> <p>Surface water quality: Discharge of contaminated water from the sump may result in deterioration of clean surface water runoff towards the adjacent clean water environment.</p>	Storm water management measures will be implemented / upgraded to prevent the discharge of contaminated water.	Commissioning Phase	
Dewatering of the shafts for the safe continuation of mining.	During the operational phase groundwater will be dewatered to the bottom of the Vaal Contact Reef which will result in dewatering of the surrounding aquifer. However, the transient modelling exercise showed that the cone of depression is limited in extent with no boreholes included within its influence zone.	Control measure will be implemented.	Operational Phase	<p>This is in compliance with GN.704 under the NWA (1998) as well as the DWS Best practice Guideline G1: Storm Water Management.</p> <p>In line with the DWS Best Practice Guideline A6: Water Management for Underground Mines.</p>
The underground deep level mining of gold bearing ore, including the associated activities conducted on the surface.	The impacts on groundwater quality are primarily related to the management of materials, wastes and spills from drilling operations and unauthorised disposal of contaminated substances. Contamination of groundwater may also arise due to incorrect handling and disposal of waste materials, the physical drilling process (sludge contains oils and greases) and oil leaks from drill rigs. This risk is considered low. Groundwater quality impacts may also arise from seepage from the recycle dam underground, although this is considered a low impact since the dam will be lined. The general risk towards groundwater quality deterioration is considered low.	Control measures will be implemented to prevent the contamination of groundwater resources.	Operational Phase	<p>This is in compliance with GN.704 under the NWA (1998) as well as the DWS Best practice Guideline G1: Storm Water Management.</p> <p>In compliance with the DWS Best Practise Guidelines with specific reference to BPG H2 Pollution Prevention and Minimisation of Impacts.</p>
Decommissioning and closure of the underground workings, shafts and associated infrastructure and well as the shaft surface area.	During the closure phases when all pumping within the region has ceased, the water in the shaft/s may rise towards the Environmentally Critical Level (ECL) where, if contaminated and affected by AMD reactions, may pollute aquifers or surface drainages. The rate at which, and up to which point the water will rise is highly complex and unknown given the multitude of parameters and dewatering schemes within the KOSH area. However previous studies in the KOSH area indicate a likely probability of decant and rise to pre-mining conditions and the ECL. However, at the CAPM 7 Shaft the groundwater table is not expected to return to pre - mining conditions. The reason being that decant will occur at 40 Level, creating a permanent dewatering cone towards 4 Shaft. The quality of the decant water is expected to be contaminated but will improve over time as existing areas of exposed sulphide mineralisation are flooded or oxidised.	Control measure will be implemented.	Closure Phase	<p>This is in compliance with GN.704 under the NWA (1998) as well as the DWS Best practice Guideline G1: Storm Water Management.</p> <p>In compliance with the DWS Best Practise Guidelines with specific reference to BPG H2 Pollution Prevention and Minimisation of Impacts.</p>



Activity	Potential Impact	Mitigation type	Time period for implementation	Compliance with standards
Mining and mining related activities conducted within the shaft areas.	An assessment was conducted against the NFEPA classified wetlands and the proximity of these wetlands to the CAPM Orkney Gold Mine shaft areas. As described in Chapter H of Part 7.4.1 (Part A – Environmental Impact Assessment) of the EIA and EMP, three (3) NFEPA classified wetland areas have been identified to be in close proximity to the No.2 Shaft (unchannelled valley bottom wetland), the No.3 Shaft (channelled Valley Bottom Wetland) and the No.4 Shaft (flat wetland area). The operational activities to be conducted within the vicinity of shaft areas may impact on these wetland areas in terms of surface water quality, fauna, flora and soil aspects (refer also to Part 4.2, Part 4.5, Part 4.6 and Part 4.7). It is however important to note that these shafts are not currently operational as the No.7 and No.6 Shaft will be the first shafts to commence with operations and operations at the No.3 Shaft will not commence as the No.3 Shaft area is in the process of being rehabilitated.	Control and storm water management measures will be implemented.	Commissioning of the various shaft areas.	<p>This is in line with the DWS Best Practice Guidelines G1 and H2, for storm water management, to prevent and minimise impacts and to ensure the separation of clean and dirty water management areas.</p> <p>This is in compliance with the National Water Act, 1998 (Act No. 36 of 1998) and GN 704 (1999) thereunder.</p>
The operation and utilization of the fans to remove stale air from the underground working.	The operation and utilisation of the Kanana Vent Duct, No 6 Shaft Veld Fan and the No 7 Shaft Main Fan may result in the release of potentially harmful pollutants and emissions into the air, from the underground workings. This may potentially affect the health of the residents in the area.	A monitoring programme will be implemented.	Operational Phase	Air quality and dust fallout monitoring will determine if the minimum thresholds as stipulated in the NEM:AQA (2004) and regulation thereunder are not exceeded. Should they be exceeded the appropriate actions will be undertaken an Atmospheric Emissions Licence will be applied for. This is in compliance with the MPRDA (2002), the NEM:AQA (2004) and the Mine Health and Safety Act (1996).
Hauling of mined ore to the Nicolor South Plant.	As described above, the ore mined at the CAPM Orkney Gold Mine will be transported, via haulage trucks, to the Nicolor South Plant for processing utilising the formal road network. The transportation of the ore may therefore result in the generation of dust that may have an impact on the local air quality.	A monitoring programme and control measures will be implemented.	Operational Phase	<p>In compliance with the National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004) and the National Dust Control regulations thereunder.</p> <p>Air quality and dust fallout monitoring will determine if the minimum thresholds as stipulated in the NEM:AQA (2004) and regulation thereunder are not exceeded. Should they be exceeded the appropriate actions will be undertaken an Atmospheric Emissions Licence will be applied for. This is in compliance with the MPRDA (2002), the NEM:AQA (2004) and the Mine Health and Safety Act (1996).</p>



Activity	Potential Impact	Mitigation type	Time period for implementation	Compliance with standards
				<p>In line with Regulation 70 of the Mineral and Petroleum Resources Development Regulation, GNR587 (2004).</p> <p>In compliance with the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).</p>
	<p>As described above, the ore mined at the CAPM Orkney Gold Mine will be transported, via haulage trucks, to the Nicolor South Plant for processing utilising the formal road network. Emissions from the haulage trucks may have a minor impact on the localised air quality.</p>	<p>Control measure will be implemented.</p>	<p>Operational Phase for the Life of Mine</p>	<p>Air quality and dust fallout monitoring will determine if the minimum thresholds as stipulated in the NEM:AQA (2004) and regulation thereunder are not exceeded. Should they be exceeded the appropriate actions will be undertaken an Atmospheric Emissions Licence will be applied for. This is in compliance with the MPRDA (2002), the NEM:AQA (2004) and the Mine Health and Safety Act (1996).</p>
<p>The reinstatement of operations at the CAPM Orkney Gold Mine No.7 Shaft and No.6.</p>	<p>Currently the shafts are not producing and the noise levels are from normal background noise and activities originating from human interaction and vehicle. In the not too distant future these shafts will be re-opened and the prepared for production. This will include activities such as pumping of water and replacing structures that are worn and damaged. Through this process there will be a great deal of workshop and Commissioning activities and vehicle movement while the shafts and underground workings are prepared. Once operational again the main noise sources will be from the main surface fans and the normal shaft noises.</p>	<p>Control measure will be implemented.</p>	<p>Operational Phase</p>	<p>In compliance with the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004).</p>
<p>The care and maintenance of the No.1 to No.5 shafts until such a time that they are prepared from operations or decommissioned and rehabilitated.</p>	<p>These shaft will not be re-opened again for production. Normal care and maintenance will be carried on these shafts. Should there be any additional activities carried out, such as the breaking down of shaft structures and buildings, the noise levels should be monitored and the necessary control measures be introduced to minimise the impact on the community. Should operations commence at these shafts, the impacts as described above will apply.</p>	<p>Control measures will be implemented.</p>	<p>Care and Maintenance Phase</p>	<p>In compliance with the Mine Health and Safety Act, 1996 (Act No. 29 of 1996) and the DMR guidelines for noise control.</p>
<p>The reinstatement of operations at the CAPM Orkney Gold Mine Shaft areas.</p>	<p>Although the CAPM Orkney Gold Mine is an existing mine and the community and regular visitors of the area are likely to be desensitised to the mining related infrastructure, the mine has been under care and maintenance since the year 2010. Therefore, once operations at the shafts commence, the increased traffic and presence of employees as well as the increased generation of dust and emissions clouds from the machinery and vehicles may cause a visual</p>	<p>Control measures will be implemented.</p>	<p>Commissioning Phase</p>	<p>-</p>



Activity		Potential Impact	Mitigation type	Time period for implementation	Compliance with standards
		disturbance. There are several sensitive receptors in both the foreground and middle ground that include residential areas and the town of Orkney.			
No.3 Shaft	The decommissioning and removal of infrastructure and the rehabilitation of the surface area of the No.3 Shaft.	This site with traditional riveted steel headgear is dated to the end of the 1930's. CAPM Orkney Gold Mine removed all infrastructure (including the headgear) at the No.3 Shaft, without being in possession of a demolition permit. This site was demolished between the period of 2011 and 2015. The site is protected by section 34 (1) of Act 25 of 1999, and is rated as "General protection" A (Field Rating IV A) by the SAHRA minimum standards May 2007, therefore cannot be altered or destructed without a demolition permit issued by the relevant heritage authorities.	Mitigation measures will be implemented and the correct procedure will be requested and followed.	As soon as possible	In compliance with the National Heritage Resources Act, 1999 (Act No. 25 of 1999).
No.7 Shaft	The decommissioning and removal of infrastructure workshops at the No.7 Shaft.	This site with traditional riveted steel headgear is dated to the mid 1930's. It is possibly the most representative of the early period of mining in the region. Even so it reflects alterations and updating over time. Most of the site is still intact. The mining objectives of CAPM Gold states that the site will mainly be retained as-is. It will be maintained in its present format allowing for and according to modern mining safety regulations. It is the wish of CAPM Gold to demolish five historic buildings on the eastern perimeter of the site as these are superfluous to the proposed mining perspectives. It includes four steel framed and corrugated iron clad workshops and one brick walled, workshop with wooden trusses and corrugated iron roof. All five buildings are protected by section 34(1) of the National Heritage Act, Act 25 of 1999. These are all rated as "General protection" A (Field Rating IV A) by the SAHRA minimum standards May 2007, therefore cannot be altered or demolished without a demolition permit issued by the relevant heritage authorities.	Mitigation measures will be implemented by following the correct procedure and obtaining appropriate authorisations.	Prior to demolition of any heritage resources	
The commencement of operations at the No.6 and the No.7 Shafts.		As described in the SLP (attached to the EIA and EMP as Annexure G), upon commencement of operations at the No.7 and the No.6 Shaft the CAPM Orkney Gold Mine will employ 471 individuals of which the majority (a minimum of 95%) will be sourced from the local communities. This is a positive impact in terms of socio-economic aspects as not only will 4771 individuals be employed but the community will also benefit indirectly through the increased spending on goods and services, the use of local sub-contractors, as well as leading to a decrease in unemployment of the area.	Enhancement measures will be implemented.	Operational Phase	In compliance with the mines SLP and the DMR guideline for a SLP.
Mine closure.		At the end of the Operational Phase of the Orkney Gold Mine, mining operations will cease and the mine will prepare for decommissioning and closure. Rehabilitation activities will commence, depending on the agreed upon end land, and infrastructure will be removed. During this phase a loss of jobs will occur as the amount of employees required during the Operational Phase will no longer be required.	Control measures will be implemented.	Operational Phase	
The commencement of operations at the No.6 and the No.7 Shafts and eventually the No.4 Shaft and No.1 Shaft.		The commencement of operations at the CAPM Orkney Gold Mine may lead to an influx of job seekers to the area. As stipulated in the SLP of the mine, the mine will employ 471 individuals, of which the majority, (a minimum of 95%) will	Control measures will be implemented.	Commissioning Phase	



Activity		Potential Impact	Mitigation type	Time period for implementation	Compliance with standards
		be sourced from the local community. The influx of job seekers to the area may result in several social impacts due to the limited job supply and includes: <ul style="list-style-type: none"> • An increase in theft / crime. • An increase in informal settlements. • Potential spread of HIV / AIDS. 			
Hazards to community	The commencement of operations at the No.6 and the No.7 Shafts and eventually the No.4 Shaft and No.1 Shaft.	Due to the close proximity of the shaft areas to residential areas (Orkney, Kanana, Stilfontein, and Vaal Reefs), the storage of hazardous materials and chemicals, gas cylinders and welding and cutting equipment poses a hazard to the safety of the community.	Control measures will be implemented to prevent the exposures of the community to unnecessary hazards.	Commissioning Phase	In line with the DWS Best Practice Guideline H2 for Pollution Prevention and Minimisation of Impacts.
		The shaft areas pose a hazard to the community and fauna in the area as all operational shafts will be open until such a time that decommissioning commences and the shafts are sealed.	Control measures will be implemented to prevent the exposures of the community to unnecessary hazards.	Operational Phase	
		All ore mined at the CAPM Orkney Gold, as described above, will be transported approximately 18 km to the Nicolor South Plant for processing and treatment. There CAPM Orkney Gold Mine proposes to utilise haulage trucks for transportation purposes. This poses a hazard to the community and local residents as the number of mine vehicles will increase on the roads which are used by the local community and residents.	Control measures will be implemented to prevent the exposures of the community to unnecessary hazards.	Operational Phase	In compliance with the Mine Health and Safety Regulations under the Mine Health and Safety Act (1996).
					This is in compliance with section 5 of the Mine Health and Safety Act (1996).
					In compliance with the National Road Traffic Act, 1996 (Act No. 93 of 1996) and the regulations thereunder.
In line with the Asbestos Regulations R155 (2002) under the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993).					
The generation of waste on the mine, including asbestos and potential radiation contaminated equipment may result in health hazard to the local community.	Control measures will be implemented to prevent the exposures of the community to unnecessary hazards.	Commissioning Phase, for the Life of Mine	In compliance with the Hazardous Substances Act, 1973 (Act No. 15 of 1973), the Nuclear Energy Act, 1999 (Act No. 46 of 1999) and the Nuclear Licence.		



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

Table 16: Summary of the negative and positive environmental impacts, after mitigation.

Geology	
Blasting, drilling and extraction of rock will lead to the permanent destruction of the localised geological strata.	High
Soil	
The soil within the natural vegetation and secondary grasslands area may be negatively impacted upon should any mining related activities be conducted on these areas.	Low
Hydrocarbon and chemical as well as general waste, building rubble and radioactive contaminated equipment spills may pollute soils within the area either through direct contact or indirectly through the contamination of surface water runoff.	Medium
The decommissioning of the shafts and removal of infrastructure will result in the exposure of soil to the elements, resulting in erosion of the soil. This will not only impact on the fertility of the soil but may have an impact on the surface water quality, fauna and flora and sensitive landscapes.	Low
Land use and land capability	
Therefore, a positive impact may be experienced as the land use may change from mining to agriculture or wilderness, depending on the results of consultation with the DMR and municipalities.	Positive
Flora ²⁸	
<p><i>Boophone disticha</i> is a plant species with a conservation status of “Declining” and was identified within the untransformed grassland areas adjacent to the No.7 Shaft. It was also identified that <i>Pearsonia bracteata</i> and <i>Drimia sanguinea</i> could also occur in this area owing to the presence of the suitable habitat. No mining activities will be conducted outside of the underground Mining Right area or the Surface Rights area of the shaft, therefore it is not anticipated that the proposed mining activity at the No.7 Shaft will impact on these species. However, in the event that any activities are conducted outside of the shaft boundary area, these species may be impacted upon. Dust, generated from the loading and hauling of the ore, may also settle on the vegetation in this area and may impact on the growth and photosynthesis and transpiration processes of the vegetation.</p> <p>Only three species protected under Schedule 11 of the Transvaal Nature Conservation Act (No.12 of 1983), namely <i>Babiana hypogea</i>, <i>Gladiolus permeabilis</i> and <i>Crinum graminicola</i> were recorded from untransformed grassland (corresponding to shaft footprints #4 and #5) on the study area.</p>	Low

²⁸ Note: The impacts, significance and respective mitigation measure were obtained from the baseline botanical and faunal biodiversity survey. Refer also to Annexure C3 of the EIA / EMP document.



<p>The decommissioning of the shafts and removal of infrastructure will result in the exposure of soil to the elements, resulting in erosion of the soil. This will not only impact on the fertility of the soil but may have an impact on the surface water quality, fauna and flora and sensitive landscapes.</p>	<p>Low</p>
<p>A number of weeds and invader plant species were identified within the study area. These weeds and invader plant species established on disturbed areas have a tendency to dominate or replace the canopy herbaceous layer of natural ecosystems, thereby transforming the structure, composition and function of natural ecosystems.</p>	<p>Low</p>
<p>Fauna²⁹</p>	
<p>The study area provides potential habitat for 10 mammal taxa of conservation concern, of which, the following species may occur:</p> <ul style="list-style-type: none"> • Brown Hyaena. • Honey Badger. • South African Hedgehog. • Shrews. • Black-footed cat. <p>Due to the increased human presence in the area and observation within the study area, both the Brown Hyaena and the Black-footed Cat are said to be irregular in occurrence within the study area. The Honey badger as well as the south African hedgehog are however expected to occur within the study area due to their tolerance to modified habitat types.</p> <p>The bird species of conservation concern are likely to occur within the study area and include:</p> <ul style="list-style-type: none"> • The Melardious Lark (<i>Mirafrja cheniana</i>). • The near threatened Abdim's stork (<i>Ciconia abdimii</i>). • The vulnerable Lanner Falcon (<i>Falco biarmicus</i>). <p>The Abdims Stork and the Lanner Falcon were not recorded during the site survey but are classified as likely to occur within the study area. The Melardious Lark was however recorded within the study area during the site survey. 23 other species are sympatric to the study area however they are either irregular visitors to the area or unlikely to be present due to the absence of suitable habitats.</p>	<p>Low</p>
<p>Animals within the study area and adjacent to the mine may be hunted and poached, by employees, for food.</p>	
<p>Animal injury and / or death may result from animal life accessing the mine shaft areas as well as by collisions with vehicles and machinery on and off site.</p>	<p>Low</p>
<p>Noise generated from mining activities may scare animal life in the vicinity and lead to migration away from the area and possibly even injury and death.</p>	<p>Low</p>
<p>Surface water³⁰</p>	

29 Note: The impacts, significance and respective mitigation measure were obtained from the baseline botanical and faunal biodiversity survey. Refer also to Annexure C3 of the EIA / EMP document.

30 Note: The impacts, significance and respective mitigation measure were obtained from the conceptual Storm Water Management Plan Specialist Report. Refer also to Annexure C2 of the EIA / EMP document



Surface water quality: Overflow of winder cooling ponds may lead to affected water discharge into the clean surface runoff channels situated next to the cooling ponds and may result in deterioration in quality of surface water runoff from the Shaft #1 area.	Low
Surface water contamination may take place as a result of leaking hydrocarbon containers stored outside of designated areas.	Low
Overflow from the containment sump underneath the conveyor system may lead to deterioration of clean surface water quality in the immediate vicinity of the Shaft #1 area.	Low
There are no current diversion measures to prevent surface runoff from flowing into Shaft #2. Runoff retention also takes place inside previously constructed containment facilities.	Low
Closure phase: Incorrect rehabilitation techniques may result in exposed areas and areas that will prevent drainage of storm water runoff towards the downstream environment.	Low
There are no current diversion measures to prevent surface runoff from flowing into Shaft #4. Runoff retention also takes place inside previously constructed containment facilities within the shaft operations area.	Low
A sewage sump is located next to a clean storm water diversion channel downstream of the Shaft #5 hostel area. Mine personnel has indicated that there were previous incidents in which the sump's capacity was reached and sewage entered the clean storm water conveyance channel.	Low
There are no current diversion measures to prevent surface runoff from flowing into Shaft #6.	Low
Surface water quality: Should any wash water be discharged from the wash bay in its current status, discharge of hydrocarbon contaminated water will take place in the surrounding clean water environment.	Low
The quality of surface runoff generated within the Shaft #7 area may be deteriorated as a result of contact with hydrocarbons such as oil and grease.	Low
Discharge of contaminated water from the wash bay at Shaft #7 may lead to a significant deterioration of surface water quality towards the downstream clean water environment.	Low
Discharge of contaminated water from the sump may result in deterioration of clean surface water runoff towards the adjacent clean water environment.	Low
Groundwater	
During the operational phase groundwater will be dewatered to the bottom of the Vaal Contact Reef which will result in dewatering of the surrounding aquifer. However, the transient modelling exercise showed that the cone of depression is limited in extent with no boreholes included within its influence zone.	Medium
The impacts on groundwater quality are primarily related to the management of materials, wastes and spills from drilling operations and unauthorised disposal of contaminated substances. Contamination of groundwater may also arise due to incorrect handling and disposal of waste materials, the physical drilling process (sludge contains oils and greases) and oil leaks from drill rigs. This risk is considered low. Groundwater quality impacts may also arise from seepage from the recycle dam underground, although this is considered a low impact since the dam will be lined. The general risk towards groundwater quality deterioration is considered low.	Medium
During the closure phases when all pumping within the region has ceased, the water in the shaft/s may rise towards the Environmentally Critical Level (ECL) where, if contaminated and affected by AMD reactions, may pollute aquifers or surface drainages. The rate at which, and up to which point	Medium



the water will rise is highly complex and unknown given the multitude of parameters and dewatering schemes within the KOSH area. However previous studies in the KOSH area indicate a likely probability of decant and rise to pre-mining conditions and the ECL. However, at the CAPM 7 Shaft the groundwater table is not expected to return to pre - mining conditions. The reason being that decant will occur at 40 Level, creating a permanent dewatering cone towards 4 Shaft. The quality of the decant water is expected to be contaminated but will improve over time as existing areas of exposed sulphide mineralisation are flooded or oxidised.	
Sensitive landscapes	
, three (3) NFEPA classified wetland areas have been identified to be in close proximity to the No.2 Shaft (unchannelled valley bottom wetland), the No.3 Shaft (channelled Valley Bottom Wetland) and the No.4 Shaft (flat wetland area). The operational activities to be conducted within the vicinity of shaft areas may impact on these wetland areas in terms of surface water quality, fauna, flora and soil aspects.	Low
Air quality	
The operation and utilisation of the Kanana Vent Duct, No 6 Shaft Veld Fan and the No 7 Shaft Main Fan may result in the release of potentially harmful pollutants and emissions into the air, from the underground workings. This may potentially affect the health of the residents in the area.	Medium
As described above, the ore mined at the CAPM Orkney Gold Mine will be transported, via haulage trucks, to the Nicolor South Plant for processing utilising the formal road network. The transportation of the ore may therefore result in the generation of dust that may have an impact on the local air quality.	Low
As described above, the ore mined at the CAPM Orkney Gold Mine will be transported, via haulage trucks, to the Nicolor South Plant for processing utilising the formal road network. Emissions from the haulage trucks may have a minor impact on the localised air quality.	Low
Noise³¹	
Once operational again the main noise sources will be from the main surface fans and the normal shaft noises.	Low
Should there be any additional activities carried out at the No.1-5 Shafts, such as the breaking down of shaft structures and buildings, the noise levels should be monitored and the necessary control measures be introduced to minimise the impact on the community. Should operations commence at these shafts, the impacts as described above will apply.	Low
Visual aspects	
Although the CAPM Orkney Gold Mine is an existing mine and the community and regular visitors of the area are likely to be desensitised to the mining related infrastructure, the mine has been under care and maintenance since the year 2010. Therefore, once operations at the shafts commence, the increased traffic and presence of employees as well as the increased generation of dust and emissions clouds from the machinery and vehicles may cause a visual disturbance. There are several sensitive receptors in both the foreground and middle ground that include residential areas and the town of Orkney.	Low

³¹ Note: The impacts, significance and respective mitigation measure were obtained from the environmental noise impact assessment report. Refer also to Annexure C5 of the EIA / EMPr document.



Site of archaeological and cultural importance³²	
This site with traditional riveted steel headgear is dated to the end of the 1930's. CAPM Orkney Gold Mine removed all infrastructure (including the headgear) at the No.3 Shaft, without being in possession of a demolition permit. This site was demolished between the period of 2011 and 2015. The site is protected by section 34 (1) of Act 25 of 1999, and is rated as "General protection" A (Field Rating IV A) by the SAHRA minimum standards May 2007, therefore cannot be altered or destructed without a demolition permit issued by the relevant heritage authorities.	Unknown at present
This site with traditional riveted steel headgear is dated to the mid 1930's. It is possibly the most representative of the early period of mining in the region. Even so it reflects alterations and updating over time. Most of the site is still intact. The mining objectives of CAPM Gold states that the site will mainly be retained as-is. It will be maintained in its present format allowing for and according to modern mining safety regulations. It is the wish of CAPM Gold to demolish five historic buildings on the eastern perimeter of the site as these are superfluous to the proposed mining perspectives. It includes four steel framed and corrugated iron clad workshops and one brick walled, workshop with wooden trusses and corrugated iron roof. All five buildings are protected by section 34(1) of the National Heritage Act, Act 25 of 1999. These are all rated as "General protection" A (Field Rating IV A) by the SAHRA minimum standards May 2007, therefore cannot be altered or demolished without a demolition permit issued by the relevant heritage authorities.	No Risk if proper procedures are applied and demolition permits are obtained
Socio-economic aspects	
CAPM Orkney Gold Mine will employ 471 individuals, the majority of which (a minimum of 95%) will be sourced from the local communities.	Positive
During Decommissioning and Closure, a loss of jobs will occur as the amount of employees required during the Operational Phase will no longer be required.	High
The commencement of operations at the CAPM Orkney Gold Mine may lead to an influx of job seekers to the area.	Medium
Due to the close proximity of the shaft areas to residential areas (Orkney, Kanana, Stilfontein, Vaal Reefs), the storage of hazardous materials and chemicals, gas cylinders and welding and cutting equipment poses a hazard to the safety of the community.	Low
The shaft areas pose a hazard to the community and fauna in the area as all operational shafts will be open until such a time that decommissioning commences and the shafts are sealed.	Medium
CAPM Orkney Gold Mine proposes to utilise haulage trucks for transportation purposes. This poses a hazard to the community and local residents as the number of mine vehicles will increase on the roads which are used by the local community and residents.	Low
The generation of waste on the mine, including asbestos and potential radiation contaminated equipment may result in health hazard to the local community.	Low

32 Note: The impacts, significance and respective mitigation measure were obtained from the cultural heritage impact assessment report.

Refer also to Annexure C6 of the EIA / EMPr document



12. Cumulative impacts

Cumulative impacts refer to the situation where an activity may in itself not have a significant impact, but may become significant when added to the existing and potential impacts from similar or different activities in the area.

Cumulative impacts can be defined as “changes to the environment that are caused by an action in combination with other past, present and future human actions” (DEAT, 2004). Different types of cumulative impacts can occur, depending on the characteristics thereof. Table 17 below presents a summary of these cumulative impacts as per Guideline 5: Assessment of Alternatives and Impacts (DEAT, 2006).

Table 17: Types of cumulative impacts

Type		Description
Additive		Where it adds to the impact which is caused by other similar impacts.
Interactive impact		A cumulative impact is caused by different impacts that combine to form a new kind of impact.
	Countervailing	The net adverse cumulative impact is less than the sum of the individual impacts.
	Synergistic	The net adverse cumulative impact is greater than the sum of the individual impacts.

The cumulative impacts as presented in Table 18 below, have been identified.

Table 18: Cumulative impacts

Environmental Component	Cumulative impact description
Geology	The CAPM Orkney Gold Mine is an existing in close proximity to the town of Orkney. The mine is also surrounded by several other deep gold mine operations such as Anglo Gold Ashanti. Therefore, the geological strata within the area has already been impacted upon. The re-instatement and commencement of operation at the No.7 Shaft and No.6 Shaft and the eventual re-instatement of mining activities at the No.4 Shaft, No.1 Shaft and the No.2 Shaft will therefore cumulatively add to the impact and destruction of the deep geological strata.



Environmental Component	Cumulative impact description
Topography	The topography of the area has previously been impacted as a result of past and present mining activities surrounding the CAPM Orkney Gold Mine. However, as previously mentioned, the CAPM Orkney Gold Mine will not operate its own processing plant but rather transport the mined ore to the Nicolor South Plant for treatment. Therefore, CAPM Orkney Gold Mine does not and will not own, operate or manage any residue stockpiles. Therefore, the CAPM Orkney Gold Mine will not result in any impacts in terms of topography and therefore no cumulative impacts will be experienced.
Soil	As mentioned above, the CAPM Orkney Gold Mine is an existing gold mine and is surrounded by other gold mine operations. The soil has therefore likely to have already been impacted upon as a result of these past and present operations as well as the mine and plant residue stockpiles in the vicinity (not CAPM owned or managed). The re-instatement of operations at the CAPM Orkney Gold Mine may result in impact on soil as described in Part 4.2 above. This will result in a cumulative impact that will be direct and additive.
Land use and land capability	The land use and land capability of the areas on which the CAPM Orkney Gold Mine shafts are located have already been impacted upon. It is not anticipated that the re-instatement of operations at the shaft will further impact on the land use and land capability. However, a positive impact will be experienced during the closure and rehabilitation Phase as all redundant infrastructure will be removed and the surface area rehabilitated depending on the requirements of the DMR and the local municipalities. Therefore a countervailing interactive cumulative impact will be experienced as the net adverse cumulative impact is less than the sum of the individual impacts.
Surface Water	The potential impacts on surface water quality and quantity will be a direct and cumulative impact, as the CAPM Orkney Gold Mine is an existing gold mine and is surrounded by other gold mining operations, such as Anglo Gold Ashanti.
Groundwater	The CAPM Orkney Gold Mine is situated in close proximity to the town of Orkney and is surrounded by other deep gold mining operations and their related infrastructure (including mine and plant residue deposits). The groundwater resources have therefore already been impacted upon with the potential impacts resulting from the re-instatement of the CAPM Orkney leading to a direct and additive cumulative impact.



Environmental Component	Cumulative impact description
Vegetation	<p>The shaft areas and related infrastructure are all existing and therefore a direct impact as a result of vegetation removal is not anticipated. However, as described above Part 4.4 three protected species were identified within the No.4 Shaft and No.5 Shaft area. Should mining activities be conducted outside of the shaft surface areas, these protected species may be impacted upon and will therefore result in a direct and additive cumulative impact.</p> <p>Secondary grasslands have also been identified within several of the shaft surface areas. In the event that mining related activities are conducted within these secondary grassland areas, it would result in a cumulative impact that is direct and additive.</p> <p>Several species of declared weeds and invader species were identified on site. These weeds and invader plant species established on disturbed areas have a tendency to dominate or replace the canopy herbaceous layer of natural ecosystems, thereby transforming the structure, composition and function of natural ecosystems. Should these declared weeds and invaders species be allowed to continue to establish, it may result in a cumulative impact that is direct and additive.</p>
Animal life	<p>The study area provides potential habitat for 10 mammal taxa of conservation concern, of which, five (5) species may occur. Three (3) bird species of conservation concern are also likely to occur within the study area (refer to Part 4.5 above).</p> <p>These species as well as other species within the vicinity of the CAPM Orkney Gold Mine may be disturbed by noise or may be poached or hunted by employees and residents or possibly injured on site. This will result in a cumulative impact that is both additive and direct as there are other deep gold mining operations as well as residential areas, agricultural holdings and industries in the vicinity.</p>
Air quality	<p>The re-instatement of operations at the CAPM Orkney Gold Mine, as described in Part 4.9, may result in the generation of dust (ore transport) and the release of emissions (vehicles, fans) which may impact on the ambient air quality in the area. This may therefore result in a direct and additive cumulative impact as there are other existing deep gold mining operations as well as agricultural holdings in the vicinity.</p>
Noise	<p>Although the CAPM Orkney Gold Mine is an existing mine, the mine has been under care and maintenance since 2010. Therefore the noise emanating from the mine has been low in comparison to that of the mine at full production. A direct and additive cumulative impact will result from the re-instatement of operations at the various shaft, as the CAPM Orkney Gold Mine is surrounded by other deep gold mining operations.</p>



Environmental Component	Cumulative impact description
Visual	The infrastructure associated with the CAPM Orkney Gold and shaft areas are all existing and have been present for a long period of time. Therefore the residents and regular visitors to the area are likely to be desensitized to visual intrusion of the mining infrastructure. However, once the operations at the various shafts occur, the mining related activities, possible generation of dust, increased presence of people as well as the hauling mined material will have a direct and additive cumulative impact on visual aspects.
Sensitive landscapes	The No.7 Shaft and No.6 Shaft are not located within close proximity to any sensitive landscapes. However, As described above in Part 4.8, an assessment against the NFEPA classified wetlands was undertaken and it was found that the No.2 Shaft, No.3 Shaft and No.4 Shaft are in close proximity to NFEPA wetlands. In the event that the any impacts on the wetlands occur, this will result in direct and additive cumulative impact as these NFEPA classified wetlands are also in close proximity to other existing deep gold mining operations and there related infrastructure (including mine and plant residue stockpiles).
Sites of cultural and archaeological importance	As described above in Part 4.12, several structures located at the No.7 Shaft and several structures that were located at the No.3 Shaft are classified as heritages resources that are protected under the National Heritage Act, 1999 (Act No. 25 of 1999). In the event that these structures (with specific reference to the steel riveted headgear) are demolished without the appropriate authorisations from heritage authority, a direct and additive cumulative impact may be experienced.
Socio-economic	<p>Initially, the mine will create 471 jobs of which the majority of the employees (a minimum of 95%) will be sourced from the local community. This will result in a positive impact and therefore a countervailing interactive cumulative impact as this will decrease the unemployment levels of the local municipality.</p> <p>However, upon mine closure, retrenchment may occur and will result in a direct and additive cumulative impact on the unemployment in the area. As described in the SLP, the CAPM Orkney Gold Mine will conduct training, education and learnership programmes to minimize the effects of the impact.</p>



13. Proposed impact management objectives and the impact management outcomes for inclusion into the EMPr

Based on the assessment and where applicable the recommendations from specialist reports, the table below summarises the impact management objectives and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation.

Table 19: Impact management objectives and the impact management outcomes

Environmental aspect	Objective	Summary of impact management outcome
Geology	To minimise the destruction of the geological strata and to prevent the unnecessary loss of geology.	Monitoring of Mineral Resources and Reserves.
Soil	To prevent the loss of soil and soil fertility during the mining and mining activities.	Site inspection and monitoring programmes
Soil erosion	To prevent the loss of soil and soil fertility during decommissioning and rehabilitation activities.	Rehabilitation monitoring programme.
Land use and capability	To restore the land use and land capability to the agreed upon end land use, taking the recommendations of the DMR and municipalities into account.	Returning the land use of the area to agriculture and wilderness, depending of the outcome of the discussions with the DMR and the municipalities.
Flora	Prevent the destruction of vegetation and subsequent impacts species of conservation concern and protected species.	Implementation of a declared weed and invader plant species management programme. Site inspection and monitoring programme
Fauna	To minimise the destruction of faunal habitat and prevent fragmentation as far as possible.	Implementation of access control measures and training programmes
Surface water	To prevent quality deterioration of surface runoff generated and within the Shaft #1 area.	Implementation and upgrading of storm water management programme and infrastructure. Surface water monitoring programme.
	To prevent a decrease in catchment yield towards the Vaal River.	
	To prevent a decrease in surface water quality reporting to the downstream clean water environment.	
	To prevent a decrease in surface water quality generated and discharged from the Shaft #7 area.	



Environmental aspect	Objective	Summary of impact management outcome
	To prevent discharge of radio-active contaminated wash water into the clean water environment.	
	To prevent discharge of contaminated water into the clean water environment.	
Groundwater	To minimise the extent of disturbance of the aquifer	Groundwater monitoring programme.
	To minimise the extent of disturbance of the aquifer and deterioration of groundwater quality.	
Sensitive Landscapes	Prevent the discharge of contaminated surface water runoff and to prevent the degradation of sensitive landscapes (including wetland areas).	Implementation and upgrading of the storm water management programme and infrastructure.
Air quality	Prevent the deterioration of air quality and indirect effects on floral, faunal and human health	Air quality monitoring programme.
Noise	Prevent and mitigate against the effects of noise on sensitive receptors (including employees and surrounding communities and towns).	Noise monitoring programme.
Visual aspects	Prevent visual intrusions on sensitive receptors	Implementation of control measures to mitigate against visual intrusions.
Sites of archaeological and cultural importance	Re-assess the impact and identify the mitigation process to be followed	Obtaining of appropriate authorisations and permits.
	Prevent the destruction of National Heritage Resources	
Socio-economic aspects	Enhance the positive impact on the socio-economic aspects.	Sourcing of employees from the local community and surrounding areas.
	To mitigate against the effects of job loss.	Implementation of measures to train employees to ensure future employment opportunities.
	To mitigate the effects of the influx of job seekers to the area.	Sourcing of employees from the local community and surrounding areas. Implementation of measures indicated in the SLP.
	To prevent and / or limit public exposure to unacceptable health risks.	Implement control measures both on-site and off-site.

