

**PART B: ENVIRONMENTAL MANAGEMENT
PROGRAMME REPORT**

Disclaimer

This EMPr has been amended as part of the Regulation 31 amendment process to amend the 2020 Approved Environmental Management Programme (EMPr) to correct the heights of five Waste Rock Disposal Facilities. The Regulation 31 Amendment is associated to the Environmental Authorisation Reference: **P 30/5/1/2/3/2/1 (050) EM.**

The 2020 Approved EMPr was compiled by SRK Consulting and acknowledgement is given to the authoring company. This EMPr is taken verbatim from the 2020 approved EMPr and changes made by Alta van Dyk Environmental Consultants are represented as a strikethrough and insertions are highlighted in grey.

The structure of the EMPr in terms of Appendix 4 of the 2014 NEMA Regulations, as amended is provided in Table 29-1.

Table 29-1: Structure of the EMPr report in terms of Legislation Requirements as detailed in Appendix 4 (contents of an EMPr of GNR 982)

Appendix 4	Legislated requirements as per the NEMA GNR 982 in Appendix 4	Relevant Report Section
(1)(a)	details of-	
	(i) the EAP who prepared the EMPr	Section 2.1 and Section 29.1.1
	(ii) the expertise of the EAP, including a curriculum vitae;	Section 2.2 and Section 29.1.1
(1)(b)	A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description	Section 6
(1)(c)	a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;	Figure 6-1 and Figure 6-2
(1)(d)	A description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including-	Section 18
	(i) planning and design;	
	(ii) pre-construction activities;	
	(iii) construction activities;	
	(iv) rehabilitation of the environment after construction and where applicable post closure; and	
(1)(e)	<i>Removed from Appendix 4 during 2017 NEMA Regulations Amendment and included in 1 (f) below</i>	
(1)(f)	a description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable, include actions to -	Sections 18 and 23
	(i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;	
	(ii) comply with any prescribed environmental management standards or practices;	
	(iii) comply with any applicable provisions of the Act regarding closure, where applicable; and iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable	

Appendix 4	Legislated requirements as per the NEMA GNR 982 in Appendix 4	Relevant Report Section
(1)(g)	the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 31
(1)(h)	the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	
(1)(i)	an indication of the persons who will be responsible for the implementation of the impact management actions;	
(1)(j)	the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	
(1)(k)	the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	
(1)(l)	A program for reporting on compliance, taking into account the requirements as prescribed by the Regulations	
(1)(m)	an environmental awareness plan describing the manner in which-	
	(i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and	Section 31.6
	(ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and	
(1)(n)	any specific information that may be required by the competent authority	Section 31.7
(2)	Where a government notice gazette by the minister provides for a generic EMPr, such generic EMPr as indicated in such notice will apply.	Not Applicable

29 PART B: ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

29.1 Final environmental management programme

29.1.1 Details of EAP

Refer to Section 2.1 for the details of the EAP. (SRK Consulting Details)

Alta van Dyk Environmental Consultants

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Kirthi Peramaul (BSc Hons Environmental Monitoring and Modelling, Pr.Sci.Nat, Registered EAP). Kirthi has 13 years' experience in the environmental management field and is currently registered with the South African Council of Natural Scientific Professions (SACNASP) as a Professional Natural Scientist (Registration No 400012/18: Environmental Science) and as a Registered Environmental Assessment Practitioner with the Environmental Assessment Practitioners Association of South Africa (EAPASA) (Registration No 2020/1537). Kirthi specialises in environmental authorisations, environmental compliance monitoring, environmental management plans, water use authorisation, stakeholder engagement, risk assessments and blue and green drop auditing. She has been involved in projects related to Waste Management, Linear Infrastructure, as well as Mixed-Use developments

Suzanne van Rooy (MPhil Environmental Management, Pr.Sci.Nat, Registered EAP). Suzanne has been involved in the field of environmental management for the past 13 years. She holds a Master's degree in Environmental Management from the University of Stellenbosch. She is registered as a Professional Natural Scientist with the SACNASP (Registration No. 400378/11: Environmental Science) and as Registered Environmental Assessment Practitioner with the Environmental Assessment Practitioners Association of South Africa (EAPASA) (Registration No 2019/1079). Her expertise is in the mining industry sector, focusing on Risk Assessments, Environment Authorisation processes, Water Use Licence Applications, due diligence and integrated regulatory processes. Her involvement in such projects varies from project management and co-ordination, to the compilation and review of technical and environmental documents and reports.

29.1.2 Description of the aspects of the activity

Refer to Section 6 of the report that detailed the aspects related to this activity.

29.1.3 Composite map highlighting sensitive areas

The broad placement of the surface infrastructure was informed by mapping the environmental sensitivities which considered the location of all known sensitive physical, social and environmental features within the mining rights and surface lease areas (Figure 29-1). The environmental sensitivities that were taken into account have been included in Table 29-1:

Table 29-1: Environmental sensitivities

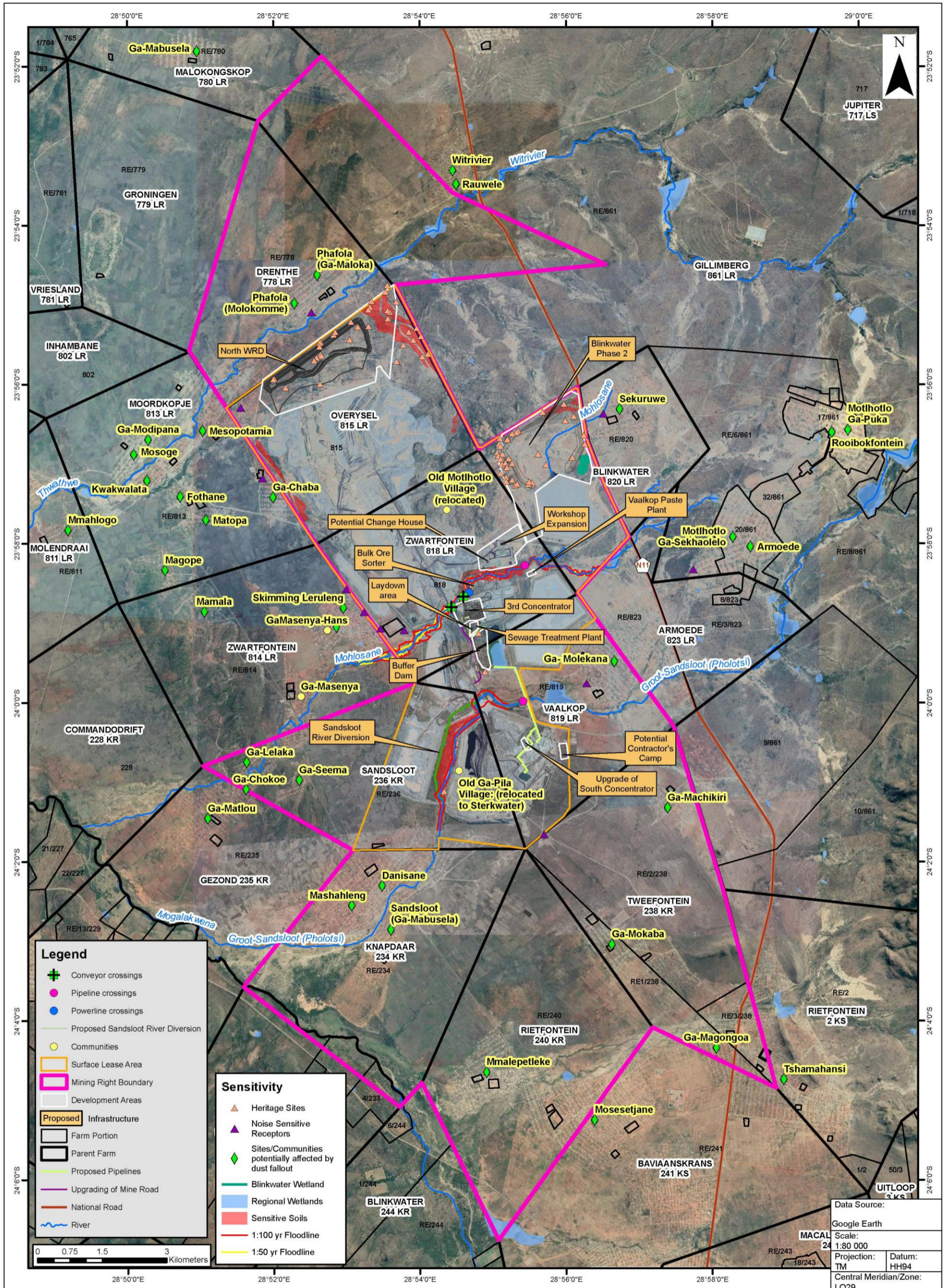
Sensitive feature	Description
Cultural heritage sits	Heritage sites have been found located within the proposed project area. These include archaeological and heritage sites located within the Blinkwater 2 TSF footprint and the North WRD area.
Noise sensitive receptors	Sensitive noise receptor areas during the construction and operational phases have been identified and include the receptors in close proximity to the proposed M3C, Blinkwater 2 TSF and North WRD.
Wetland	The wetland identified to the north east of the Blinkwater 1 TSF is considered to be a sensitive area. A 50 m buffer zone has been created around the wetland. The natural but largely modified wetland can be classified as a hill slope seepage wetland in accordance with SANBI's Classification System for Wetlands.
Soils	The mining and associated support activities being proposed could, if not well managed, have a moderate to high negative impact on the surface conditions. This is especially true of the areas being considered for the Groot Sandsloot River Blinkwater 2 TSF and North WRD.
Air Quality (dust sensitive receptors)	Sensitive receptors located in close proximity to the mine will be affected by the proposed expansion project, however, the predicted increase in dust levels at these receptors will remain below the PM10, PM2.5 and dust fallout standards. However, the increase may lead to nuisance levels of dust at these sensitive receptors.
The Sandsloot River	The Groot Sandsloot River is a sensitive area that will be impacted on by the proposed river diversion. It will have a negative impact on the river habitat and vegetation. The whole river channel and associated flood plain will be lost due to the proposed river diversion.
Witvinger Nature Reserve	The Witvinger Nature Reserve (WNR) is located in the Waterberg District of Limpopo Province, South Africa and is situated approximately 80 km to the west of Polokwane and 17 km to the north of Mokopane. This reserve has unique features and beautiful landscapes, important cultural attributes and a vast biodiversity aspect connected with a community surrounding this unique and special reserve. The reserve is 5 400 ha in extent, and it is a proclaimed Nature Reserve. The reserve has a variety of habitats and landscape, including open plains and mountains. Wildlife species include bushbuck, kudu, reedbuck, Tsessebe, Leopard and Zebra. The proposed Expansion Project will not impact on the Witvinger Nature Reserve.
Visual	<p>The Mogalakwena Mining area is located within the Mogalakwena Local Municipality and is bordered by the following communities as visual receptors to the mine and its associated infrastructure (Waste Rock Disposal Facilities): the community villages of Phafola to the north, Ga-Modipana, Mesopotani and Ga-Mosege to the north-west, Ga-Tshaba, Mapela and Ga-Masanya to the west, Ga-mapela to the west and south-west, Ga-Molekana, Ga-Sekhaolelo and Sekuruwe to the east.</p> <p>The majority of the visual receptors within the Zone of Visual Influence (ZVI) are residential areas (community clusters) and has been deemed HIGHLY sensitive visual receptors.</p>

Buffer distances (minimum safe distances), determined primarily from legislation, including GN704 and the MHSA (Table 29-2), were then overlain on the sensitive areas mapped. The placement of proposed site infrastructure options in relation to the identified sensitive areas is shown in Appendix 19. Following the completion of the scoping phase, input from I&APs and the findings of the specialist studies were used to refine the preferred development footprint. The specialist studies did not identify any fatal flaws associated with any of the infrastructure site layout options.

Table 29-2: Buffer distances associated with the Mogalakwena Mine Expansion Project

Infrastructure	Buffer (m)	Legislation/comment
Buildings Roads Railways TSF and WRD Structures	100	MHSA and Regulations
Restricted areas	50	MHSA GN93
Watercourses	100	NWA GN704
Wetlands	500	NWA GN704 GN1199
Potential sensitive receptors	500	A buffer has been suggested for noise, dust and air quality impacts
Powerlines	25	A proposed buffer (either side of centre-line) for protection of powerline infrastructure
Explosives magazine	500	A proposed buffer for safety and avoidance of damage to new infrastructure (in the event of an explosion)

The current activities and infrastructure at Mogalakwena Mine are given in 4.2 Section and shown Appendix 12.



MOGALAKWENA MINE EXPANSION PROJECT
SENSITIVITY MAP

Path: J:\Proj\532330_MM_3RD_CONCENTRATOR\GIS\GISPROJ\MXD\IEIA\532330_A3P_MM_3rd Concentrator_SensitivityMap_FullExtent_Temp_20191003.mxd

Figure 29-1: Sensitivity map

29.2 Description of impact management objectives including management statements

29.2.1 Determination of closure objectives

The closure objectives detailed in Section 30.1 are based on an extensive environmental database and baseline information gathered during the LoM so far, as well as the baseline studies undertaken as part of the specialist investigations, as detailed in Section 14.

A baseline closure risk assessment was undertaken during 2016 using the Anglo American Plc risk assessment process, where the risk is described and then a determination is taken to assess the nature of the risk and then the risk is ranked according to predetermined criteria for probability and consequence. This baseline was subsequently updated in 2017 and 2018. For purposes of this report, the 2018 risk assessment has been updated to reflect possible closure risks associated with the Expansion Project. The nature of the risks requiring mitigation were used to inform the closure objectives.

29.2.2 Process for managing any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of undertaking a listed activity

Through the implementation of the management measures by the relevant responsible persons, any potential environmental impact associated with undertaking listed activities associated with the proposed project will be managed accordingly.

29.2.3 Potential risk of acid mine drainage

Geochemical characterization and waste classification were undertaken on 40 samples from the Mogalakwena Mine to evaluate the acid generation potential and neutralisation potential of the orebody, country rock, waste rock and tailings. From the results of the classification the following can be concluded:

- All materials sampled have a low potential to generate acidity, with all the samples, with the exception of a single medium grade pyroxenite ore, having a sulphur content below the recommended threshold of 0.3%. In addition, testing indicates that there is an excess of neutralising material providing sufficient buffering capacity, associated with the different lithologies. The testing therefore indicates that the leachate potential generated from residue facilities is likely to be neutral during operations, closure and post closure.
- The results to date support the conclusions from the previous geochemical testing work undertaken by SRK (2002) that the waste rock dump should not produce a leachate with low pH and high sulphate concentrations, although manganese was flagged as a potential metal of concern in seepage from the waste rock dump.
- Waste characterization of the tailings material (SRK 2015) from the Mine was found to be non-acid generating. However due to the As, Cu, Mn and Ni > leachable concentration threshold (LCT0), the tailings were classified as Type 3 material requiring disposal in a landfill engineered with a Class C or equivalent barrier system.
- The samples from the tailings, WRD and pit wall samples had B, Ba, Cu, Ni, Pb, V and Zn exceeding the total concentration threshold TCT0 in some samples but not the TCT1 limits ($TCT0 < TC < TCT1$). The LCT0 threshold was not exceeded in any of the samples (Itasca, 2018).
- Based on the results of the Itasca 2018 Waste Classification, most of the samples from both the tailings material, ore stockpile and WRD fall within the category $TC \leq TCT1$ AND $LCT0 < LC < LCT1$ and are classified as Type 3 waste requiring a Class C or Class C equivalent barrier system.
- Lining of the WRD area is impractical and not likely to be effective in the longer term. Consideration should be given to the design and preparation of the footprint area of the proposed North WRD to minimise the risk of seepage from the WRD from reaching the groundwater.

Although the geochemical characterization indicates a low risk of acid generation from the waste rock dump and tailings materials, leaching of sulphate, nitrate and chloride may result in increased salt loading to the groundwater and must be taken into consideration in the design for the proposed new facilities i.e. Blinkwater 2 TSF and North WRD.

29.2.4 Water use licence requirements

MM currently operates under several existing approved Environmental Management Programmes (EMPrs) (refer to Figure 1-2) and two Water Use Licences (WULs) (approved in March 2007 and October 2017). A WUL is being applied for as part of the integrated environmental authorisation process for the Expansion Project. As agreed with DWS at the pre- application meeting, the water uses from the 2007 and 2017 WULs be consolidated and included in the new WULA for the Mogalakwena Mine expansion project.

Table 29-3 provides a summary of the infrastructure units and associated existing water uses at Mogalakwena Mine with the proposed new water uses associated with the Expansion Project. ~~in grey text~~. The new water uses associated with the proposed Expansion Project are shown in Appendix 17. Further details on the proposed Expansion Project infrastructure is provided in Section 6 and details relating to the existing infrastructure is provided in Section 8.

Table 29-3: Existing water uses and proposed new water uses associated with the Expansion Project

Farm	Section 21 Water Uses		Infrastructure
	Description		
Overysel 815 LR	a	Abstraction of groundwater 2 Ml/d	<ul style="list-style-type: none"> • PPL Wellfield (Including on the farms Vaalkop 819 LR, Zwartfontein 818 LR, and Sandsloot 236 KR)
	j	Removing water found underground	<ul style="list-style-type: none"> • PPRust North open pit
	g	Disposing of water containing waste	<ul style="list-style-type: none"> • PPRust north open pit • West WRD • East WRD • Rock dump runoff dam (runoff from pit and WRD) No. 1 • Roads (irrigation of roads with water containing waste for dust suppression) • Zinc dam north (pit water for use as dust suppression on roads) • North NRD and associated ore stockpiles
Blinkwater 820 LR	c	Impeding or diverting the flow of water in a water course	<ul style="list-style-type: none"> • Tailings dams 1 & 2 (diversion of headwaters, due to positioning of the Blinkwater TSF on the Mohlosane River) • Boundary fence • East diversion channels around the Blinkwater TSF • West diversion channels around the Blinkwater TSF • Blinkwater TSF 2 Cleanwater Diversion • Blinkwater 1 and 2 TSF within 500 m of a wetland • Groundwater feed via channel to wetland 1 • Groundwater feed via channel to wetland 2 • Stormwater feed via channel to wetland • Blinkwater TSF 1 Protection Berm
	i	Altering the bed, banks, course or characteristics of watercourse	<ul style="list-style-type: none"> • Tailings dams 1 & 2 (diversion of headwaters, due to positioning of the Blinkwater TSF on the Mohlosane River) • Boundary fence • East diversion channels around the Blinkwater tailings dam • West diversion channels around the Blinkwater TSF • Blinkwater TSF 2 Cleanwater Diversion • Blinkwater 1 and 2 TSF within 500 m of a wetland • Groundwater feed via channel to wetland 1 • Groundwater feed via channel to wetland 2 • Stormwater feed via channel to wetland • Blinkwater TSF 1 Protection Berm

Farm	Section 21 Water Uses		Infrastructure
	Description		
	g	Disposing of water containing waste	<ul style="list-style-type: none"> • Tailings dams • Roads (irrigation of roads with water containing waste for dust suppression) • Blinkwater 2 Tailings Storage Facility
Zwartfontein 818 LR	a	Abstraction of groundwater 2 Ml/d	<ul style="list-style-type: none"> • PPL Wellfield (including on the farms Vaalkop 819 LR, Overysel 815 LR, and Sandsloot 236 KR) • MNC dewatering boreholes (incorporated into • PPL wellfield • Five new pollution control dewatering boreholes along Mohlosane River
	c	Impeding or diverting the flow of water in a water course	<ul style="list-style-type: none"> • Conveyer and adjacent road crossing river • Haul road bridge over Mohlosane River • Pipeline crossing • Portion of west clean water diversion channel • Haul road crossing • Bridge, ford and conveyor crossing • Access road crossing • Service road crossing • Two tar road crossings • Potable water pipeline and lattice bridge • Two tailings return water pipeline crossing and adjacent road • Two haul road crossings • RWD Extension • Permanent Retaining Walls PRW 1 to PRW 3 • Gantry crossing the Mohlosane River carrying pipelines • Powerline 1 crossing Mohlosane River • Powerline 2 crossing Mohlosane River • Conveyor Crossing 1 over the Mohlosane River to the third concentrator • Conveyor crossing 2 over the Mohlosane River to the third concentrator • Conveyor crossing 3 over the Mohlosane River to the third concentrator • Conveyor crossing 4 over the Mohlosane River to the third concentrator • Conveyor crossing 5 over the Mohlosane River to the third concentrator • Conveyor crossing service road 1 over the Mohlosane River to the third concentrator • Conveyor crossing service road 2 over the Mohlosane River to the third concentrator • Vehicle access road 1 over the Mohlosane River to the third concentrator • Vehicle access road 2 over the Mohlosane River to the third concentrator • Conveyor crossing service road 3 over the Mohlosane River to the third concentrator

Farm	Section 21 Water Uses		Infrastructure
	Description		
	i	Altering the bed, banks, course or characteristics of a watercourse	<ul style="list-style-type: none"> • Conveyer and adjacent road crossing River • Haul road bridge over Mohlosane River • Pipeline crossing • Portion of west clean water diversion channel • Haul road crossing • Bridge, ford and conveyor crossing • Access road crossing • Service road crossing • Two tar road crossings • Potable water pipeline and lattice bridge • Two tailings return water pipeline crossing and adjacent road • Two haul road crossings • RWD extension • Temporary coffer walls (CW 1 to CW 9) • Permanent retaining walls (PRW 1 to PRW 3) • Temporary filter walls (TFW 1 and TFW 2) • Gantry crossing the Mohlosane River carrying pipelines • Powerline 1 crossing Mohlosane River • Powerline 2 crossing Mohlosane River • Conveyor Crossing 1 over the Mohlosane River to the third concentrator • Conveyor crossing 2 over the Mohlosane River to the third concentrator • Conveyor crossing 3 over the Mohlosane River to the third concentrator • Conveyor crossing 4 over the Mohlosane River to the third concentrator • Conveyor crossing 5 over the Mohlosane River to the third concentrator • Conveyor crossing service road 1 over the Mohlosane River to the third concentrator • Conveyor crossing service road 2 over the Mohlosane River to the third concentrator • Vehicle access road 1 over the Mohlosane River to the third concentrator • Vehicle access road 2 over the Mohlosane River to the third concentrator • Conveyor crossing service road 3 over the Mohlosane River to the third concentrator
	j	Removing water found underground.	<ul style="list-style-type: none"> • PPRust north open pit (including central and south pits) • Zwartfontein south open pit • MNC dewatering boreholes
	g	Disposing of water containing waste	<ul style="list-style-type: none"> • West WRD • East WRD • Pollution control dam (PCD) • WRD run off pollution control dam • MNC pollution control dam: excess plant water and runoff (PCD-NC) • Mining complex stormwater dams 1 & 2 – truck and heli pollution control dams

Farm	Section 21 Water Uses		Infrastructure
	Description		
			<ul style="list-style-type: none"> • MNC sewage works (sewage effluent reused in the process) • Contractors camp sewage works • Landfill site with dirty water dam • RWD extension (tailings return water) • Vaalkop TSF 1 & 2 • Zinc dam central (pit water for use as dust suppression on roads) • Zinc dam wash bay (plant water from MNC for use as dust suppression on roads) • Roads (irrigation of roads with water containing waste for dust suppression) • Ore stockpiles • Concentrator Pollution Control Dam • M3C Bulk Ore Stockpile 1 (low grade) • M3C Bulk Ore Stockpile 2 (low grade) • M3C Bulk Ore Stockpile 3 (low grade) • M3C Bulk Ore Stockpile 4 (low grade) • M3C high grade ore stockpile • Buffer Water Storage Dam
Vaalkop 819 LR	a	Abstraction of groundwater 2 M ³ /d	<ul style="list-style-type: none"> • PPL wellfield (including on the farms Overysel 815 LR, Zwartfontein 818 LR, and Sandsloot 236 KR)
	c	Impeding or diverting the flow of water in a water course	<ul style="list-style-type: none"> • Pipeline and haul road crossing • Bridge crossing the Groot Sandsloot River carrying pipelines and upgrade of existing access road
	i	Altering the bed, banks, course or characteristics of watercourse	<ul style="list-style-type: none"> • Pipeline and haul road crossing • Bridge crossing the Groot Sandsloot River carrying pipelines and upgrade of existing access road
	j	Removing water found underground	<ul style="list-style-type: none"> • Zwartfontein south open pit
	g	Disposing of water containing waste	<ul style="list-style-type: none"> • Vaalkop TSFs 1 & 2 • RWD and portion of extension - tailings return water • Southern concentrator sewage works - sewage effluent reused in the process • Dam 1160 - pit water and treated sewage effluent • SP dam - runoff from workshop in settling pond (in series with sump) • Erichsen dam - process water at MSC • SWS dam - runoff from workshop in stormwater sump dam (in series with settling pond) • OS1 (oil sump) • OS2 (old and new dams) - water from workshop oil trap stored in oil sump dam • Roads - irrigation of roads with water containing waste for dust suppression

Farm	Section 21 Water Uses		Infrastructure
	Description		
			<ul style="list-style-type: none"> • Zinc Dam ZFT - (pit water for dust suppression on roads) • Landfill site • WRD W07 (Sandsloot and Vaalkop) • Ore stockpiles
Sandsloot 236 KR	c	Impeding or diverting the flow of water in a water course	<ul style="list-style-type: none"> • Haul road over culvert crossing • Culvert • Diversion of the Groot Sandsloot River
	i	Altering the bed, banks, course or characteristics of watercourse	<ul style="list-style-type: none"> • Haul road over culvert crossing • Diversion of the Groot Sandsloot River
	j	Removing water found underground	<ul style="list-style-type: none"> • Sandsloot open pit • Portion of Zwartfontein open pit
	g	Disposing of waste rock	<ul style="list-style-type: none"> • WRD RS3 • WRD W07 (Sandsloot and Vaalkop) • Ore Stockpile SS, ZWS
Blinkwater 244 KR and Rietfontein 240 KR	a	Abstraction of 1.8 Ml/day	<ul style="list-style-type: none"> • Blinkwater wellfield
Molendraai 811 LR, Moordkopje 813 LR, Commandodrift 811 LR.	a	Abstraction of 1.0-1.4 Ml/d	<ul style="list-style-type: none"> • Commandodrift wellfield

29.2.5 Impacts to be mitigated in their respective phases

The impact assessment in Section 18 details the potential impacts associated with proposed Expansion Project during the pre-construction, construction, operational, closure and rehabilitation and post closure phases.

29.2.6 Impact management outcomes

In addition to the implementation of the management measures detailed in Sections 18 the compliance standards, that are applicable to the identified impacts are included in Table 19-2 below.

Table 19-2: Compliance Standards to be achieved with regards to social and environmental aspects

Environmental aspect	Phase/Time period	Standard to be achieved	Compliance with standards
Soils, Land Use and Land Capability Terrestrial Ecology	Continuous during construction, operations and closure.	To prevent soil contamination by implementation of: <ul style="list-style-type: none"> • Inspection and maintenance Plan; • Leak/Spill Procedure' • Emergency Preparedness Plan; • Waste Management; and 	Manage soils in line with the requirements of the National Norms and Standards for the Remediation of Contaminated Land and Soil Quality (GN 37603 No 331). Anglo American Policies and Guidelines to manage and remediate spills.
	Continuous during construction, operations and closure.	To demonstrate active stewardship of land and biodiversity by: <ul style="list-style-type: none"> • Identifying and removing relevant species if necessary; 	Anglo American Biodiversity Performance Standards Manage soils in line with the requirements of the National Norms and Standards for the Remediation of Contaminated Land and Soil Quality (GN 37603 No 331). Anglo American Policies and Guidelines to manage and remediate spills. GNR 893 Minimum Emission Standards.
Surface water	Continuous during construction, operations and closure.	To avoid or where not possible, minimise and remedy pollution of water <ul style="list-style-type: none"> • Implementing a Leak/Spill Procedure; • Continuously implementing the surface water monitoring programme; • Compiling monitoring report; • Implementing Stormwater Management Plans; and • Responding to complaints and implementing a grievance mechanism. • Compliance to WUL 	Water Quality Objectives as specified in the Water Use License issued by DWS Anglo American Policies and Guidelines to manage and remediate spills.
Groundwater	Continuous during construction, operations and closure.	No dirty water spillage to the catchment thereby preventing contamination of waterbodies downstream by: <ul style="list-style-type: none"> • Continuously implementing the groundwater monitoring programme and model; and 	Anglo American Policies and Guidelines to manage and remediate spills. Water Quality Objectives as specified in the Water Use License issued by DWS

Environmental aspect	Phase/Time period	Standard to be achieved	Compliance with standards
		<ul style="list-style-type: none"> Responding to complaints and implementing a grievance mechanism with regards to groundwater. Compliance to WUL 	
Air Quality	Continuous during construction, operations and closure.	<p>To minimise the entrapment potential of dust.</p> <ul style="list-style-type: none"> To keep PM₁₀ (and in the future, PM_{2.5}) and dust fallout levels at key receptor sites around the project area within guideline levels. As the guidelines vary depending on the priority area and year, the South African Air Quality Information System (http://www.saaqis.org.za/) will be consulted for the most recent guidelines. <p>These aforementioned standards will be achieved by:</p> <ul style="list-style-type: none"> Continuously implementing the dust monitoring programme; and Appropriate dust suppression techniques. 	<p>GNR 893 Minimum Emission Standards.</p> <p>Anglo Air Quality Performance Standards.</p>
Noise	Continuous during construction, operations and closure.	<p>To minimise noise impacts on sensitive receptors by:</p> <ul style="list-style-type: none"> Developing a complaints register to record complaints regarding noise. To maintain noise levels at the standards for suburban areas (SANS 10103) as far as practicable. 	<p>Compliance with SANS 10103 Acceptable Ambient Levels and SANS 10210 of 2004, the national standard for the calculating and predicting of road traffic noise</p> <p>SANS 10328 of 2008</p> <p>Noise Control Regulations – General Notice R154 of 10 January 1992</p>
Heritage	Continuous during construction, operations and closure.	To ensure heritage resources are not damaged during the mining process	<p>Ordinance on Excavations (Ordinance no. 12 of 1980) (replacing the old Transvaal Ordinance no. 7 of 1925).</p>
Social	Continuous during construction, operations and closure	<p>To enhance benefits from the development of the Project;</p> <p>To maximize opportunities for local residents;</p> <ul style="list-style-type: none"> To facilitate employment of local labour on the Mine; and To avoid creating unrealistic expectations. <p>These standards will be achieved by the implementation of the SLP and Social Management Plan, SED Plan, Stakeholder Engagement Plan and other Social Performance policies, procedures and plans.</p>	<p>Anglo American Closure Toolbox.</p> <p>Anglo American Social Way</p> <p>Anglo American Environmental Way</p>
Visual	Operational and Closure Phase	<ul style="list-style-type: none"> To reduce the visual impact of the operational mine. To leave behind a rehabilitated mining site that, in general, is not only neat and tidy, giving an acceptable overall aesthetic 	<ul style="list-style-type: none"> Implementation of a Waste Rock Deposition Strategy and Final Rehabilitation Plan

Environmental aspect	Phase/Time period	Standard to be achieved	Compliance with standards
		<p>appearance that does not compromise the planned end land use.</p> <ul style="list-style-type: none"> • Proper benching to promote easier rehabilitation and vegetation cover to ease visual intrusion and promote visual absorption capacity. • Deposition Strategy that takes into consideration end-of Life of Mine and end land-use management. • Benching that allows for proper stormwater management on side slopes of the Waste Rock Disposal Facilities that promotes rehabilitation and vegetation cover and reduce risk of erosion and gully formation. • The implementation of air quality mitigation measures to reduce fugitive dust generation and possible additional visual intrusion thereof. 	

30 Financial provision and closure plan

The information provided in this section is sourced from the closure plan developed for the proposed Expansion Project (Refer to Appendix 18).

The infrastructure and activities associated with the proposed Expansion Project will increase the existing Mogalakwena Mine liability by an amount of R 189 713 390.54.

AAP will provide for the closure liability associated with the project through the purchase of a Bank Guarantee as allowed by the Financial Provision for Prospecting, Exploration, Mining or Production Operations Regulations, with the Bank Guarantee provided to the DMR following authorisation of the Expansion Project.

30.1 Closure Objectives

Closure objectives for Mogalakwena Mine have been developed as part of the closure plan and include the following:

- Adhere to all statutory and other legal requirements.
- To develop landforms and land-uses that are stable, sustainable and aesthetically acceptable on closure.
- Ensure safety & health of all stakeholders during closure and post closure and that communities using the site after closure are not exposed to unacceptable risks.
- Ensure that closure supports productive uses, where practical, considering pre-mining conditions and agree with commitments to with stakeholders.
- Physically and chemically stabilise remaining structures to minimise residual risks.
- Promote biodiversity and biological sustainability to the maximum extent practicable.
- Utilize closure strategies that promote a self-sustaining condition with little or no need for ongoing care and maintenance.
- To achieve agreed quality targets set by the Catchment Management Agency (CMA) and the DWS as far as practical relative to impacts and reasonability to achieve.

The infrastructure associated with the Expansion Project which will be rehabilitated is provided in Figure 6-2 and described in Section 6.

The closure objectives listed above were based on an extensive environmental database and baseline information gathered during the LoM so far, as well as the baseline studies undertaken as part of the specialist investigations as detailed in Section 14.

Although the final closure quantum will be refined once the project is completed, commissioned and fully operational, SRK is of the opinion that the estimate of liability is a reasonable reflection of the anticipated closure costs and is of the opinion that the liability is sufficient for the operation to adhere to the closure objectives.

A baseline closure risk assessment was undertaken during 2016 using the Anglo American Plc risk assessment process, where the risk is described and then a determination is taken to assess the nature of the risk and then the risk is ranked according to predetermined criteria for probability and consequence. This baseline was subsequently updated in 2017 and 2018. For purposes of this report, the 2018 risk assessment has been updated to reflect possible closure risks associated with the Expansion Project. These risks and the mitigation thereof informed the development of the closure objectives.

30.2 Consultation with landowners and interested and affected parties

The objectives in relation to closure as detailed in Section 30.1 and rehabilitation will be made available for landowner and public consultation as part of the public participation process detailed in Sections 13.6 and 13.7.

30.3 Rehabilitation Plan

The final rehabilitation plan will only be developed once sufficient information is collected from the monitoring of areas where rehabilitation concurrent with mining activities has been undertaken. The learnings from the areas already rehabilitated will be utilised to inform scientifically sound, safe and technically feasible solutions to achieving the rehabilitation objectives. The intention of the plan will be to achieve the objectives in Section 30.1.

30.4 Closure Actions

The rehabilitation actions that the operation intends undertaking at the end of the life of the Expansion Project are described below, with these based on the closure actions for the remainder of the operation as described in the Final Decommissioning, Rehabilitation and Closure Plan (FDRCP) (SRK, 2018). These actions are designed to comply with the requirements of this rehabilitation plan's objectives and the requirement for the development of risk mitigation closure strategies identified during the risk assessment.

30.4.1 ~~North Waste Rock Dump~~ Waste Rock Disposal Facilities

The strategy will be to undertake closure activities that will result in a stable landform, capable of supporting a vegetation community analogous with surrounding grasslands, where the generation of contact water and sediment laden runoff is limited by the incorporation of appropriate covers in the closure design. Aesthetics associated with the dumps will be improved as a consequence of the establishment of vegetation on these facilities.

Trials will be undertaken to identify the optimal closure slope angles, with there being a possibility that different angles can be used on different positions on the dump and on different morphological aspects. It is likely that the closure angles will be between 18° to 24°.

Historical information indicates that opportunistic vegetation is limited, implying that a form of growth medium is required. During operations, trials will be conducted to determine whether there is a blend of saprolite and topsoil that can be formed to sustain vegetation, without the blend being dispersive and subject to slumping and erosional influences. The cover placement strategy, after reshaping to the desired angle, is likely to include:

- Growth medium placed on the lower slopes of all facilities. This is required to limit sediment washout from higher up the slopes, migrating to the toe of the facilities. It is also required to limit sediment generation from the lower slopes. Vegetation will be established in line with the Vegetation Management Plan (VMP) that will be developed to support revegetation activities at the mine.
- Islands of growth medium placed on the higher slopes to form nodes from which plants may be distributed to other portions of the slopes. The size and spacing of these nodes will be determined from field trials established during the operational period. Vegetation will then be established in line with the VMP.
- The top surfaces of all facilities may require cover with growth medium and vegetation establishment to limit dust generation. Trials will be conducted to determine whether saprolite with appropriate ameliorants will support a vegetation population on these surfaces.
- Access ramps to the top of the dumps will remain while the top is being reclaimed. Once complete, ramps will be reshaped to a profile similar to the rest of the dump.

Where the potential exists, as determined by the physical and geochemical characteristics of the waste rock, the waste rock facilities will remain open for processing by third parties.

30.4.2 Tailings storage facility

Closure activities that will result in a stable landform capable of supporting a vegetation community analogous with surrounding grasslands, where the generation of contact water is limited by the incorporation of vegetation covers in the closure design, will be implemented for Blinkwater 2 TSF. This is in line with the requirements for the existing Blinkwater 1 TSF.

Closure actions will include the following:

- As there is a negative meteoric water balance, excess inventory on the TSF's and in the Return Water Dams will be evaporated and no active dewatering is anticipated.
- All civil structures not required for the management of the facility will be decommissioned, which includes the backfilling of the decant structures.
- The final design profile of the Blinkwater 2 TSF will be downstream embankment at a slope of 2.4H: 1V slopes. Reshaping requirements will be assessed based on the outcomes of the vegetation trials to be undertaken by Mogalakwena Mine on the operational WRDs. Vegetation will then be established in line with the requirements of the VMP.
- A system of paddocks created on the top surface may limit vegetation establishment, depending on how saturated these paddocks remain. Therefore, storm water management will include the construction of spillways discharging to the environment to manage the 1:100 year return flood events, rather than containing water for evaporation in paddocks on the top surface. Mogalakwena Mine assumes that the quality of the contact water will achieve discharge standards, particularly as there will be limited evaporative concentration of any rain water falling on the surface.
- During the final stages of the life of the TSF, deposition will be undertaken to achieve a beach which drains towards the spillways on each of the facilities.
- Experience indicates that vegetation can be established directly onto the surface of the tailings without the placement of growth medium. Therefore, vegetation will be established straight onto the tailings surface. However, a growth medium cover will be required on the rock embankments. Given the material size distribution on the embankment, an intermediate cover of crushed waste rock may be required to provide a more homogenous surface for growth medium placement. The requirement for this will be determined during future iterations of the closure plan. Vegetation will be established in line with the requirements of the VMP.
- Energy dissipaters will be used on the downstream side of the conveyance structure from the spillway to reduce velocity prior to discharge of the water to the receiving water body.
- The existing seepage control structures at the toe of the TSF will be retained for the closure period.

30.4.3 Concentrators and associated infrastructure

All infrastructure for which there is no approved third party post closure (either at the proposed M3C or at the upgrades to the MNC) use will be decommissioned and the footprints reclaimed for the establishment of grasslands. Infrastructure where there is a third party use will be legally transferred to the relevant third parties.

Material inventories will be managed near the end of operations to minimize any surplus materials at closure. Fuel, lubricants and other materials needed to support the closure activities will be utilized during the closure period. The majority of the fuel storage facility will be closed during the first year of operations, but some fuel storage capacity will be required until all equipment has been demobilized from the site at the end of the closure period.

Where practicable, equipment and materials with value not needed for post closure operations will be sold and removed from the site. All other equipment will be demolished and disposed of on-site. Equipment with scrap or salvage value will be removed from the plant and stored either in the existing salvage yard or a facility designated for this purpose during the closure period.

A soil contamination investigation will be conducted on completion of demolition activities, particularly in excavations remaining open following decommissioning. The purpose of this will be to identify areas of possible contamination and design and implement appropriate remedial measures to ensure that the soil closure criteria are obtained.

Excavations remaining following demolition, foundation and slab removal and those where contamination remediation has been undertaken will be filled with waste rock and covered with growth medium. The depth of growth medium placed and the vegetation established will be dependent on the outcomes of VMP. Sufficient growth medium will be placed to allow for the successful establishment of vegetation. Cover and growth medium placement will be undertaken to promote proper runoff drainage and prevent the formation of low points where water may pond.

Closure actions for the buildings will include the following:

- The water and power reticulation and associated infrastructure will be retained until such time as water and power are no longer needed on site. Once no longer required, all power and water services to be disconnected and certified as safe prior to commencement of any demolition works.
- All remaining inert equipment and demolition debris will be placed in the base of the nearest open pit.
- Salvageable equipment will be removed and transported offsite prior to the commencement of demolition.
- All fittings, fixtures and equipment within buildings will be dismantled and removed to designated temporary salvage yards until removed as scrap or disposed as waste.
- All tanks, pipes and sumps containing hydrocarbons to be flushed or emptied prior to removal to ensure no hydrocarbon/chemical residues remain.
- All above ground electrical, water and other service infrastructure and equipment to be removed and placed designated temporary salvage yards until removed as scrap or disposed as waste.
- All pond liners to be removed for disposal in designated landfills.
- Electrical, water and other services that are more than 400 Mogalakwena Mine below ground surface will remain.
- All pipes and structures deeper than 400 mm need to be sealed to prevent possible ingress and ponding of water.
- Concrete slabs and footings will be removed to a depth of 500 mm below ground surface. This concrete (and metal) will be broken up and disposed of in the pit.
- All concrete below 500 mm depth will remain underground with the invert of all structures broken/sealed to prevent possible ingress and ponding of water.
- Soils beneath the plant, storage tanks and chemical storage areas will be sampled. Any contaminated soils found will be removed for disposal as per the mines Waste Management Plan.
- All subsurface cavities such as reinforced concrete tunnels under stockpiles and septic tanks will be backfilled.
- All excavations resulting from demolition of plant, buildings, roads, conveyor platforms, etc. and earth structures will be left in a safe manner.
- All telecommunication towers and dishes to be dismantled and removed.

30.4.4 Roads, laydown and parking areas

Mine roads that are not needed for closure and post closure uses at the site (e.g. security and monitoring) will be closed. Where possible the larger roads that are retained will be resized for post closure use by regrading and ripping to a width that is appropriate for anticipated post closure traffic.

Closure actions for the roads, laydown and parking areas will include the following:

- Removal of all signage, fencing, shade structures, traffic barriers, etc.
- All 'hard top' surfaces to be ripped and bitumen removed along with any culverts and concrete structures.

- Where possible preserve existing vegetation – native trees and plants that may currently be incorporated in parking areas.
- All concrete lined drainage channels and sumps to be broken up and removed.
- All excavations or vertical walls resulting from removal of foundations or structures are to have sides slopes battered to 2H:1V and are to be made safe pending final reclamation work.
- All potentially contaminated soils are to be identified and demarcated for later remediation.
- All haul routes that have been treated with dust suppression water need to be sampled to determine whether they need to be treated as “sealed” roads with the upper surface ripped and removed and disposed of as per the mines Waste Management Plan.

30.4.5 Buffer dam

The dam will ultimately be reclaimed and the area shaped to form a stable landform congruent with the surrounding landscape. The dam will, however, be retained during the majority of the closure period to provide water for closure activities as well as to capture any residual seepage and contact water which may be generated on the site.

Closure actions for the dam will include:

- Demolish all concrete structures.
- Remove any silt that accumulated in the dam and classify in line with regulations. Silt to be managed as per the mines Waste Management Plan.
- Remove liners and following waste classification testing, dispose appropriately. If the liner is not identified as a potential future contamination risk, the liner will be buried in situ. Prior to burial, the liner will be punctured or cut so that that natural geohydrological conditions are minimally impacted at closure.
- Backfill excavations with material removed during construction which will be located adjacent to the dams.
- Profile footprint to be free draining with no low points to accumulate water.

30.4.6 Waste management

Waste will be classified as necessary and then depending on the classification handled according to the mines Waste Management Plan. Likely activities are:

- Designated temporary salvage yards will be developed for the storage of mobile equipment, structural steel and mechanical equipment or other equipment with a potential resale or scrap value. The location of these yards will be dictated by existing permitted land clearance. Material will be stored in these salvage yards until opportunities for resale/reuse are exhausted. Residual material will be disposed of according to the Waste Management Plan;
- It may be necessary for security reasons to fence temporary salvage yards particularly where these are located close to public roads.
- Once material is removed from the yards (either through sale or disposal), temporary infrastructure will be demolished, compaction loosed by ripping and the footprint revegetated as per the VMP.

30.4.7 Storm water management

Prior to closure, a water management plan will be prepared to identify which structures are required at closure and which can be decommissioned. Ditches decommissioned will be closed by backfilling the excavations with the material removed and placed adjacent to the structures. Bunds not required will be flattened by redistributing the material across the footprint used to borrow the material for construction.

30.4.8 Fencing and walling

Walls will be demolished by breaking the concrete panels or bricks and mortar and removing support posts from the ground. Rubble and scrap metal will be recycled and where there are not alternatives

be disposed to landfill. Excavations for support posts will be backfilled with growth medium. The footprints of the demolished walls will then be rehabilitated as per the footprints for other infrastructure being demolished.

Security fencing around individual infrastructure will be removed once fences are redundant. Support posts will be removed by excavating to base level if necessary. Excavations will be backfilled with growth medium and vegetation established.

30.4.9 Vegetation and wildlife

Successful revegetation will help control erosion of soil resources, maintain soil productivity and reduce sediment loading in streams. As part of biodiversity management, revegetation will enhance the resulting biodiversity opportunities by utilizing non-invasive plants that fit the criteria of the habitat (e.g. soils, water availability, slope and other appropriate environmental factors). Invasive species will be avoided, and the area will be managed to control the spread of these species.

The slopes at the mine residue facilities are likely to be susceptible to erosion, even after reshaping the facilities to a lower gradient. To counter the effects of erosion, naturally occurring grassland species will be planted on the slopes and tops of the facilities. At this time, these species will provide soil holding capacity and reduce runoff velocity. The composition of the natural species and their planting strategy will be determined through revegetation trials conducted concurrently with mining.

The flatter areas, such as those not on mine residue facilities, will be revegetated with the objective of creating a sustainable ecosystem similar to an analogue reference plots.

No specific measures will be taken to reintroduce wildlife as the different animals still occupying the remaining habitat are expected to expand their territories into the Mogalakwena Mine area.

30.5 Future land use after decommissioning

Post closure land use (PCLU) is determined in consultation with stakeholders so that the PCLU meets the requirements of the stakeholders, within the context of what can reasonably be achieved on site. This activity is undertaken for the whole mine lease area affected by mining activities and integrates stakeholder requirements with risk mitigation. As specific consultation regarding PCLU has not been undertaken at this stage of the closure process for the Expansion Project nor has it been undertaken for the large mining rights area, for purposes of current planning and liability costing for the Expansion Project, various assumptions relating to closure have been developed.

Given the extent of the disturbance within the lease area, with the majority of the disturbance remaining post closure in the form of mine residues (tailings and waste rock) and various open pits, post closure land use is unlikely to contain alternatives that could be utilised sustainably by the community. However, should infrastructure be demolished, there are opportunities that the footprints could be utilised for sustainable post closure uses.

Based on the limitations presented by the permanence of the disturbances associated with the mining activities, the overall post closure land use for the mine has been determined to be:

- Landforms, that sustain indigenous vegetation which limits water and wind erosion.
- Mosaic of nodes where existing infrastructure is utilised by stakeholders for a variety of post closure activities surrounded by areas rehabilitated back to a land capability possible of supporting indigenous vegetation as well as land capable of supporting the various community initiatives in which the mine is involved.

The land capability developed on the footprints where covers are placed, and vegetation established will be a land capability defined as grazing by the Chamber of Mines¹, with these covers expected to support landforms that support indigenous vegetation. Flat areas where decommissioning activities are undertaken will be converted to a mosaic of land where the intended use is industrial and agricultural.

As the nature of the disturbance associated with the Expansion Project is similar to that which already exists for the operational infrastructure, the PCLU for the Expansion Project is aligned with the above. It is likely that on closure of the expansion infrastructure, the residues will present few sustainable land use options to the communities, however, infrastructure that remains, as well as the footprints that remain, after decommissioning may have associated sustainable post closure land uses.

As the demographics of the areas surrounding the mine may change at closure as communities potentially move in seek of other livelihoods, pressures on the land may reduce. This may however, be countered by population growth between now and when the mine closes. It is likely that for the next 20 to 30 years, land use will be associated with mining and will remain so until closure. After closure, the mine is likely to enter into a period of care and maintenance on the rehabilitated areas, further limiting opportunities for community use. However, once sufficient data has been obtained to indicate that the mine has met its relinquishment criteria, use of rehabilitated areas may commence.

31 Mechanisms for Monitoring Compliance

Internal and external environmental monitoring is undertaken on an ongoing basis at Mogalakwena Mine as required in the relevant authorisations, permits and licences. Details associated with the compliance monitoring is provided in the sections below.

31.1 Monitoring of impact management actions

A performance assessment against this EIA/EMPr, which includes all the previously approved EMPr undertaken for Mogalakwena Mine, will be undertaken every second year to assess the compliance against:

- Impact management measures for the:
 - the Expansion Project infrastructure and activities as detailed in Section 18; and
 - previously approved EMPrs detailed in Appendix 9.

31.2 Responsible persons for implementation of management actions

The responsible persons for the implementation of the management measures, as listed in 31.1, and the monitoring of environmental compliance at Mogalakwena Mine is provided in Table 2-5.

31.3 Time period for implementation of management actions

The infrastructure and activities associated with the Expansion Project are aligned with the planned LoM of Mogalakwena Mine. The time period for the implementation of the management actions associated with the proposed Expansion Project will be aligned with the different phase of the expansion activities as detailed in Section 18.

¹ Now known as Minerals Council South Africa

31.4 Specific environmental monitoring requirements

This section details the existing and proposed specific environmental monitoring requirements for Mogalakwena Mine and includes the monitoring of the following:

- Surface and ground water;
- Biomonitoring;
- Air quality;
- Noise;
- Soils;
- Post Rehabilitation monitoring.

31.4.1 Surface and groundwater

MM has an extensive monitoring program which includes all water and waste management facilities and has been aligned with BPG G3 (DWAF, 2006), as well as the objectives set out in the Anglo Water Management Guideline (GTG 21). According to the Anglo guideline this program must include as a minimum:

- responsibility for the monitoring program;
- locations of routine samples to be taken and purpose;
- required sampling and preservation guidelines (surface / groundwater);
- analytical parameters required per sample;
- frequency of sampling;
- sample quality/custody controls; and
- data management, and reporting.

Sampling of surface water and groundwater is done by Mogalakwena Mine staff and external appointed companies.

Water resources are currently monitored in the Mohlosane and Groot Sandsloot (Pholotsi) River, upstream and downstream of mining activities and on Vaalkop Dam. Samples are submitted to an approved laboratory for analyses and check samples are sent to the SABS laboratories to verify results. Surface, process and groundwater are monitored monthly, and rest water levels are measured biannually.

The sampling protocol is reviewed every two years and all parties involved in the monitoring are informed of updates (Groundwater and Surface water Monitoring Procedures MS-SHE-ENV-PRO-0009 and MS-SHE-ENV-PRO-0004, respectively).

MM's WULs identifies the groundwater and surface water monitoring points required to be sampled. The monitoring program has expanded considerably since the issuing of these WULs. The intention of the WULs is to ensure protection of the resource and downstream users. The current monitoring program in place is designed to:

- monitor process water, discharges, effluents and receiving water to identify impacts caused by Mogalakwena Mine operations;
- measure compliance to WUL;
- determine the extent of groundwater pollution plumes;
- determine the fitness for use of water for potential downstream/down gradient users;
- inform Mogalakwena Mine's water management strategy, which is reliant on the implementation of a well-designed and maintained monitoring program and database.

Quantity monitoring includes water consumption and metering of the various water and waste streams on the mine. The data is reflected in the mine water balance.

A WUL is being applied for as part of the integrated environmental authorisation process for the Expansion Project. As agreed with DWS at the pre- application meeting, the water uses from the 2007 and 2017 WULs be consolidated and included in the new WULA for the Mogalakwena Mine expansion project. Refer to Section 29.2.4 and Appendix 17: for further details relating to the new water uses associated with the proposed Expansion Project.

Surface and groundwater monitoring at the mine will be undertaken in line with the requirements specified in the WUL, which will include additional monitoring requirements associated with the Expansion Project.

31.4.2 Biomonitoring

Stream assessment scoring system (SASS5) aquatic biomonitoring is not undertaken at Mogalakwena Mine due to the intermittent flows experienced in the rivers only during rainfall events and the main river flow being subsurface. Mogalakwena Mine requested that the biomonitoring conditions within the 2007 WUL be removed and this was granted by the Department in 2010. As a result, biomonitoring is not conducted regularly at Mogalakwena Mine, however, habitat assessments of the rivers have been undertaken during specialist field investigations.

31.4.3 Air quality monitoring

Air quality at Mogalakwena Mine is monitored through 32 Dust Fallout (DFO) monitoring and three PM₁₀ monitoring points situated across the mining area. Currently the DFO sampling stations consist of 18 residential area DFO units and 13 non – residential area DFO units. The location of the monitoring stations is listed in Table 14-13 and shown in Figure 14-11.

31.4.4 Noise monitoring

Noise monitoring was undertaken as part of the noise impact assessment. The location of the monitoring points is listed in Table 14-5 and shown in Figure 14-6.

The Noise Impact Management Plan for the proposed mine expansion project is shown in Table 31-1.

Table 31-1: Noise monitoring plan for the mine expansion project

Action	Description	Frequency
Management objective	To ensure that the legislated noise levels will be adhered to at all times.	Quarterly for a period of a year after which the frequency can change to an annual basis.
Monitoring objective – Construction phase	Measure the environmental noise levels during the construction phase of the project to ensure compliance to the recommended noise levels.	Quarterly for a period of a year after which the frequency can change to an annual basis.
Monitoring objective – Operational phase	Measure the environmental noise levels during the operational phase of the project to ensure compliance to the recommended noise levels.	Quarterly for a period of a year after which the frequency can change to an annual basis.
Monitoring technology	The environmental noise monitoring must take place with a calibrated Class 1 noise monitoring equipment.	Quarterly for a period of a year after which the frequency can change to an annual basis.
Specify how the collected information will be used	The data must be collated and discussed on a monthly basis during the construction phase and on a monthly basis during the operational phase for the first two years thereafter on an annual basis.	Quarterly for a period of a year after which the frequency can change to an annual basis.

Action	Description	Frequency
Spatial boundaries	At the boundaries of the identified abutting residential areas as well as at the boundaries of the different mining areas.	Quarterly for a period of a year after which the frequency can change to an annual basis.
Define how the data will be analysed and interpreted and how it should be presented in monitoring reports	Reports must be compiled for each monitoring cycle and the results must be compared to the previous set of results to determine if there was a shift in the prevailing ambient noise.	Quarterly for a period of a year after which the frequency can change to an annual basis.
Accuracy and precision of the data	he noise surveys will have to be conducted in terms of the recommendations of the Noise Control Regulations and SANS 10103 of 2008.	Calibrated equipment must be used at all times and at noise monitoring points.

31.4.5 Soils

During the rehabilitation of the impacted areas soil quality monitoring should be carried out to accurately determine the fertiliser requirements that will be needed. Additional soil sampling should also be carried out on the re-instated soils as required until the levels of nutrients are at the required levels for sustainable growth.

Once the desired nutritional status has been achieved, it is recommended that the interval between sampling is increased. An annual environmental audit should be undertaken as part of the monitoring strategy.

If growth problems develop, ad hoc, sampling should be carried out to determine the problem.

Monitoring should always be carried out at the same time of the year and at least six weeks after the last application of fertilizer

Soils should be sampled and analysed for at least the following parameters:

- pH (H₂O)
- Phosphorus (Bray I)
- Electrical conductivity
- Calcium mg/kg
- Cation exchange capacity
- Sodium mg/kg;
- Magnesium mg/kg;
- Potassium mg/kg
- Zinc mg/kg;
- Clay Organic matter content (C %)

The following management and maintenance is also recommended:

- During rehabilitation and the establishment of the vegetative cover the sites must be fenced, and all animals kept off the area until the vegetation is self-sustaining;
- Newly seeded/planted areas must be protected against compaction and erosion ;
- Traffic should be limited were possible while the vegetation is establishing itself;
- Plants should be watered and the sites weeded as required on a regular and managed basis were possible and practical;
- Check for pests and diseases at least once every two weeks soon after planting, and treat if necessary;
- Replace unhealthy or dead plant material;

- Planted (Hydro seeded and grassed) areas should be fertilised soon after germination, and
- Repair any damage caused by erosion

31.4.6 Closure and post closure period

The purpose of implementing closure actions detailed in Section 30.4, is to reduce closure risk to an acceptable residual risk timeously. Based on the work required, AAP has determined that closure will be implemented over a five-year period, based on the premise that significant remedial work will have been undertaken on the WRDs and decommissioned infrastructure during the remaining Life of Mine.

Once the closure activities have been completed, the operation will enter a ten-year post closure period. During this time, erosion repair and vegetation establishment will be undertaken, if monitoring activities indicate that it is required. This is within the context that the areas under consideration in this plan are flat and are not likely to be subject to significant erosion.

A post closure period of ten years is considered by AAP to be sufficient time as biological process can be demonstrated to be occurring, leading to vegetation covers being stable and sustainable, within this timeframe. Furthermore, sufficient data can be collected to demonstrate that the achievement of the specific relinquishment criteria comply with the trend for the biophysical category under consideration.

31.4.7 Continuous maintenance

The mine undertakes continuous maintenance on infrastructure that has the potential to affect the environment. This infrastructure includes pipelines, roads, conveyors and infrastructure traversing watercourses. The maintenance is a result of planned inspections on these facilities where specific requirements for maintenance on the above infrastructure is required and is conducted in line with a maintenance schedule.

31.5 Frequency of the submission of the performance assessment report

A formal audit of the performance assessment of the EMPr will take place every 2 years.

31.6 Environmental awareness plan

The proposed project will utilise the existing Mogalakwena Mine SHE Department Environment – Competence, Training and Awareness procedure attached in Appendix 20:.

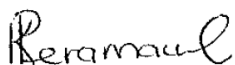
31.7 Specific information required by the competent authority

The DMR approved the Final Scoping Report and requested that the items detailed in Table 1-2 be addressed in the EIA/EMPr. Responses to the information request is also included in this table. Please refer to the DMR acceptance letter in Appendix 4

31.8 Undertaking.

Declaration of Independence by the Environmental Assessment Practitioner

- I act as independent environmental practitioner in this application;
- I will perform work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conduction environmental impact assessments, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I will take into account, to the extent possible, the matters listed in regulation 8 of the Regulations when preparing the application and any report relating to the application;
- I have not, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing – any decision to be undertaken with respect to the application by the competent authority; and – the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
- I will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the competent authority in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the competent authority may be attached to the report without further amendment to the report;
- I will keep a register of all interested and affected parties that participated in a public participation process;
- I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not;
- All the particulars furnished by me in this form are true and correct;
- Will perform all other obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.



Signature of the Environmental Assessment Practitioner

Alta van Dyk Environmental Consultants cc

06 June 2022

Date