



mineral resources

Department:  
Mineral Resources  
REPUBLIC OF SOUTH AFRICA

# Basic Assessment Report And Closure Environmental Management Programme

Application for Environmental Authorisation in Support  
of the Proposed Decommissioning, Rehabilitation and  
Closure Activities at the Rand Uranium Cooke No. 1, 2  
and 3 Shaft Operations

## PART B: CLOSURE ENVIRONMENTAL MANAGEMENT PROGRAMME

*SUBMITTED FOR ENVIRONMENTAL AUTHORISATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998) (NEMA) AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008 (ACT NO. 59 OF 2008) (NEM:WA) IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (ACT NO. 28 OF 2002) (MPRDA) (AS AMENDED).*




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DIGBY WELLS  
ENVIRONMENTAL

This document has been prepared by Digby Wells Environmental.

<b>Report Type:</b>	Part B: Basic Assessment Report and Closure Environmental Management Programme
<b>Project Name:</b>	Closure of the Cooke No. 1, 2 and 3 Shaft Operations
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## IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002 as amended) (MPRDA), the Minister must grant a prospecting or mining right if among others the mining “will not result in unacceptable pollution, ecological degradation or damage to the environment”.

Unless an Environmental Authorisation (EA) can be granted following the evaluation of an Environmental Impact Assessment (EIA) process and an Environmental Management Programme (EMPr) report in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

In terms of section 16(3)(b) of the EIA Regulations, 2014 (GN R982 of 4 December 2014, as amended) (the “*EIA Regulations, 2014*”), any report submitted as part of an application must be prepared in a format that may be determined by the Competent Authority and in terms of section 17(1)(c), the competent Authority must check whether the application has taken into account any minimum requirements applicable or instructions or guidance provided by the competent authority to the submission of applications.

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

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

## OBJECTIVE OF THE BASIC ASSESSMENT PROCESS

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

- Determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;
- Identify the alternatives considered, including the activity, location, and technology alternatives;
- Describe the need and desirability of the proposed alternatives;
- Through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine:
  - The nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
  - The degree to which these impacts:
    - Can be reversed;
    - May cause irreplaceable loss of resources; and
    - Can be managed, avoided or mitigated.
- Through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to:
  - Identify and motivate a preferred site, activity and technology alternative;
  - Identify suitable measures to manage, avoid or mitigate identified impacts; and
  - Identify residual risks that need to be managed and monitored.

## EXECUTIVE SUMMARY

### Introduction

The Cooke Operations are owned by Rand Uranium (Pty) Limited (Rand Uranium) which is a wholly owned subsidiary of Sibanye Gold Limited (Sibanye). The operations are located in the West Rand District Municipality (WRDM) and operate under two converted Mining Rights, namely (GP)30/5/1/2/2(07)MR (hereinafter “07 MR”) and (GP)30/5/1/2/5 (173)MR (hereinafter “173 MR”), associated with its underground and surface operations, respectively.

Broadly, the Cooke Underground Operations comprise three mine shaft complexes, namely Cooke No. 1, 2 and 3 Shafts (07 MR) for which Sibanye is seeking permanent closure; while the Cooke Surface Operations entail surface reclamation of historic gold Tailings Storage Facilities (TSFs). Gold recovery from reclaimed tailings material is undertaken through the Cooke Gold Plant (173 MR).

Sibanye is proposing to undertake various decommissioning, rehabilitation and closure activities across both Mining Right Areas which are subject to environmental approval. The environmental regulatory process comprises the following applications:

- An Application for Environmental Authorisation (EA) for triggered Listed Activities in terms of the Environmental Impact Assessment (EIA) Regulations, 2014 (GN R982 of 4 December 2014, as amended) (the “*EIA Regulations, 2014*”), specifically Listing Notice 1 (GN R983 of 4 December 2014, as amended) promulgated under the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA);
- A Heritage Resources Management (HRM) Process to comply with Section 38 of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) in support of the EA Application;
- An application for an Integrated Water Use Licence (IWUL) for identified Water Uses in terms of Section 21 of the National Water Act, 1998 (Act No. 36 of 1998) (NWA) and associated application in terms of the Regulations on Use of Water for Mining and Related Activities aimed at the Protection of Water Resources (GN R704 of 12 February 2010); and
- A Closure Application in terms of Section 43(3) of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA) and Regulation 57 of the MPRDA Regulations (GN R527 of 23 April 2004) (the “*MPRDA Regulations, 2004*”) for the underground MR (07 MR).

The Cooke Surface Operations’ activities will be maintained while permanent closure is being sought for the Cooke Underground Operations. which will be maintained.

Digby Wells and Associates (South Africa) (Pty) Limited (trading as Digby Wells Environmental, hereinafter Digby Wells) was appointed to undertake these environmental regulatory processes.

This report constitutes the draft Basic Assessment Report (BAR) and Closure Environmental Management Programme (CEMP) in support of the EA Application<sup>1</sup>. This report is being submitted to Interested and Affected Parties (I&APs) for a public commenting period between **16 October 2020 and 16 November 2020**. Following this commenting period, the report will be updated to include all comments received and subsequently submitted to the Department of Mineral Resources and Energy (DMRE) for final appraisal of the EA Application.

*Note: The Closure Process for the Cooke Underground Operations is being executed in a phased approach. This Basic Assessment Process relates to Phase Two, encompassing closure implementation activities. Phase One (i.e. Regulation 37 EMP Amendment Process) relates to closure planning activities and was submitted to the DMRE for final appraisal on 15 September 2020.*

### Project Applicant

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### Environmental Consultants

<b>Company name:</b>	Digby Wells and Associates (South Africa) (Pty) Ltd, t/a Digby Wells Environmental
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<sup>1</sup> The BAR and CEMP has been split into Part A and Part B respectively. This document constitutes Part B.

## Approach and Methodology for the Public Participation Process

A Public Participation Process (PPP) was undertaken during Phase One of the Cooke Underground Closure Process (closure planning activities), from January to September 2020. It is important that stakeholders that may be affected by the project are given an opportunity to identify concerns and to ensure that local knowledge, needs and values are understood and taken into consideration as part of the impact assessment process.

The stakeholders' comments from Phase One have been duly considered in this BAR and responses have been refined accordingly as more information became available (refer to the appended Comment and Response Report (CRR)). This draft BAR has been submitted to I&APs for a public 30-day review and commenting period between **16 October 2020 and 16 November 2020**.

Due to the COVID-19 Pandemic and associated restrictions, no hard copies of this draft BAR were made available at public places. The report has been made available on various online platforms, namely:

- Digby Wells website ([www.digbywells.com](http://www.digbywells.com)) under Public Documents;
- Ulwazi Platform Zero Data Portal (<https://ulwazi.datafree.co/>); and
- Ulwazi Platform USSD messaging service (\*134\*20042#).

Presentations detailing the key outcomes of the investigations and resulting mitigation and management measures have been made available on the abovementioned online platforms. During this public commenting period, the need for focus group meetings will be determined on a case-by-case basis (either face-to-face for a limited number persons or online meetings). Requests for hard copies will also be fulfilled should any of the abovementioned platforms pose a concern to the I&APs. It should be noted that community training sessions on the use of the Ulwazi and USSD platforms were hosted during the Phase One PPP. The DMRE and DWS raised no objections to the way forward presented for the PPP.

## Need and Desirability of the Project

Underground mining at Cooke No. 1, 2 and 3 Shafts ceased in May 2018. Sibanye has maintained the underground workings while investigating feasible plans to continue mining or sell the operations. No plans were found to be feasible, and as such, Sibanye is now seeking a permanent sustainable closure solution. This includes various decommissioning and final rehabilitation activities at these shaft complexes and associated infrastructure, as well as closure activities for the underground workings.

The Cooke Surface Operations are ongoing. In line with the Rehabilitation Plan, water resources (including wetlands and portions of the Wonderfontein spruit) which have been contaminated by historic mining activities and/or the current operations are to be rehabilitated. Sibanye intends to undertake this as concurrent rehabilitation activities while maintaining surface operation activities.



To this end, decommissioning, rehabilitation and closure activities are proposed to be carried out across both Mining Right Areas. This is aimed to result in the permanent sustainable closure of the Cooke Underground Operations, while reducing longer term environmental risks and liabilities for the ongoing Cooke Surface Operations.

## **Project Overview**

The proposed decommissioning, rehabilitation and closure activities include:

- Removal and decontamination of underground infrastructure containing hydrocarbons and other contaminants from the underground workings;
- Refurbishment of plugs between Cooke No. 3 Shaft and Cooke No. 4 Shaft (Ezulwini Gold Mine), as well as between Cooke No. 1 Shaft and Doornkop Mine (Harmony Gold Mine);
- Potential capping of the shaft barrel below the dolomitic aquifer, although it is noted that the Groundwater Report has found this to not be a requirement and the shafts will be capped on surface to prevent access to the shafts;
- Rewatering of underground workings;
- Decommissioning and removal of surface infrastructure at the shaft complexes (incl. water contaminant facilities and buried pipelines);
- Rehabilitation of all associated disturbed surfaces (incl. shaping landscape, soil amelioration and re-vegetating); and
- Rehabilitation of various mine affected wetlands as appropriate based on the specialist investigations across the Cooke Surface- and Underground Operations (incl. removal of impacted material which has accumulated in the water resources and/ or alien plant species, ripping soils and possible re-vegetation of indigenous plant species).

## **Purpose of this Report**

The purpose of the BAR is to describe the proposed activities and identify potential environmental and socio-economic impacts (both positive and negative) that could arise from the execution of these activities. To achieve this, various environmental and socio-economic specialist investigations were carried out. From this, a CEMPr was developed to provide specific mitigation and management measures to avoid or minimise the significance of adverse impacts as far as possible.

## **Impact Assessment Summary**

The majority of adverse impacts associated with the implementation of the proposed decommissioning and rehabilitation activities are expected to be of Minor or Negligible Negative significance. Possible impacts include sedimentation of nearby watercourses and wetlands as a result of erosion (water and wind) from bare surfaces following the removal of



infrastructure, as well as soil and water resource contamination from hydrocarbon spillages/leakages. This would consequently lead to reduced ecological integrity of the freshwater ecosystems which, as established in the Baseline Section, are already adversely impacted. Nuisance impacts in terms of increased noise and dust fallout may also be experienced by nearby receptors during the execution of these activities.

On the other hand, the proposed rehabilitation activities would entail the removal of existing contamination sources and alien invasive plant species from the landscape and wetlands, as well as profiling of disturbed areas and re-establishment of natural vegetation. If correctly implemented, positive impacts will be realised to terrestrial biodiversity and freshwater ecosystems and lead to the establishment of a sustainable post-mining land use for the Cooke Shaft Complexes, which will in-turn have socio-economic benefits.

The key legacy issue associated with gold mining in the area is Acid Mine Drainage (AMD) formation. A comprehensive hydrogeological numerical model was prepared to predict and quantify possible impacts to water resources as a result of the closure and rewatering of the Cooke No. 1, 2 and 3 Shafts. The model found that water in the shafts is not expected to decant to surface and therefore, the shafts are not regarded as contamination sources. Furthermore, geochemical modelling indicates that water in the shafts is expected to be of an acceptable standard. Therefore, even in the unlikely event that decant or contamination of the dolomitic aquifers occurs, water from the shaft is not expected to significantly contribute to deteriorating water quality to the surrounding water resources.

In the long-term, as the affected dolomite aquifers recover, water flow to the Wonderfonteinspruit is expected to occur as per pre-mining conditions. This water is expected to be of an acceptable standard for various downstream water users and associated freshwater ecosystems, and represent an improved quality from the current water quality discharged into the Wonderfonteinspruit. As such, a long term benefit rated to be of Moderate Positive significance is anticipated. It is however noted that the dormant Cooke TSF, located north of the shaft complexes, was deemed a potential source of contamination to the groundwater environment. The contamination plume is not expected to migrate to the nearest receptors and as such, deemed an impact of Minor Negative significance.

From a socio-economic perspective, positive impacts including job opportunities for the execution of decommissioning and rehabilitation activities; as well as the sale of salvageable items to local supply chain will be realised. In terms of potential negative socio-economic impacts, health, safety and security risks associated with illegal mining which is prevalent in the area could occur; as well as community unrest due to a perceived lack economic opportunities and unfulfilled promises is possible. Furthermore, the permanent closure of the Cooke Underground Operations has and will inevitably result in adverse socio-economic implications due to the loss in employment opportunities. As a result of the cessation of underground mining in 2018, significant retrenchments, loss of contracts and other induced benefits associated with the Cooke Underground Operations have occurred. As no feasible options to continue underground mining could be identified, these adverse effects will be

permanent. The operations are located in an area where there is a prevalence of illegal mining activity. The rewatering, decommissioning and removal of mining infrastructure and any associated viable surface sources will remove sources for illegal mining in the immediate area of Cooke but this in turn may lead to illegal miners targeting neighbouring mines, especially those abandoned and derelict as is already the case. This in turn presents community health, safety and security risks. This is deemed an impact of Major Negative significance. A Social Closure Plan (SCP) Process has been commissioned to appropriately and meaningfully engage with stakeholders to address the potential direct and indirect socio-economic impacts associated with closure.

## **Conclusions and Recommendations**

The findings of the Impact Assessment show that the majority of adverse impacts are expected to be of Minor or Negligible significance. With the implementation of the proposed mitigation measures, it is expected that the significance of all identified impacts can be reduced. This will result in the majority of adverse impacts for the implementation of decommissioning and rehabilitation activities being of Negligible significance. Ultimately, the activities are aimed at rehabilitating mine affected areas and water resources which, if successfully executed, should restore/ improve the environmental biophysical characteristics of the area and contribute to reducing the existing adverse cumulative impacts caused by current and historic mining activities in the West Rand.

The following key recommendations are made which should be considered as conditions for the EA:

- The mitigation/ enhancement measures contained in the CEMPr must be adhered to for the overall positive impacts of the project to be realised;
- An Environmental Control Officer must be appointed for and be present during the decommissioning and rehabilitation activities;
- An IWUL must be obtained prior to undertaking the proposed rehabilitation activities in, or in proximity to, water resources;
- As per the Geochemical Assessment, though a low risk in terms of leaching chemicals is expected, impacted areas outside of watercourses should be removed and disposed of as per the current approved disposal measures into the pits. Areas associated with the watercourses found to be contaminated should be further investigated for rehabilitation requirements once activities impacting these areas have ceased (i.e. discharge and deposition), while it is not recommended to disturb sediments with a low risk of leaching in functioning flowing river systems such as the Wonderfontein spruit as this is more likely to lead to further impacts and degradation;
- The Hydrogeological Numerical Model must continue to be updated periodically as more information becomes available during closure implementation to refine the model

predictions and additional monitoring boreholes should be drilled to assist in the monitoring and refinement of the modelling;

- The Decommissioning, Rehabilitation and Mine Closure Plan (2019) developed in terms of the Financial Provisioning Regulations, 2015 (GN R1147 of 20 November 2015, as amended) (the “*Financial Provisioning Regulations, 2015*”) must be updated on an annual basis, considering the progression of rehabilitation and closure activities, as well as the status of impact predictions;
- The planned SCP Process must be implemented to meaningfully engage with stakeholders and develop a practical plan to execute social closure;
- Environmental monitoring as prescribed under the CEMPr must continue throughout the implementation of proposed activities;
- Post-closure monitoring must be undertaken in line with the Decommissioning, Rehabilitation and Mine Closure Plan once the requirements are understood and detailed; and
- Specific rehabilitation plans must be developed for the targeted affected wetlands across both Mining Right Areas and be informed by the ecological state of these system as established in this BAR.

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## ACRONYMS AND ABBREVIATIONS

Abbreviation / Acronym	Description
07 MR	Refers to the approved Mining Right Area for the Cooke Underground Operations with the reference number: (GP) 30/5/1/2/2 (07) MR
173 MR	Refers to the approved Mining Right Area for the Cooke Surface Operations with the reference number: (GP) 30/5/1/2/5 (173) MR
AIPs	Alien Invasive Plant Species
AMD	Acid Mine Drainage
BA	Basic Assessment
BAR	Basic Assessment Report
CEMPr	Closure Environmental Management Programme
CFP	Chance Find Produce
Clidet EMPr	EMPr was issued to Clidet No. 726 (Pty) Ltd for the Cooke Operations dated March 2008 (approved July 2009)
Digby Wells	Digby Wells and Associates (South Africa) (Pty) Limited, trading as Digby Wells Environmental
DMRE	Department of Mineral Resources and Energy
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EIA Regulations, 2014	(GN R982 of 4 December 2014, as amended) promulgated under the National Environmental Management Act, 1998 (Act No. 107 of 1998)
EMPr	Environmental Management Programme
Financial Provisioning Regulations, 2015	GN R1147 of 20 November 2015, (as amended) promulgated under the National Environmental Management Act, 1998 (Act No. 107 of 1998)
HRM	Heritage Resources Management
I&APs	Interested and Affected Parties
IWUL	Integrated Water Use Licence
IWULA	Integrated Water Use Licence Application
MPRDA	Mineral and Petroleum and Resources Development Act, 2002 (Act No. 28 of 2002)

<b>Abbreviation / Acronym</b>	<b>Description</b>
MPRDA Regulations, 2004	GN R527 of 23 April 2004 promulgated under the Mineral and Petroleum and Resources Development Act, 2002 (Act No. 28 of 2002)
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEM:WA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NWA	National Water Act, 1998 (Act No. 36 of 1998)
Rand Uranium	Rand Uranium (Pty) Limited holds the Mining Rights for the Cooke Operations. The Company is a wholly owned subsidiary of Sibanye Gold Limited.
RWD	Return Water Dam
SCP	Social Closure Plan
Sibanye	Sibanye Gold Limited, a subsidiary of Sibanye-Stillwater Limited
TCTA	Trans Caledon Tunnel Authority
TSF	Tailings Storage Facility



## 1 Introduction

Digby Wells and Associates (South Africa) (Pty) Limited (trading as Digby Wells Environmental, hereinafter Digby Wells) was appointed by Sibanye Gold Limited (a subsidiary of Sibanye-Stillwater Limited, hereinafter Sibanye) to undertake an environmental regulatory process associated with proposed decommissioning, rehabilitation and closure activities at the Cooke No. 1, 2 and 3 Shaft Operations.

The proposed activities trigger Listed Activities in terms of the Environmental Impact Assessment (EIA) Regulations, 2014 (GN R982 of 4 December 2014, as amended) (the “*EIA Regulations, 2014*”) and more specifically, Listing Notice 1 (GN R983 of 4 December 2014, as amended) which were promulgated under the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). This requires that Environmental Authorisation (EA) be obtained through the undertaking of a Basic Assessment (BA) Process. The environmental regulatory processes also include the following:

- A Heritage Resources Management (HRM) Process to comply with Section 38 of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) in support of the EA Application;
- An application for an Integrated Water Use Licence (IWUL) for identified water uses during rehabilitation and closure activities in terms of Section 21 of the National Water Act, 1998 (Act No. 36 of 1998) (NWA) and associated application in terms of the Regulations on Use of Water for Mining and Related Activities aimed at the Protection of Water Resources, 2010 (GN R704 of 12 February 2010); and
- A Closure Application in terms of Section 43(3) of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA) and Regulation 57 of the MPRDA Regulations, 2004 (GN R527 of 23 April 2004) (the “*MPRDA Regulations, 2004*”).

This report constitutes the draft Basic Assessment Report (BAR) and Closure Environmental Management Programme (CEMP<sub>r</sub>) (Part B) in support of the EA Application. This report is being submitted to Interested and Affected Parties (I&APs) for a public commenting period between **16 October 2020 and 16 November 2020**. Following this commenting period, this report will be updated to include all comments received and subsequently submitted to the Department of Mineral Resources and Energy (DMRE) for final appraisal of the EA Application.

Note: The BAR and CEMP<sub>r</sub> has been split into Part A and Part B respectively. This document constitutes Part B.

## 1.1 Project Background and Motivation

The Cooke Operations are owned by Rand Uranium (Pty) Limited (Rand Uranium), which is a wholly owned subsidiary of Sibanye. The operations are situated on the West Rand of the Witwatersrand Basin, namely in the West Rand District Municipality (WRDM), and operate under two converted Mining Rights: (GP)30/5/1/2/2(07)MR (hereinafter “07 MR”) and (GP)30/5/1/2/5(173)MR (hereinafter “173 MR”), associated with its underground and surface operations respectively.

The underground operations (referred to as the “Cooke Underground Operations”) comprise three mine shaft complexes, namely Cooke No. 1, 2 and 3 Shafts. Underground mining at all three complexes ceased in May 2018. Sibanye has maintained the underground workings while investigating feasible plans to continue mining. No plans were found to be feasible and as such, Sibanye is now seeking a permanent sustainable closure solution. This includes various decommissioning and final rehabilitation activities at these shaft complexes as well as closure activities for the underground workings.

The surface operations (referred to as the “Cooke Surface Operations”) are ongoing and entail the reclamation of historic Tailings Storage Facilities (TSFs) for gold recovery. In line with the Rehabilitation Plan, water resources (including wetlands and portions of the Wonderfonteinsspruit) which have been contaminated by historic mining activities and/ or the current operations, are to be rehabilitated. Sibanye intends to undertake this as concurrent rehabilitation activities while maintaining surface operation activities.

To this end, decommissioning, rehabilitation and closure activities are proposed to be carried out across the 07 MR and 173 MR areas. This is aimed to result in the permanent sustainable closure of the Cooke Underground Operations, while reducing longer term environmental risks and liabilities for the ongoing Cooke Surface Operations.

## 1.2 Purpose of this Report

The BAR and this CEMPr have been compiled against the following objectives:

- To provide a clear description of the planned activities which are subject to EA;
- To describe and characterise the biophysical and socio-economic conditions of the project’s footprint;
- To identify and quantify the potential negative and positive environmental and social impacts which may be caused by implementing the proposed activities; and
- To provide a consolidated CEMPr for planned activities across 07 MR and 173 MR with practical mitigation and management measures to address and/or minimise the identified potential impacts to the physical and socio-economic environment.

As the EMPr specifically details with decommissioning, rehabilitation and closure activities, it constitutes and is hereinafter referred to as a Closure EMPr (CEMPr). Latent and/or residual risks associated with the permanent closure of 07 MR that could result in adverse environmental or social impacts have also been considered and used to inform this CEMPr.

### 1.3 Structure of this Report

This report has been compiled based on the required contents of an EMPr as specified under Appendix 4 of the EIA Regulations, 2014. The subsequent chapters have been chronologically aligned to Appendix 4 for ease of reference.

## 2 Administrative Information

### 2.1 Details of the Project Applicant

The Cooke Operations are managed by Rand Uranium, a wholly owned subsidiary of Sibanye. Table 2-2 provides the relevant contact details for the applicant.

**Table 2-1: Applicant Details**

<b>Company name:</b>	Rand Uranium (Pty) Ltd
<b>Responsible person:</b>	Grant Stuart – Senior Vice President
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### 2.2 Details of the Environmental Assessment Practitioner

Digby Wells has been appointed as the independent Environmental Assessment Practitioner (EAP) to undertake the environmental regulatory amendment process. Digby Wells is an independent environmental solutions provider with extensive experience in undertaking environmental regulatory processes within the mining industry. Table 2-2 provides the relevant contact details for the EAP.

**Table 2-2: Contact Details of the EAP**

<b>Company name:</b>	Digby Wells and Associates (South Africa) (Pty) Ltd, t/a Digby Wells Environmental
<b>EAP representative:</b>	Maria Smith – Divisional Manager: Environmental Services

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### 3 Description of the Aspects of the Activity

This application pertained to proposed decommissioning, rehabilitation and closure activities for the Cooke Operations. The activities are aimed at achieving permanent closure for the Cooke Underground Operations while concurrent rehabilitation is proposed for the Cooke Operations.

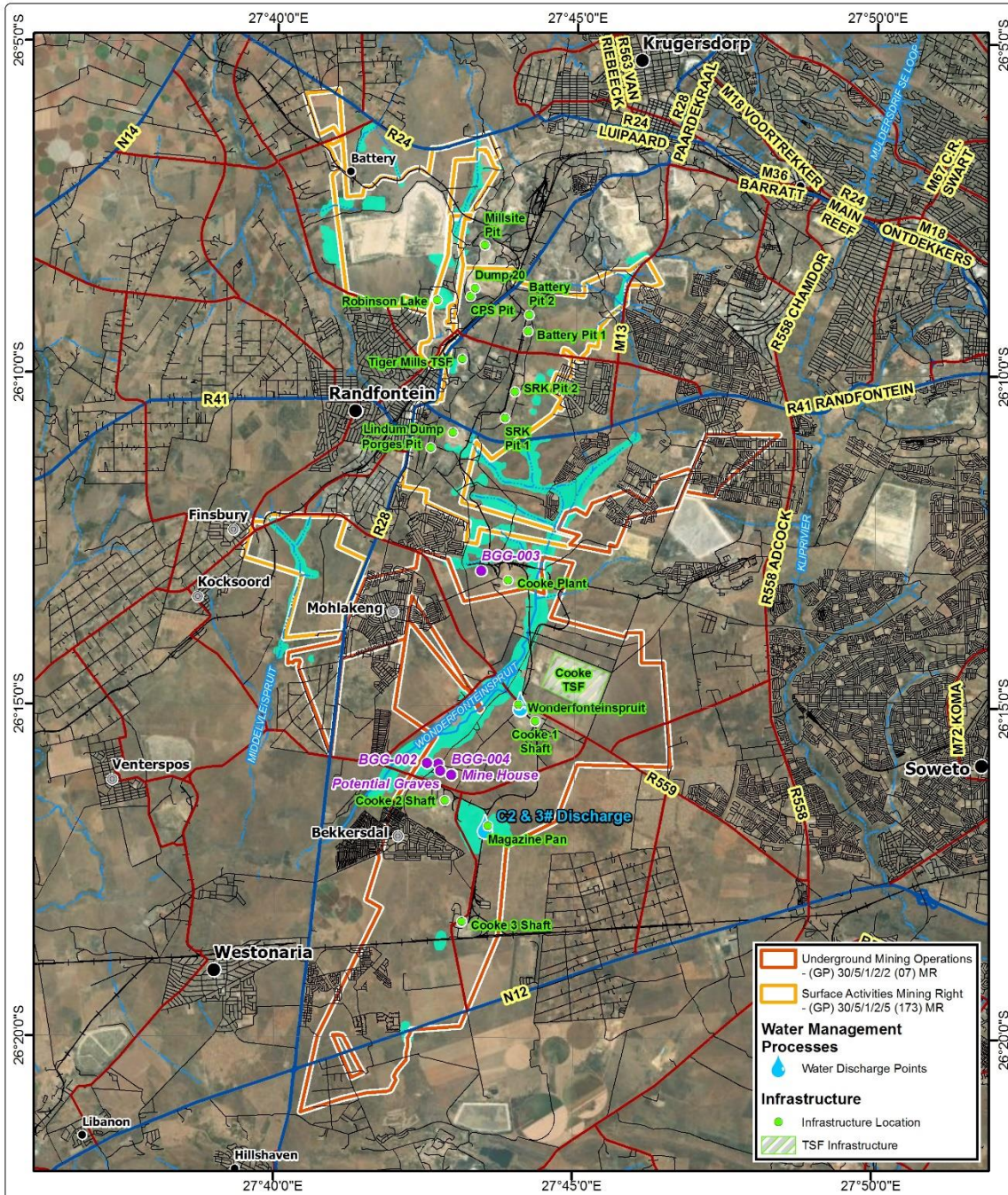
A detailed description of the activities proposed and associated potential impacts are provided in the BAR (Part A). The activities can be summarised as follows:

- Removal and decontamination of underground infrastructure containing hydrocarbons and other contaminants from the underground workings;
- Refurbishment of plugs between Cooke No. 3 Shaft and Cooke No. 4 Shaft (Ezulwini Gold Mine), as well as between Cooke No. 1 Shaft and Doornkop Mine (Harmony Gold Mine);
- Potential capping of the shaft barrel below the dolomitic aquifer, although it is noted that the Groundwater Report has found this to not be a requirement and the shafts will be capped on surface to prevent access to the shafts;
- Rewatering of underground workings;
- Decommissioning and removal of surface infrastructure at the shaft complexes (incl. water contaminant facilities and buried pipelines);
- Rehabilitation of all associated disturbed surfaces (incl. shaping landscape, soil amelioration and re-vegetating); and
- Rehabilitation of various mine affected wetlands as appropriate based on the specialist investigations across the Cooke Surface- and Underground Operations (incl. removal of impacted material which has accumulated in the water resources and/ or alien plant species, ripping soils and possible re-vegetation of indigenous plant species).



### 4 Composite Map

The Composite Map is provided as Plan 1 below.





**Sibanye Cooke Operations: Composite Plan**

<p><b>Legend</b></p> <ul style="list-style-type: none"> <li>● Major Town</li> <li>⊙ Secondary Town</li> <li>⊙ Other Town</li> <li>● Settlement</li> <li>— Arterial/National Route</li> <li>— Main Road</li> <li>— Minor Road</li> <li>— Railway Line</li> <li>— Non-Perennial Stream</li> <li>— Perennial Stream</li> <li>● Heritage Survey Points</li> <li>■ Wetland Delineation</li> </ul>		<p>Projection: Transverse Mercator Central Meridian: 27°E Datum: WGS 1984 Date: 23/09/2020 Ref #: SIB6297_BAR_03_SM</p> 	 <p><b>DIGBY WELLS</b> ENVIRONMENTAL</p> <p>www.digbywells.com</p>
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**Plan 1: Composite Map**

## 5 Description of Impact Management Objectives including Management Statements

### 5.1 Determination of Closure Objectives

Sibanye has concluded the operational phase for the Cooke Underground Operations and will now transition into the decommissioning, rehabilitation and closure phases. The activities subject to this Application are aimed at achieving permanent sustainable closure of 07 MR.

The mine will obtain a Closure Certificate only once it can prove that rehabilitation is satisfactory and that if any residual pollution effects exist they can be adequately managed. Whatever form of rehabilitation is used, a post-closure monitoring programme must be implemented before the mine applies for closure. The institution of this monitoring programme will enable the mine to identify and rectify any residual pollution impacts.

The following overarching closure objectives were determined for the Cooke Operations:

- Creating a safe, physically stable rehabilitated landscape that limits long-term erosion potential and environmental degradation;
- Sustaining long term catchment yield and water quality;
- Focussing on establishing a functional post-mining landscape that enables self-sustaining agricultural practices where possible;
- Interconnecting rehabilitated landscapes with surrounding regionally biologically diverse areas;
- Encouraging, where appropriate, the re-instatement of terrestrial and aquatic biodiversity over time; and
- Creating opportunities for alternative post-mining livelihoods by aligning to regional planning.

Based on these objectives an evaluation of the potential post-mining land uses was undertaken as summarised in Table 5-1 below. Ultimately the identified post-mining land uses for 07 MR are agriculture and renewable energy production. The preliminary post-mining land use plan (refer to Plan 5 in Part A), the shaft complexes are proposed to be rehabilitated to natural open areas which can be ceded for these post-mining land uses in future. The post-mining land use will continue to be refined with the evolution of the Decommissioning, Rehabilitation and Closure Plan and SCP as it may be deemed suitable to leave some building infrastructure in place for post-mining land users.



**Table 5-1: Evaluation of Feasible Post-Mining Land Use Options**

Likely	Possible	Unlikely
<ul style="list-style-type: none"> <li>Planted pasture for grazing on rehabilitated infrastructure footprint and other disturbed areas;</li> <li>Maintaining existing cropping, grazing and wilderness areas within non-mining parts of the Mining Right; and</li> <li>Reinstating functionality of impacted ecological areas, and protection of existing areas of conservation importance, including ridges and watercourses.</li> </ul>	<ul style="list-style-type: none"> <li>Intensive and/or alternative agriculture on rehabilitated infrastructure footprint areas or areas of low land capability and conservation significance;</li> <li>Residential development in parts of the MR that are very close to the currently existing residential areas; and</li> <li>Re-use of selected existing mine infrastructure for continued reprocessing of TSFs and other impacted areas, including third party sources as may be viable.</li> </ul>	<ul style="list-style-type: none"> <li>Large-scale urban mixed-use development consisting of medium density housing and commercial retail activities; and</li> <li>Recreation, including passive urban recreation and formal sports facilities.</li> </ul>

Source: Golder Associates Africa (Pty) Ltd., 2020

In addition, the rehabilitation of wetlands affected by current and historic mining activities in the 173 MR is being applied for concurrently to reduce the risk of longer term environmental risk and liabilities for the ongoing Cooke Surface Operations.

## 5.2 Volumes and Rate of Water Use Required for the Operation

Currently Sibanye abstract extraneous underground water that ingresses at Cooke No. 1, 2 and 3 Shafts. This water is discharged at into the Wonderfonteinspruit and the Magazine pan as described in the BAR (Part A). A portion of the abstracted water is also used for domestic purposes as well as any maintenance activities which may be required. A portion of water from Cooke 1 Shaft has also been used as process water at the Cooke Gold Plant. These are approved uses and discharge under the IWUL (Licence No.: 03/A21D/AFGJ/2382, dated 22 November 2013).

Any water requirements associated to the proposed decommissioning and rehabilitation activities will be sourced from the shafts within the allowable limits until such a time as closure activities commence and the pumping of water is permanently ceased.

It should be noted that a new Integrated Water Use Licence Application (IWULA) was applied for to allow for the reclamation of the Millsite TSF and includes abstraction from the Western Basin, this application and the associated activities will continue and are not contemplated in the current application for closure.



Furthermore, the following authorisations are also in place:

- Rand Uranium IWUL (**Licence No.: 03/A21D/AFGJ/2382**) dated 22 November 2013 – for the Cooke Surface and Underground Operations;
- Cooke Operations WUL (**Licence No.: 08/C23D/CGI/3297**) dated 17 July 2015 – Cooke No. 2 Shaft Backfill Plant;
- General Authorisation (**Authorisation No.: 16/2/7/C231/C068**) dated 10 January 2013 for pipeline crossings associated with the Cooke Surface Operations; and
- General Authorisation (**Authorisation No. 27/2/2/A421/5/3**) dated 21 February 2019 for the rehabilitation of the Rand Uranium and Tiger Mills wetlands.

Further to this Sibanye acts as the operating agent for the Western Basin Acid Mine Drainage (AMD) Treatment Facility that operates under the directives issued to the Trans-Caledon Tunnel Authority (TCTA) issued on the 7<sup>th</sup> of November 2011 and 25 May 2015.

### 5.3 Has a Water Use Licence been Applied For

The proposed rehabilitation activities within or in proximity of water resources (wetlands and portions of the Wonderfonteinspruit) trigger water uses in terms of Section 21 (c) and (i) of the NWA for which authorisation is being sought as part of this environmental regulatory process.

## 6 Impacts to be Mitigated in their Respective Phases

Table 6-1 below provides the CEMPr for the Cooke Underground Operations. This also includes the proposed rehabilitation activities for affected water resources and the ongoing operation of the WB TCTA Treatment Facility which forms part of ongoing rehabilitation activities for the Cooke Surface Operations. All other activities associated with the Cooke Surface Operations (i.e. TSF reclamation and processing operations) are approved under separate EMPr's (i.e. the approved Clidet EMPr dated March 2008 and associated addendums) which remain applicable.

As a CEMPr, potential residual and/ or latent impacts have been considered and mitigation measures provided to reduce the likelihood of occurrence of such impacts as far as possible.

**Table 6-1: Closure Environmental Management Programme**

Activity	Aspect Affected	Potential Impact	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
<b>Decommissioning Phase</b>						
1. Removal and decontamination of underground infrastructure	Groundwater; Surface Water resources; and Wetlands	Spills and leaks from materials containing hydrocarbons resulting in deteriorated groundwater quality. These contaminants can impact surface water resources once the water is pumped and discharged into the Magazine Pan.	Cooke No. 1, 2 and 3 Shaft workings; and Local (surrounding waterbodies)	<ul style="list-style-type: none"> <li>• Caution must be taken in the handling of hazardous substances during the removal of underground infrastructure to avoid further contamination;</li> <li>• All waste products must be appropriately contained until it is removed from site for final disposal;</li> <li>• Records of waste removed and appropriately disposed of must be kept on site;</li> <li>• The mine's Environmental representative must inspect waste areas, disposal and storage practices regularly (at least monthly);</li> <li>• If spills or leaks occur, they must be cleaned up immediately, or as soon as the material has suitably dried to prevent secondary contamination, to prevent interaction with groundwater once decommissioning activities are completed; and</li> <li>• Water discharged into the environment must continue to be monitored.</li> </ul>	<ul style="list-style-type: none"> <li>• Section 19 of the NWA (Prevention and remedying effects of pollution); and</li> <li>• Section 2 of NEMA (Principles), subsection (4)(a)(ii) relating to the avoidance/ minimisation of pollution and degradation of the environment.</li> </ul>	Throughout Decommissioning Phase
2. Decommissioning, dismantling and removal of surface infrastructure	Soil resources; and Groundwater	Soil contamination caused by spillages of hazardous substances during decommissioning activities and/or remaining unidentified buried infrastructure (e.g. pipelines). These contaminant could consequently leach and adversely affect groundwater resources.	Cooke No. 1, 2 and 3 Shaft complexes	<ul style="list-style-type: none"> <li>• Stormwater management measures must remain in place during decommissioning activities to prevent soil contamination through run-off;</li> <li>• Infrastructure must be appropriated decontaminated prior to dismantling to avoid spillages during removal;</li> <li>• All known buried pipelines adequately drained to the approved discharge points (Wonderfonteinpruit or Magazine Pan) and subsequently removed;</li> <li>• A detailed site investigation must be carried out to identify unknown buried pipelines. This includes reviewing available information from historic operational activities and/or targeted ground surveillance (where practicable) where pipelines may be expected to occur;</li> <li>• In the event that a spill occurs, rehabilitation of the affected soil must be undertaken as soon as possible. This may include waste classification before disposal of contaminated soils to ensure appropriate and legally compliant disposal;</li> <li>• A comprehensive site assessment must be undertaken of all known holings and survey to locate potential additional holings; and</li> <li>• An action plan to appropriately seal and rehabilitate all known holings must be developed and implemented accordingly.</li> </ul>	<ul style="list-style-type: none"> <li>• Section 19 of the NWA (Prevention and remedying effects of pollution); and</li> <li>• Section 2 of NEMA (Principles), subsection (4)(a)(ii) relating to the avoidance/ minimisation of pollution and degradation of the environment.</li> </ul>	Throughout Decommissioning Phase
	Wetlands	Reduced ecological integrity of wetlands in proximity to decommission activities due to sedimentation caused by erosion on bare surfaces once infrastructure is removed, contamination from possible spillages and/ or changes to drainage patterns.	Local	<ul style="list-style-type: none"> <li>• No decommissioned infrastructures should be placed in wetland/ riparian areas and their associated buffer zones (recommended buffer zone of 100m);</li> <li>• Limit the footprint area of the decommissioning activities to what is absolutely essential;</li> <li>• Avoid any further vegetation clearing and compaction of soils (all areas but critically so in wetland areas) to complete surface decommissioning activities. Only existing crossing must be used to access the areas associated with decommissioning and rehabilitation activities;</li> </ul>	<ul style="list-style-type: none"> <li>• Section 19 of the NWA (Prevention and remedying effects of pollution); and</li> <li>• Section 2 of NEMA (Principles), subsection (4)(a)(ii) relating to the avoidance/ minimisation of pollution and degradation of the environment.</li> </ul>	Throughout Decommissioning Phase

Activity	Aspect Affected	Potential Impact	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
				<ul style="list-style-type: none"> <li>All areas of increased ecological sensitivity (PES of C class and above) should be designated as “No-Go” areas and be off limits to all unauthorised vehicles and personnel;</li> <li>No material may be dumped or stockpiled within any rivers, tributaries or drainage lines in the vicinity of the proposed decommissioning footprint, stockpiling areas should be located in areas to prevent the contamination of downstream water resources;</li> <li>If it is absolutely unavoidable that any of the wetland areas present will be affected, disturbance must be minimised and suitably rehabilitated;</li> <li>Rehabilitation must be undertaken as soon as possible following the decommissioning, dismantling and removal activities. This will prevent the occurrence of soil erosion, soil compaction and/ or encroachment of AIPs which would lead to reduced ecological integrity of downstream water systems;</li> <li>Wherever possible, restrict decommissioning activities to the drier winter months to avoid sedimentation of the wetlands further downstream;</li> <li>All vehicles must be regularly inspected for leaks and refuelling must take place on a sealed surface area;</li> <li>All spills should be immediately cleaned up (or as soon as material has suitably dried to prevent secondary contamination) and treated accordingly;</li> <li>Appropriate sanitary facilities must be provided for the duration of the decommissioning activities and all waste must be removed to an appropriate waste facility; and</li> <li>Ongoing wetland monitoring and rehabilitation is necessary both within and in the vicinity of the proposed decommissioning footprint areas and appropriate wetland monitoring techniques must take place on an annual basis during the summer/wet season in order to identify any emerging issues, trends or improvements in the receiving environment.</li> </ul>		
	Surface Water resources; and Aquatic Biota	Deterioration of water quality in surrounding waterbodies due to siltation caused by erosion on bare surfaces once infrastructure is removed and/ or contamination from possible spillages. This may also consequently result in the loss/ deterred sensitive aquatic biota in immediate reaches affected.	Local	<ul style="list-style-type: none"> <li>Activities should be limited to the decommissioning footprint areas only. No additional clearing should occur;</li> <li>Stormwater management measures must be implemented during infrastructure and pipeline removal to ensure any spills that occur can be adequately contained and do not reach surrounding waterbodies;</li> <li>Once infrastructure is removed, revegetation of cleared areas must be undertaken as soon as possible;</li> <li>Decommissioning activities should be prioritized during dry months of the year (May to October) where practical, though disturbed footprints should not be left un-rehabilitated for extended periods of time;</li> <li>All leaks and spillages should be cleaned timeously and where the materials need to dry before collection, sufficient time should be allowed for collection and handling by accredited vendors;</li> </ul>	<ul style="list-style-type: none"> <li>Section 19 of the NWA (Prevention and remedying effects of pollution); and</li> <li>Section 2 of NEMA (Principles), subsection (4)(a)(ii) relating to the avoidance/ minimisation of pollution and degradation of the environment.</li> </ul>	Throughout Decommissioning Phase

Activity	Aspect Affected	Potential Impact	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
				<ul style="list-style-type: none"> <li>Use of accredited contractors for removal or demolition of infrastructure is recommended; this will reduce the risk of waste generation and accidental spillages;</li> <li>An appointed Environmental Control Officer (ECO) must always be available to ensure implementation of the recommended mitigation/management measures during the planned decommissioning of the project;</li> <li>Rehabilitation of the areas surrounding the Cooke Shafts must be undertaken timeously to re-establish vegetation over bare areas. This will prevent soil erosion and compaction from occurring which would consequently impact surrounding water resources; and</li> <li>The Soil Management Plan (compiled by Digby Wells in 2017) must be implemented to control potential contamination of receiving waterbodies as a result of erosion and compaction.</li> </ul>		
3. Decommissioning of surface dams and concrete channels	Soil; Wetlands; and Surface Water	Established water containment infrastructure diverted mine affected water from downstream watercourses. Once decommissioned, residue contaminants may enter into receiving waterbodies and pollute surrounding soils if runoff is not managed properly.	Cooke No. 1, 2 and 3 Shaft complexes; Pipeline/ channel routes; and Local (surrounding waterbodies)	<ul style="list-style-type: none"> <li>Where practicable, the constructed stormwater management infrastructure should remain intact until rehabilitation is completed to ensure dirty water is captured and contained during removal of infrastructures;</li> <li>Where stormwater management infrastructure cannot be kept, temporary measures (e.g. berms and sumps) should be put in place to prevent contaminants running off into receiving waterbodies and wetlands;</li> <li>Ensure that the infrastructure (pipelines, fuel storage areas, pumps) are first emptied of all residual material before decommissioning;</li> <li>Rehabilitation of the areas surrounding the Cooke Shafts must be undertaken timeously to ensure that contaminated sediments and or wastewater is not discharged into the Wonderfontein spruit River; and</li> <li>The Soil Management Plan (compiled by Digby Wells in 2017) must be implemented to control potential contamination of receiving waterbodies as a result of the mobility of potentially contaminated soil.</li> </ul>	<ul style="list-style-type: none"> <li>Section 19 of the NWA (Prevention and remedying effects of pollution); and</li> <li>Section 2 of NEMA (Principles), subsection (4)(a)(ii) relating to the avoidance/ minimisation of pollution and degradation of the environment.</li> </ul>	Throughout Decommissioning Phase
4. General Decommissioning Phase activities	Heritage	Damage to or destruction of previously unidentified heritage resources.	Cooke No. 1, 2 and 3 Shaft complexes; and Pipeline/ channel routes	<ul style="list-style-type: none"> <li>A Chance Find Produce (CFP) must be developed and implemented accordingly.</li> </ul>	<ul style="list-style-type: none"> <li>Section 5 of NHRA, relating to the management of heritage resources management</li> </ul>	Throughout Decommissioning Phase.
	Socio-economic	Potential increase in dust fallout and noise levels associated with surface infrastructure decommissioning activities resulting in a nuisance impact to nearby receptors.	Local	<ul style="list-style-type: none"> <li>Decommissioning activities should be limited to the daytime;</li> <li>Any machinery used for decommissioning activities must be switched-off when not in use to prevent unnecessary noise generation;</li> <li>Wetting agents, dust suppressant or binders must be used on the exposed areas as required to minimise dust generation;</li> <li>Activities must be conducted judiciously during windy days (wind speed above <math>\geq 5.4</math> m/s) to minimise dust generation;</li> </ul>	<ul style="list-style-type: none"> <li>National Noise Control Regulations for acceptable daytime noise levels below 70 dBA and/ or the target criterion of 55/ 45 dbA day and night respectively based on baseline and</li> </ul>	Throughout Decommissioning Phase



Activity	Aspect Affected	Potential Impact	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
				<ul style="list-style-type: none"> <li>The drop heights when loading and tipping must be minimised as far as practicable; and</li> <li>Dust and noise monitoring must continue per the established programmes at the operations.</li> </ul>	historical measurements at the operation; and <ul style="list-style-type: none"> <li>South African National Dust Fallout Standard for acceptable dust fallout &lt; 600 mg/m<sup>2</sup>/day, 30-days average for residential areas. No exceedances of more than in an annum and non-sequential, as per the dust management plan for the operations.</li> </ul>	
		Increased health and safety risks for the workforce associated with handling of hazardous substances and other decommissioning activities.	Cooke No. 1, 2 and 3 Shaft complexes; and Pipeline/channel routes	<ul style="list-style-type: none"> <li>All appointed Contractors and their employees should undergo Sibanye's EH&amp;S induction and training and comply with the relevant policies and procedures during the execution of activities;</li> <li>Ensure adequate PPE (inclusive of COVID-19 PPE) is provided to the workforce;</li> <li>Hydrocarbon spill kits must be available during decommissioning activities at all locations where hydrocarbon spills could take place;</li> <li>MSDSs must be kept to inform and promote correct handling of hazardous substances;</li> <li>Storage and disposal of hazardous materials must adhere to prescribed regulation; and</li> <li>Ensure that all employees including Contractor workforce have access to onsite medical facilities available to the Sibanye workforce.</li> </ul>	<ul style="list-style-type: none"> <li>Chapter 2 of the Mine Health and Safety, 1996 (Act No. 29 of 1996) (MHSA) relating to health and safety at mines</li> </ul>	Throughout Decommissioning Phase
		Decreased community health and safety due to inappropriate disposal of hazardous waste.	Local	<ul style="list-style-type: none"> <li>Waste must be stored in a demarcated secured area until collection. The area should be clearly marked to warn off trespassers;</li> <li>Adhere to the regulatory standards for disposal of hazardous waste generated from the decommissioning activities;</li> <li>Ensure appointment of reputable Contractors to undertake the decommissioning and disposal of waste;</li> <li>Ensure all records are kept of safe disposal of waste; and</li> <li>The ECO at decommissioning sites must inspect waste areas, disposal and storage practices regularly (at least weekly).</li> </ul>	<ul style="list-style-type: none"> <li>Section 2 of NEMA (Principles), subsection (4)(a)(iv) relating to responsible disposal of waste; and</li> <li>Section 2(iv) of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEM:WA) relating to safe disposal of waste.</li> </ul>	Throughout Decommissioning Phase
		Creation of temporary economic opportunities to carried out decommissioning activities.	Local (WRDM)	<ul style="list-style-type: none"> <li>Ensure that local communities understand the Project's procurement and employment requirements in terms of skills and type of contracts and employment. This will be achieved using existing stakeholder communication channels and through the Sibanye-Stillwater's Stakeholder Relations office;</li> <li>Targets must be set for local employment regardless of the size the work program and continue to report on these as part of the active 2017 to 2021</li> </ul>	<ul style="list-style-type: none"> <li>Section 41 of the MPRDA (Objectives of SLP), subsection (a) relating to the promotion of employment and</li> </ul>	Prior to and throughout the Decommissioning Phase

Activity	Aspect Affected	Potential Impact	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
				<p>SLP. Targets must include employment of youths and women from historically disadvantaged backgrounds; and continuously monitored;</p> <ul style="list-style-type: none"> <li>Consider unbundling of contracts into small work programs to ensure that small and locally based businesses are able to benefit;</li> <li>Propose and promote joint ventures between large and small Contractors to ensure equitable sharing of economic benefits and skills development;</li> <li>All tender process must follow existing Sibanye SMME development strategies and programs; and</li> <li>Projects which can involve community groups and ring-fencing of procurement opportunities where applicable must be identified.</li> </ul>	<ul style="list-style-type: none"> <li>advancement of social and economic welfare;</li> <li>Sibanye SLP and related policies; and</li> <li>Relevant local IDPs.</li> </ul>	
		Value-add in the sale of salvageable goods to local supply chain.	Local/ regional	<ul style="list-style-type: none"> <li>Prior to the undertaking of decommissioning activities, an inventory of infrastructure and equipment which can be sold must be established;</li> <li>Sibanye must collaborate with the Mineral Council South Africa's to identify potential buyers of mining specific infrastructure and equipment;</li> <li>Priority must be placed on local businesses and communities who are interested buying any of the decommissioned infrastructure; and</li> <li>Decommissioning and dismantling of infrastructure must be undertaken by a qualified contractor to ensure that infrastructure is correctly preserved for future sale.</li> </ul>	<ul style="list-style-type: none"> <li>Section 41 of the MPRDA (Objectives of SLP), subsection (c) relating to the contribution to socio-economic development respectively;</li> <li>Sibanye SLP and related policies; and</li> <li>Relevant local IDPs.</li> </ul>	Prior to and throughout the Decommissioning Phase
		Community unrest due to a perceived lack economic opportunities and unfulfilled promises.	Local	<ul style="list-style-type: none"> <li>Undertake ongoing consultation with local communities (including local authorities and traditional leadership) and clearly communicate project needs and schedule;</li> <li>Encourage communities to utilise the existing grievance procedure to communicate their issues and ensure timeous response to all lodged complaints and grievances;</li> <li>Utilise existing procurement and employment plans that promote transparent and fair recruitment and procurement for the undertaking of decommissioning activities; and</li> <li>Ensure the development and implementation of the SCP.</li> </ul>	<ul style="list-style-type: none"> <li>Section 41 of the MPRDA (Objectives of SLP), subsection (a) relating to the promotion of employment and advancement of social and economic welfare;</li> <li>Sibanye SLP and related policies; and</li> <li>Relevant local IDPs.</li> </ul>	Throughout Decommissioning Phase
		Increased security risk (invasions and theft) caused by the presence of valuable material and/ or remaining unidentified buried infrastructure (e.g. pipelines) or holings.	Cooke No. 1, 2 and 3 Shaft complexes	<ul style="list-style-type: none"> <li>The existing security controls and measures must continue to be implemented until all decommissioning and rehabilitation activities are completed;</li> <li>Collaborate with local police services in managing the security of the mine shafts;</li> <li>The boundary fencing must be inspected regularly, where damage is identified this must be repaired as soon as possible;</li> <li>All known buried pipelines should be removed as part of the decommissioning activities;</li> <li>A detailed site investigation must be carried out to identify unknown buried pipelines. This includes reviewing available information from historic operational activities and/or targeted ground surveillance (where practicable) where pipelines may be expected to occur;</li> </ul>	<ul style="list-style-type: none"> <li>Chapter 2 of the Mine Health and Safety, 1996 (Act No. 29 of 1996) (MHSA) relating to health and safety at mines.</li> </ul>	Throughout Decommissioning Phase



Activity	Aspect Affected	Potential Impact	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
				<ul style="list-style-type: none"> <li>A comprehensive site assessment must be undertaken of all known holings and survey to locate potential additional holings during the decommissioning and rehabilitation phase; and</li> <li>An action plan to appropriately seal and rehabilitate all known holings must be developed and implemented accordingly during the decommissioning and rehabilitation phase.</li> </ul>		
<b>Rehabilitation Phase</b>						
1. Removal of settled solids from surface paddocks, mud ponds and general areas at shaft complexes as well as from the coffer dams at the Cooke Gold Plant.	Soil resources; and Surface Water resources; and Aquatic Biota	Contamination of surrounding soils and adjacent waterbodies as a result of spillages of settled solids. This would consequently result in a deterioration of water quality and possible loss/ deterred sensitive aquatic biota in immediate reaches affected.	Cooke No. 1, 2 and 3 Shaft complexes; and Local (surrounding waterbodies)	<ul style="list-style-type: none"> <li>Stormwater management infrastructure must be maintained until the completion of this activities to prevent the spread of contaminants into receiving waterbodies and wetlands;</li> <li>Where practicable, dust suppression measures must be implemented to prevent the spread of contaminants through atmospheric deposition; and</li> <li>All settled solids removed must not be stockpiled for extended periods of time but rather be timeously processed through the Cooke Gold Plant/ disposed into the open pits to remove the potential pollution source from the landscape.</li> </ul>	<ul style="list-style-type: none"> <li>Section 19 of the NWA (Prevention and remedying effects of pollution); and</li> <li>Section 2 of NEMA (Principles), subsection (4)(a)(ii) relating to the avoidance/ minimisation of pollution and degradation of the environment.</li> </ul>	Throughout Rehabilitation Phase
	Wetlands	Reduced ecological integrity of nearby wetlands/ riparian areas as a result of sedimentation through runoff or atmospheric deposition and associated water quality impacts.	HGM Units located between 250 m – 600 m of Cooke No. 1 and 2 Shaft Areas	<ul style="list-style-type: none"> <li>Stormwater management infrastructure must be maintained until the completion of this activities to prevent the spread of contaminants into receiving waterbodies and wetlands;</li> <li>Where practicable, the paddocks should be maintained, i.e. the same impacted footprints should be used, until the rehabilitation activities are complete, and thereafter they may be removed. This will prevent the creation of additional dirty areas and the further alteration of the catchment; and</li> <li>Ensure that sediment that is removed from these footprints is not stored within the buffer zones and that it is removed offsite timeously and appropriately.</li> </ul>	<ul style="list-style-type: none"> <li>Section 19 of the NWA (Prevention and remedying effects of pollution); and</li> <li>Section 2 of NEMA (Principles), subsection (4)(a)(ii) relating to the avoidance/ minimisation of pollution and degradation of the environment.</li> </ul>	Throughout Rehabilitation Phase
2. Rehabilitation of surface paddocks, mud ponds and the coffer dams; and 3. Rehabilitation of surface dams, concrete channels and general areas at the shaft complexes once infrastructure is removed.	Soil resources; Surface Water resources; Aquatic Biota; and Groundwater	Possible inadequate removal of all existing sources of contamination (incl. legacy sources) resulting in soil and surface water contamination. This would consequently result in a deterioration of water quality and possible loss/ deterred sensitive aquatic biota in immediate reaches affected.	Cooke No. 1, 2 and 3 Shaft complexes; and Local (surrounding waterbodies)	<ul style="list-style-type: none"> <li>All known sources of contamination must be removed as part of rehabilitation and disposed of in an appropriate manner as informed by the waste classification of the material;</li> <li>All WRDs are currently being reprocessed and resulting residue will be used as backfill for the shafts. Remaining WRDs will also be utilised as backfill for remaining cavities and voids due to infrastructure demolition and removal. Note: waste classification should be confirmed to ensure backfilling operations are aligned with legal requirements;</li> <li>The sites be inspected for any unknown hydrocarbon spillages. If identified, this must be removed as soon as possible and disposed of appropriately and in accordance with legal requirements;</li> <li>Soil contamination assessments must be carried out during rehabilitation. Where contaminated soils are identified this must be removed and disposed of appropriately and in accordance with legal requirements; and</li> <li>Stormwater management structures must be maintained throughout rehabilitation to prevent contaminants being carried by run-off.</li> </ul>	<ul style="list-style-type: none"> <li>Section 2 of NEMA (Principles), subsection (4)(a)(ii) relating to the avoidance/ minimisation of pollution and degradation of the environment; and</li> <li>Section 56 of the MPRDA (Principles of Closure), subsection (e) relating to the rehabilitation of land to its natural state or agreed stand which conforms with the concept of Sustainable Development</li> </ul>	Throughout Rehabilitation Phase



Activity	Aspect Affected	Potential Impact	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
	Surface Water resources; and Wetlands	Restored drainage of runoff into the Wonderfonteinspruit and surrounding wetlands, although the natural flow paths will now be altered	Local	<ul style="list-style-type: none"> <li>Soil contamination testing must be undertaken as part of rehabilitation to ensure that soil at the surface paddocks, mud ponds and coffer dams is free of any unacceptable levels of heavy metals or mine contaminants. This will inform any further rehabilitation requirements in terms of soils and immediate surroundings to meet the post-mining land use (agriculture);</li> <li>Land must be shaped with the aim for a free draining profile, avoiding the potential for water ponding to occur;</li> <li>Integrate the post-mining storm water planning as part of the landform design to align the surface water runoff with the site wide natural drainage framework; and</li> <li>Surface water modelling must be included as part of the landform design to inform a desired hydrological landscape to avoid impacts to the downstream catchment.</li> </ul>	<ul style="list-style-type: none"> <li>Section 2 of NEMA (Principles), subsection (4)(a)(i) relating to the remediation of disturbed ecosystems and the loss of biological diversity; and</li> <li>Section 56 of the MPRDA (Principles of Closure), subsection (e) relating to the rehabilitation of land to its natural state or agreed stand which conforms with the concept of Sustainable Development</li> </ul>	Throughout Rehabilitation Phase
	Terrestrial Biodiversity	Re-instatement of adequate soil cover and subsequent re-establishment of natural vegetation to achieve the post-mining land use. This would also provide suitable habitat for faunal species.	Cooke No. 1, 2 and 3 Shaft complexes	<ul style="list-style-type: none"> <li>Rehabilitation must be carried out timeously following the decommissioning and removal of infrastructure, including adequate studies and plans to inform responsible rehabilitation;</li> <li>A volumetric assessment to quantify the amount of soil needed to adequately rehabilitate disturbed areas must be undertaken as part of the post-mining landform design which is integrated with the stormwater management plan, use of soil from unimpacted areas should be discouraged as much as possible;</li> <li>The determined post-mining land use must be revisited and refined based on the outcomes of the post-mining landform design, volumetric assessment and actual material availability;</li> <li>Construct suitable slope gradients and additional storm water measures as required based on detailed post mining landform designs integrated hydrological and erosion modelling;</li> <li>Continue the maintenance of stormwater management infrastructure throughout the decommissioning and rehabilitation phase to ensure effective functioning until all activities are completed;</li> <li>Following soil cover, ameliorate soils based on dedicated fertility sampling and analysis. Subsequently, seed all disturbed (bare) areas with a suitable indigenous species mix as prescribed in the Rehabilitation Plan;</li> <li>A prioritised AIP control programme must be developed and implemented during the rehabilitation phase, focussing on watercourses and areas of densest infestation;</li> <li>In the event that certain AIPs are deemed beneficial to terrestrial biodiversity, the required permits must be obtained to leave/ plant these species in rehabilitation areas;</li> <li>Ongoing monitoring of surface and groundwater for early detection of any deviations from the RQO's of the catchment area assess the effectiveness of the Rehabilitation Plan;</li> </ul>	<ul style="list-style-type: none"> <li>Section 2 of NEMA (Principles), subsection (4)(a)(i) relating to the remediation of disturbed ecosystems and the loss of biological diversity; and</li> <li>Section 56 of the MPRDA (Principles of Closure), subsection (e) relating to the rehabilitation of land to its natural state or agreed stand which conforms with the concept of Sustainable Development</li> </ul>	Throughout Rehabilitation Phase

Activity	Aspect Affected	Potential Impact	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
				<ul style="list-style-type: none"> <li>Suitable habitat must be created based on surrounding landforms; and</li> <li>In the event that WRDs are to be left in-situ, the post-mining landform design should quantify the earth works required to meet the end land use criteria and cover requirements based on available material;</li> <li>Radiation assessments are recommended to be conducted to develop appropriate management plans for the shaft complexes and other mine infrastructure areas to be rehabilitated.</li> </ul>		
4. Rehabilitation of the Magazine Pan and other delineated wetlands (incl. portions of the Wonderfontein spruit).	Wetlands; and Terrestrial Biodiversity	Improved ecological integrity of wetlands/ riparian areas as a result of the removal of contamination sources, AIPs and re-vegetation of indigenous species.	Magazine Pan	<ul style="list-style-type: none"> <li>Specific rehabilitation plans should be developed for each HGM Unit targeted for rehabilitation based on the current WET-Health of the system;</li> <li>The rehabilitation plan should take into account the impact of the changes in flow paths that is anticipated for the Magazine Pan to preserve the wetland area and the associated ecological functioning of the pan;</li> <li>Monitoring of wetland rehabilitation activities must be undertaken throughout the rehabilitation phase; and</li> <li>If monitoring determines that additional rehabilitation actions are required, ensure that these are implemented as soon as possible to stop further degradation occurring.</li> </ul>	<ul style="list-style-type: none"> <li>Section 2 of NEMA (Principles), subsection (4)(a)(i) relating to the remediation of disturbed ecosystems and the loss of biological diversity; and</li> <li>Section 19 of the NWA (Prevention and remedying effects of pollution); and</li> </ul>	Throughout Rehabilitation Phase
5. General Rehabilitation Phase activities, including both the underground and surface operations	Socio-economic	Potential increase in dust fallout and noise levels associated with surface rehabilitation activities resulting in a nuisance impact to nearby receptors.	Cooke No. 1, 2 and 3 Shaft complexes; and Wetland footprints	<ul style="list-style-type: none"> <li>Dust monitoring must be undertaken until vegetation re-establishes on all bare surfaces;</li> <li>Where dust generation is occurring, appropriate dust suppression measures must be investigated and implemented accordingly;</li> <li>Rehabilitation activities should be limited to the daytime; and</li> <li>Any machinery used for rehabilitation activities must be switched-off when not in use to prevent unnecessary noise generation.</li> </ul>	<ul style="list-style-type: none"> <li>National Noise Control Regulations for acceptable daytime noise levels below 70 dBA; and</li> <li>South African National Dust Fallout Standard for acceptable dust fallout &lt; 600 mg/m<sup>2</sup>/day, 30-days average for residential areas.</li> </ul>	Throughout Rehabilitation Phase
		Improved visual amenity as a result of the removal of infrastructure and rehabilitation of disturbed footprints	Cooke No. 1, 2 and 3 Shaft complexes	<ul style="list-style-type: none"> <li>A final visual assessment must be undertaken following the completion of rehabilitation activities. Where deemed necessary, additional measures must be prescribed and implemented accordingly for this positive impact to be realised,</li> </ul>		
		Community health and safety risks associated with access to project areas.	Cooke No. 1, 2 and 3 Shaft complexes	<ul style="list-style-type: none"> <li>Access control must be maintained until areas are fully rehabilitated;</li> <li>The shafts must be capped on surface to prevent access to the shafts; and</li> <li>All waste and hazardous substances kept on site during rehabilitation activities must be appropriately contained.</li> </ul>	<ul style="list-style-type: none"> <li>Section 2 of NEMA (Principles), subsection (4)(a)(iv) relating to responsible disposal of waste.</li> </ul>	Throughout Rehabilitation Phase
		Creation of temporary economic opportunities to be carried out during rehabilitation activities.	Cooke No. 1, 2 and 3 Shaft complexes; and	<ul style="list-style-type: none"> <li>Ensure that local communities understand the Project's procurement and employment requirements in terms of skills and type of contracts and employment. This will be achieved using existing stakeholder communication channels and through the Sibanye-Stillwater's Stakeholder Relations office;</li> </ul>	<ul style="list-style-type: none"> <li>Section 41 of the MPRDA (Objectives of SLP), subsection (a) relating to the promotion of employment and</li> </ul>	Prior to and throughout the Rehabilitation Phase

Activity	Aspect Affected	Potential Impact	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
			Wetland footprints	<ul style="list-style-type: none"> <li>Targets must be set for local employment regardless of the size the work program and continue to report on these as part of the active 2017 to 2021 SLP. Targets must include employment of youths and women from historically disadvantaged backgrounds; and continuously monitored;</li> <li>Consider unbundling of contracts into small work programs to ensure that small and locally based businesses are able to benefit;</li> <li>Propose and promote joint ventures between large and small Contractors to ensure equitable sharing of economic benefits and skills development;</li> <li>All tender process must follow existing Sibanye SMME development strategies and programs; and</li> <li>Projects which can involve community groups and ring-fencing of procurement opportunities where applicable must be identified.</li> </ul>	advancement of social and economic welfare; <ul style="list-style-type: none"> <li>Sibanye SLP and related policies; and</li> <li>Relevant local IDPs.</li> </ul>	
6. Continued Operation of the TCTA WB AMD Facility <sup>2</sup> (compiled by the MSA Group, 2018)	Surface Water	Discharge of treated water into the Tweelopiespruit may result in deteriorating water quality affecting beneficial water uses, human and animal health.	Local	<ul style="list-style-type: none"> <li>Effluent treatment must operate within the design parameters prescribed The MSA Group (2018) for the Operation of the TCTA WB AMD Facility at all times;</li> <li>Discharged effluent must meet the standards as prescribed by the Department of Water and Sanitation (DWS) (refer to "Approval of Effluent Discharge Standards from HDS Plants in the Western, Central and Eastern Basin" Ref: AMDDIR- TCTA-01.03.2011, dated 03 October 2016);</li> <li>Surface water monitoring in the Tweelopiespruit must continue to be undertaken.</li> </ul>	<ul style="list-style-type: none"> <li>Section 19 of the NWA (Prevention and remedying effects of pollution); and</li> <li>Section 2 of NEMA (Principles), subsection (4)(a)(ii) relating to the avoidance/ minimisation of pollution and degradation of the environment.</li> </ul>	Throughout Operational Phase
		An increase in water volumes in the receiving catchment which may result in flooding and decant from historical underground workings, channel instability, potential movement of contaminated sediments, remobilisation of metals from sediment through drying and subsequent inundation and/or lack of flow in upstream reach.	Local	<ul style="list-style-type: none"> <li>A minimum of 30M<sup>3</sup>/day of AMD will be treated;</li> <li>Maintenance of the Portuguese Dam level to prevent excessive flow in wetland;</li> <li>Develop a long-term rehabilitation plan for the area that can be incorporated into the rehabilitation plan and Clidet EMPr; and</li> <li>Decant water needs to be contained in the BRI pond where possible, before releasing into the environment, and treated to an acceptable quality as per the DWS directive.</li> </ul>		

<sup>2</sup> Note the operation of the TCTA is a joint responsibility between DWS, TCTA and other mining companies and therefore the implementation of these measures must be driven by the DWS and the TCTA as their implementing agent.

Activity	Aspect Affected	Potential Impact	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
	Terrestrial Biodiversity	Discharge of water into the Tweelopiespruit will affect the ecological flows in that the base flows will be higher year-round. The water quality is not of an appropriate quality to support the ecology. The high salt loads and the resulting formation of precipitate will result in the deterioration of instream, marginal and riparian habitat.	Local	<ul style="list-style-type: none"> <li>A minimum of 30M<sup>3</sup>/day of AMD will be treated; and</li> <li>Manage water quality or the resultant impacts due to the water quality to improve the ecological class from the current state to meet the requirements of the directive;</li> <li>Aquatic bio-monitoring in the Tweelopiespruit must continue to be undertaken.</li> </ul>	<ul style="list-style-type: none"> <li>Section 19 of the NWA (Prevention and remedying effects of pollution); and</li> <li>Section 2 of NEMA (Principles), subsection (4)(a)(ii) relating to the avoidance/ minimisation of pollution and degradation of the environment.</li> </ul>	Throughout Operational Phase
	Groundwater	Deterioration of groundwater quality as a result of the discharge of treated water and the storage of sludge potentially impacting on the groundwater quantity.	Local	<ul style="list-style-type: none"> <li>Discharged effluent must meet the standards as prescribed by the DWS (refer to "Approval of Effluent Discharge Standards from HDS Plants in the Western, Central and Eastern Basin" Ref: AMDDIR- TCTA-01.03.2011, dated 03 October 2016; and</li> <li>Groundwater monitoring in the mine void must continue to be undertaken.</li> </ul>	<ul style="list-style-type: none"> <li>Section 19 of the NWA (Prevention and remedying effects of pollution); and</li> <li>Section 2 of NEMA (Principles), subsection (4)(a)(ii) relating to the avoidance/ minimisation of pollution and degradation of the environment.</li> </ul>	Throughout Operational Phase
	Geology	Reducing pressure through dewatering in mine voids and dolomite solution cavities has the potential for collapse (geology instability).	Local	<ul style="list-style-type: none"> <li>If subsidence is detected, the operator will immediately investigate and identify the cause and implement appropriate mitigation measures to prevent further subsidence; and</li> <li>Where necessary, land disturbed by subsidence will be landscaped.</li> </ul>	<ul style="list-style-type: none"> <li>Section 2 of NEMA (Principles), subsection (4)(a)(i) relating to the remediation of disturbed ecosystems and the loss of biological diversity.</li> </ul>	Throughout Operational Phase
	Heritage resources	Discharge of treated water into the Tweelopiespruit may impact on heritage resources.	Local	<ul style="list-style-type: none"> <li>If artefacts or sites of significance are discovered during the operational activities, all work will cease in the area affected and the operator will immediately inform the TCTA;</li> <li>Heritage material may only be removed or destroyed if the appropriate permits have been obtained and when the conditions of these permits are adhered to; and</li> <li>Should any graves or potential human remains be found, the South African Police Service should be contacted.</li> </ul>	<ul style="list-style-type: none"> <li>Section 5 of NHRA, relating to the management of heritage resources management</li> </ul>	Throughout Operational Phase
	Socio-economic	Increased community health risks associated with the exposure to surface water and soil should decanting take place – sulphates, nitrates, heavy metals, radionuclides as well as access to the facility	Local	<ul style="list-style-type: none"> <li>Effluent treatment must operate within the design parameters (refer to Section 2.3) at all times;</li> <li>Discharged effluent must meet the standards as prescribed by the DWS (refer to "Approval of Effluent Discharge Standards from HDS Plants in the Western, Central and Eastern Basin" Ref: AMDDIR- TCTA-01.03.2011, dated 03 October 2016);</li> <li>A minimum of 30M<sup>3</sup>/day of AMD will be treated; and</li> </ul>	<ul style="list-style-type: none"> <li>Section 2 of NEMA (Principles), subsection (4)(a)(ii) relating to the avoidance/ minimisation of pollution and degradation of the environment.</li> </ul>	Throughout Operational Phase



Activity	Aspect Affected	Potential Impact	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
				<ul style="list-style-type: none"> <li>Effective access control to the AMD Treatment Facility must be ensured;</li> <li>The implementation of effective management measures to minimise impacts associated with increased demands on local infrastructures (roads) and services; and</li> <li>The signs must indicate the risks involved in entering the site and the person responsible for the operation of the site.</li> </ul>		
		Employment opportunities as people in the surrounding	Local (WRDM)	<ul style="list-style-type: none"> <li>Create opportunities for the employment of local community members where possible e.g. if the plant capacity is increased;</li> <li>Training of labour to benefit individuals beyond the project;</li> <li>Ensure suitable management of labour force to prevent security related issues or disturbance to landowners;</li> <li>Weather-proof, durable and legible signs in at least three official languages applicable in the area must be displayed at each entrance to the site; and</li> <li>The implementation of effective management measures to minimise impacts associated with environmental aspects such as noise pollution and visual disturbances.</li> </ul>	<ul style="list-style-type: none"> <li>Section 41 of the MPRDA (Objectives of SLP), subsection (a) relating to the promotion of employment and advancement of social and economic welfare;</li> <li>Sibanye SLP and related policies; and</li> <li>Relevant local IDPs.</li> </ul>	Throughout Operational Phase
		General operation activities of the facility resulting contamination (hydrocarbon spillages and/or mishandled waste or other hazardous substances).	Surface Water resources; Groundwater; and Soil resources	<ul style="list-style-type: none"> <li>Identify potential sources and risks for spillages and leaks of hazardous substances;</li> <li>Ensure that infrastructure design and operating procedures are established and implemented taking the above into consideration;</li> <li>General operations that involve the use, handling and storage of hazardous substance are conducted in a manner that prevents uncontrolled spillage. Suitable containment, isolation and clean-up equipment and measures are in place and maintained;</li> <li>All vehicles and equipment will be kept in good working order and serviced regularly to minimise risks;</li> <li>Vehicles and equipment to be washed in the designated wash bay;</li> <li>In the events of spillages, containment and clean-up measures are to be implemented effectively and resulting hazardous waste is to be handled in accordance with the waste management requirements;</li> <li>Proper emergency response procedure to be in place for dealing with spills and leaks and be tested at least once in six months (drills to be conducted). Implementation of the Waste Management Procedure: including but not limited to: <ul style="list-style-type: none"> <li>Waste separation at source using coloured drums;</li> <li>Storage of waste in such a manner that no pollution of the environment occurs at any time;</li> <li>Identification of waste streams, sources and quantities of waste generated; and</li> <li>MSDSs must be present for all hazardous materials stored on site</li> </ul> </li> <li>All personnel who work with hazardous waste must be trained to deal with these potential hazardous situations and</li> </ul>	<ul style="list-style-type: none"> <li>Section 2 of NEMA (Principles), subsection (4)(a)(ii) relating to the avoidance/ minimisation of pollution and degradation of the environment; and</li> <li>Section 2 of NEMA (Principles), subsection (4)(a)(iv) relating to responsible disposal of waste.</li> </ul>	Throughout Operational Phase

Activity	Aspect Affected	Potential Impact	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
				<ul style="list-style-type: none"> <li>Waste precipitate that has formed in the trains is to be cleared as and when needed and disposed of accordingly (i.e. into the West Wits Pit).</li> </ul>		
7. Continued Cooke Surface Operations	-	-	-	<ul style="list-style-type: none"> <li>The surface operations should continue to be managed as per the approved Clidet EMPr and addendum application for the reclamation of the Millsite TSF and other third party resources;</li> <li>For better environmental management, it is recommended that the prescribed mitigation measures in the Clidet EMPr and subsequent addendums, be consolidated into a single EMPr.</li> </ul>	-	-
<b>Closure Phase</b>						
1. Possible refurbishment of plugs between Cooke No. 3 and Cooke No. 4 Shafts, as well as between Cooke No. 1 and Doornkop Mine.	Groundwater	Flow of water into Cooke No. 4 Shaft (Ezulwini Gold Mine).	Cooke No. 3 Shaft	<ul style="list-style-type: none"> <li>The plugs between Cook No. 3 Shaft and Cooke No. 4 Shaft (Ezulwini Gold Mine) must be inspected by a relevant qualified engineer. Where it is determined that plug repairs are required, this must be carried out accordingly prior to rewatering.</li> </ul>	<ul style="list-style-type: none"> <li>Section 56 of the MPRDA (Principles of Closure), subsection (e) relating to the rehabilitation of land to its natural state or agreed stand which conforms with the concept of Sustainable Development</li> </ul>	Prior to Closure Phase (rewatering)
2. Potential capping of the shaft barrel below the dolomitic aquifer	Groundwater	Flow of water into the dolomitic aquifer.	Cooke No. 3 Shaft	<ul style="list-style-type: none"> <li>The Hydrogeology Study determined that there is no requirement to cap the shaft barrel below the dolomitic aquifer due to the acceptable water quality expected. Groundwater monitoring in the shafts should however continue as water levels start to recover to ascertain this prediction.</li> </ul>	<ul style="list-style-type: none"> <li>Section 56 of the MPRDA (Principles of Closure), subsection (e) relating to the rehabilitation of land to its natural state or agreed stand which conforms with the concept of Sustainable Development</li> </ul>	Prior to Closure Phase (rewatering)
3. Backfilling and sealing of ventilation shafts	Surface Water resources; and Groundwater	Water contamination as a result of backfill material used to seal the ventilation shafts.	Cooke No. 1, 2 and 3 ventilation shafts	<ul style="list-style-type: none"> <li>Ventilation shafts must only be backfilled with non-hazardous rock material and/or non-contaminated rubble material to avoid potential water pollution as well as preventing access to the underground areas.</li> </ul>	<ul style="list-style-type: none"> <li>Section 19 of the NWA (Prevention and remedying effects of pollution); and</li> <li>Section 2 of NEMA (Principles), subsection (4)(a)(ii) relating to the avoidance/ minimisation of pollution and degradation of the environment.</li> </ul>	Throughout Closure Phase
	Socio-economic	Human and animal health and safety risks associated with access through the ventilation shafts	Cooke No. 1, 2 and 3 ventilation shafts	<ul style="list-style-type: none"> <li>Compile a site-wide materials balance to quantify availability of suitable material adequately backfill the ventilation shafts. If existing material is found to be insufficient, additional non-hazardous material must be sourced to supplement addition material to ensure backfill is completed (potential sources include the demolition rubble from the planned removal of the surface infrastructure);</li> </ul>	<ul style="list-style-type: none"> <li>Section 2 of NEMA (Principles), subsection (4)(a)(ii) relating to the avoidance/ minimisation of pollution and degradation of the environment.</li> </ul>	Throughout Closure Phase

Activity	Aspect Affected	Potential Impact	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
				<ul style="list-style-type: none"> <li>Once backfilled reinforced concrete shaft plugs on surface should be constructed based on detailed engineering designs to prevent access to the underground workings;</li> <li>Access control must be maintained until rehabilitation is fully completed; and</li> <li>Rewatering (as intended) is key to preventing access to the underground workings.</li> </ul>		
4. Rewatering of underground workings	Surface Water	<p>Reduced flow in the Wonderfonteinspruit downstream of the discharge point as a result of the cessation of discharge activity to rewater the workings. This will likely affect downstream water uses/ users.</p> <p>Deterioration of water quality downstream of the discharge point caused by the cessation of pumping into the Wonderfonteinspruit which provided dilution effects to water from the upstream reaches of the Wonderfonteinspruit which has experienced impacts from surrounding land uses.</p>	Local	<ul style="list-style-type: none"> <li>Water quality monitoring downstream of the Cooke No. 1 Shaft discharge point into the Wonderfonteinspruit must continue into the post-closure phase;</li> <li>Further grid sampling to the completed waste characterisation is recommended upon the cessation of discharge to confirm areas that could not be accessed due to inundation. Any additional rehabilitation measure to reduce the risk of water contamination from accumulated sediments must be informed based on the outcomes; and</li> <li>Where significant adverse changes are detected to water quality, mitigation measures must be investigated and implemented accordingly.</li> </ul>	<ul style="list-style-type: none"> <li>Section 19 of the NWA (Prevention and remedying effects of pollution); and</li> <li>Section 2 of NEMA (Principles), subsection (4)(a)(ii) relating to the avoidance/ minimisation of pollution and degradation of the environment.</li> </ul>	Throughout Closure Phase
	Wetlands	<p>Possible shrinking of the Magazine Pan and wetland sections along the Wonderfonteinspruit as a response to the change in surface water flow patterns (reduction) caused by the cessation of discharge.</p> <p>Reduced ecological integrity of downstream wetlands due to adverse water quality impacts caused by the cessation of pumping into the Wonderfonteinspruit which provided dilution effects to water from the upstream reaches of the Wonderfonteinspruit which</p>	Local	<ul style="list-style-type: none"> <li>Consideration to the rehabilitation options that should be considered for Magazine Pan even though this is an artificial system that has been created, there is an opportunity to maintain this system as a wetland and improve the functionality of the system and overall the biodiversity despite reduced inflows;</li> <li>Ongoing groundwater monitoring and modelling to determine if there is the potential that additional decant points would occur over time to ensure that the appropriate mitigation measures are implemented to protect water resources in the event that decant does occur;</li> <li>Investigate and determine prefeasibility treatment options for integration into the larger closure strategy for the region, if necessary based on monitoring data;</li> <li>Ongoing monitoring of the Wonderfonteinspruit system, its water quality, wetlands (Wet-Health) and aquatic biota to detect changes that would occur as a result of the cessation of pumping activities. Sibanye will address impacts only directly associated with its activities and no other water users' activities, all findings will be communicated to the DWS to action further for other water users;</li> <li>Adopt remedial action if required if there is an overall reduction in ecological functionality of the system were possible;</li> </ul>	<ul style="list-style-type: none"> <li>Section 19 of the NWA (Prevention and remedying effects of pollution); and</li> <li>Section 2 of NEMA (Principles), subsection (4)(a)(ii) relating to the avoidance/ minimisation of pollution and degradation of the environment.</li> </ul>	Throughout Closure Phase

Activity	Aspect Affected	Potential Impact	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
		has experienced impacts from surrounding land uses.		<ul style="list-style-type: none"> <li>Monitor geomorphology of all systems for subsidence, erosion and incision; and</li> <li>Ongoing wetland rehabilitation is necessary both within and in the vicinity of the proposed decommissioning footprint areas and appropriate wetland monitoring techniques must take place on an annual basis during the summer/wet season in order to identify any emerging issues, trends or improvements in the receiving environment.</li> </ul>		
	Groundwater	Potential contamination of groundwater resulting from the interaction of water with the exposed rock and/ or any remaining sources of contamination in the underground workings.	Cooke No. 1, 2 and 3 ventilation shafts	<ul style="list-style-type: none"> <li>A detailed waste and hydrocarbon sources inventory of the underground workings must be kept. All waste and hydrocarbons must be removed from the underground workings as part of decommissioning and rehabilitation activities;</li> <li>The workings must be thoroughly inspected for any hydrocarbon spillages. If identified, this must be cleaned up prior to rewatering taking place;</li> <li>Hydrocarbon monitoring should be undertaken post-rewatering to ascertain the predicted water quality modelled. In the event that water is deemed to be a potential source of contamination, treatment measures must be investigated and implemented accordingly; and</li> <li>Sediments in the underground settler dams are not expected to be a source of contamination due to the lime dosing that takes place in the dams. Sediment quality should however be determined to ascertain this. In the event that it is deemed that the sediment may be a source of contamination the dams should be cleaned out and the sediments disposed of appropriately</li> </ul>	<ul style="list-style-type: none"> <li>Section 19 of the NWA (Prevention and remedying effects of pollution); and</li> <li>Section 2 of NEMA (Principles), subsection (4)(a)(ii) relating to the avoidance/ minimisation of pollution and degradation of the environment.</li> </ul>	Throughout Closure Phase
		Potential decant from the underground workings once rewatered.		<ul style="list-style-type: none"> <li>Although geochemical modelling does not expect the shafts to be potential sources of contamination (SRK, 2018) it remains essential that water in the shafts is contained as a precautionary measure (i.e. not allowing surface decant);</li> <li>Rewatering must be monitored to ascertain the hydrogeological modelling predications;</li> <li>The hydrogeological modelling should be updated as more information becomes available during rewatering to more accurately determine the possibility for decant;</li> <li>In the event that decant is expected, measures to cap the shafts must be investigated and implemented prior to the completion of rewatering; and</li> <li>Water quality must be monitoring within the underground workings, if deemed to be inappropriate treatment options must be considered accordingly.</li> </ul>		
5. General closure of the Cooke Underground Operations	Socio-economic	Job losses and ceased socio-economic contributions as a result of the closure.	Local	<ul style="list-style-type: none"> <li>Sibanye should ensure full participation of communities in the development of post closure socio-economic planning. This should include the following:</li> <li>Development of the stakeholder engagement plan for social closure planning to be shared with stakeholders;</li> <li>Where applicable, Sibanye should engage communities through existing Community Engagement Forums; and</li> <li>Full participation of Sibanye personnel) in stakeholder consultation process (including attendance of consultation meetings.</li> </ul>	<ul style="list-style-type: none"> <li>Section 41 of the MPRDA (Objectives of SLP), subsection (a) relating to the promotion of employment and advancement of social and economic welfare;</li> <li>Sibanye SLP and related policies; and</li> </ul>	Throughout Decommissioning, Rehabilitation and Closure Phases



Activity	Aspect Affected	Potential Impact	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
				<ul style="list-style-type: none"> <li>Sibanye should ensure full transparency and sharing of information with stakeholders;</li> <li>Sibanye to provide stakeholders with well researched feedback to unfeasible programs and Projects proposed by community members (including the use of locally based case studies); and</li> <li>Early formation of joint ventures and partnerships with stakeholders who will assist in the implementation of social closure programs.</li> </ul>	<ul style="list-style-type: none"> <li>Relevant local IDPs.</li> </ul>	
<b>Post-Closure Phase</b>						
1. Post Closure Monitoring/ Residual impacts	Groundwater	Contamination plume migration as a result of seepage from the Cooke TSF and associated Return Water Dams (RWDs) into the underlying aquifer.	Local	<ul style="list-style-type: none"> <li>The WRDs and mud ponds at the shaft complexes must be removed as planned;</li> <li>Sibanye must continue to investigate the possibility to reclaim the Cooke TSF; and</li> <li>Groundwater monitoring around the Cooke TSF must continue as part of the Cooke Surface Operations.</li> </ul>	<ul style="list-style-type: none"> <li>Section 19 of the NWA (Prevention and remedying effects of pollution); and</li> <li>Section 2 of NEMA (Principles), subsection (4)(a)(ii) relating to the avoidance/ minimisation of pollution and degradation of the environment; and</li> <li>Section 56 of the MPRDA (Principles of Closure), subsection (e) relating to the rehabilitation of land to its natural state or agreed stand which conforms with the concept of Sustainable Development</li> </ul>	Throughout Post-closure Phase and beyond
		Possible mine decant from the underground workings once fully rewatered.		<ul style="list-style-type: none"> <li>Rewatering should be monitored until groundwater levels in the shafts have fully recovered; and</li> <li>As more information becomes available, the numerical model should be updated as part of the post closure phase. This should be used to inform any additional mitigation measures.</li> </ul>		
		Potential contamination of groundwater (increase in suspended solids from subsidence event and potential underground pollution sources e.g. pipelines) in the event of sinkhole formation/ subsidence due to rewatering		<ul style="list-style-type: none"> <li>Subsidence monitoring must be undertaken until rewatering is complete; and</li> <li>Water quality monitoring must continue to be undertaken to detect any impacts which may be related to subsidence. If impacts are detected, corrective measures must be undertaken as soon as possible.</li> </ul>		
	Terrestrial Biodiversity; and Land use land capability	Unsuccessful rehabilitation resulting in, remaining sources of contamination and inadequate vegetation establishment.	Cooke No. 1, 2 and 3 shaft complexes	<ul style="list-style-type: none"> <li>The rehabilitated areas must be inspected for the successful re-establishment of vegetation;</li> <li>Follow-up amelioration and maintenance must be applied following the closure phase to avoid unsuccessful re-vegetation and potential erosion;</li> <li>Where vegetation is failing to establish an assessment must be undertaken by a qualified ecologist to determine practical corrective measures that can be implemented; and</li> <li>Where AIPs are identified, these must be removed as soon as possible.</li> </ul>		
Surface instability by in the event of sinkhole formation/ subsidence resulting in compromised ecological functionality and consequently	<ul style="list-style-type: none"> <li>Subsidence monitoring must be undertaken until rewatering is complete;</li> <li>In the event that subsidence occurs, corrective measures depending on the extent of the impact must be undertaken as soon as possible; and</li> <li>Ecological monitoring must be undertaken following the implementation of corrective measures to assess ecological functionality. Where adverse impacts persist, appropriate restoration measures must be investigated.</li> </ul>					

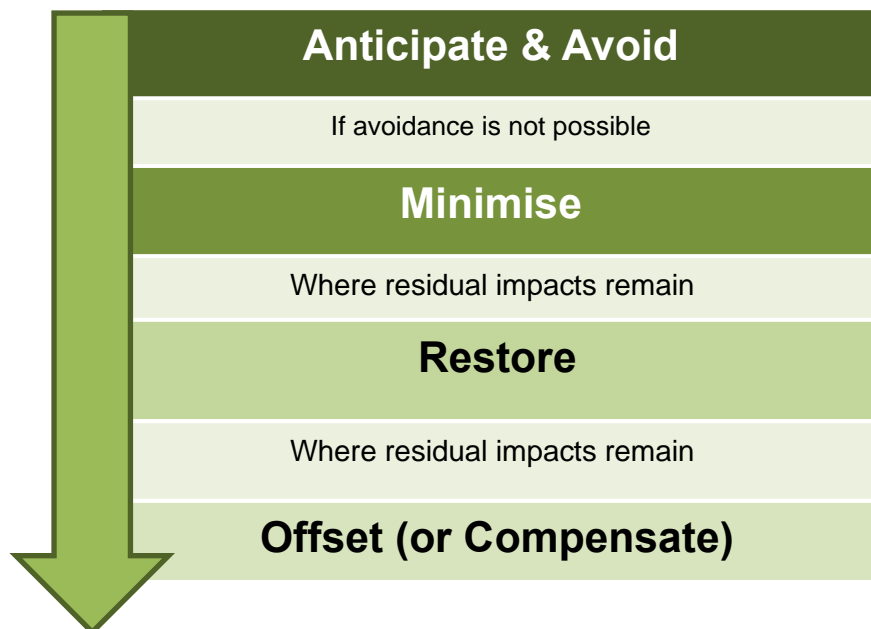
Activity	Aspect Affected	Potential Impact	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
		the post-mining land use in areas of subsidence/ sinkholes				
	Surface water resources; Wetlands; and Aquatic Biota	<p>Possible reduced ecological integrity of wetlands in proximity to rehabilitated areas if rehabilitation is unsuccessful, consequently resulting sedimentation caused by erosion on bare surfaces. Furthermore, deterioration of water quality in surrounding waterbodies could occur due to siltation. This may also consequently result in the loss/ deterred sensitive aquatic biota in immediate reaches affected.</p> <p>Potential collection of surface water runoff in areas of possible subsidence/ sinkholes. This will reduce amount of water reporting to surrounding surface water features (incl. wetlands) and consequently may affect aquatic biota.</p>	Local	<ul style="list-style-type: none"> <li>Surface water quality, wetland and biomonitoring must be undertaken to detect impacts; and</li> <li>If impacts are detected, appropriate corrective measures must be investigated and implemented accordingly.</li> </ul>	<ul style="list-style-type: none"> <li>Section 19 of the NWA (Prevention and remedying effects of pollution); and</li> <li>Section 2 of NEMA (Principles), subsection (4)(a)(ii) relating to the avoidance/ minimisation of pollution and degradation of the environment; and</li> <li>Section 56 of the MPRDA (Principles of Closure), subsection (e) relating to the rehabilitation of land to its natural state or agreed stand which conforms with the concept of Sustainable Development</li> </ul>	Throughout Post-closure Phase and beyond
	Socio-economic	In the event that unidentified infrastructure remains in the rehabilitated areas there is a higher risk of invasion of areas and consequent damage to rehabilitated footprints.	Cooke No. 1, 2 and 3 shaft complexes	<ul style="list-style-type: none"> <li>During the post-closure phase the property must be inspected to identify areas where unknown buried pipelines may have been stolen, any illegal re-opening of holings and/or identify unknown holings; and</li> <li>If this is identified the trenches of the pipeline(s) and/or the holing must be appropriately sealed and the surroundings appropriately rehabilitated as soon as possible.</li> </ul>	<ul style="list-style-type: none"> <li>Section 56 of the MPRDA (Principles of Closure), subsection (e) relating to the rehabilitation of land to its natural state or agreed stand which conforms with the concept of Sustainable Development</li> </ul>	Throughout Post-closure Phase and beyond

## 7 Impact Management Outcomes

Please refer to the CEMPr in Section 6 above which provide the activities, identified potential impacts and mitigation measures determined to avoid/ minimise adverse impacts, or in the case of positive enhance these impacts.

The overarching objective of the CEMPr is to provide practical environmental and socio-economic management tools to achieve sustainable closure and prevent long-term environmental and social liabilities. This is not only limited to the proposed decommissioning, rehabilitation and closure activities proposed but also aimed to reduce the likelihood for residual and/or latent impacts to be realised.

In line with best practice, the mitigation hierarchy was used in the process of determining practical mitigation measures, as shown in the figure below.



**Figure 7-1: The Mitigation Hierarchy**

Adapted from the International Finance Corporation Performance Standard 1

## 8 Impact Management Actions

Refer to the CEMPr in Section 6 above which provide the activities, identified potential impacts and mitigation measures determined to avoid/ minimise adverse impacts, or in the case of positive enhance these impacts. The applicable regulatory standards against which the mitigation measures were determined are also include in the CEMPr.

## 9 Financial Provision

### 9.1 Determination of the Amount of Financial Provision

#### 9.1.1 Describe the Closure Objectives and the Extent to which they have been Aligned to the Baseline Environment described under the Regulation

The rehabilitation and closure objectives have been set out in Section 5.1 above. The overarching objective for closure is to ensure that impacted land is rehabilitated in a manner that allows it to be ceded for other sustainable land uses.

#### 9.1.2 Confirm Specifically that the Environmental Objectives in relation to Closure have been Consulted with Landowner and Interested and Affected Parties

A Decommissioning, Rehabilitation and Closure Plan as compiled for closure requirements evaluated in 2019 has been compiled for the Cooke Underground Operations. This plan provides a preliminary assessment of closure requirements, which will be refined pending approval of this environmental regulatory process and thereafter, with the progression on implementation of decommissioning, rehabilitation and closure activities.

The plan is appended to the BAR (Part A) as Appendix J, and is being made available to stakeholders together with the BAR and CEMPr for public review and commenting.

#### 9.1.3 Provide a Rehabilitation Plan that Describes and Shows the Scale and Aerial Extent of the Main Mining Activities, including the Anticipated Mining Area at the Time of Closure

This Application pertains to decommissioning, rehabilitation and closure activities. Therefore all activities proposed and assessed as well as the outcomes of the CEMPr in Section 6 provide the Rehabilitation Plan for the Cooke Underground Operations.

#### 9.1.4 Explain why it can be Confirmed that the Rehabilitation Plan is Compatible with the Closure Objectives

The Decommissioning, Rehabilitation and Mine Closure Plan, (appended to the BAR as Appendix J), has been developed against the closure objectives which Sibanye now intends to implement for the Cooke Underground Operations. All activities proposed and assessed in the BAR and this CEMPr are aimed at achieving these closure objectives.

### **9.1.5 Calculate and State the Quantum of the Financial Provision required to Manage and Rehabilitate the Environment in accordance with the Applicable Guideline**

Please refer to Section 19 of the BAR (Part A) for a breakdown of the calculated Closure Cost. The costing (considered scheduled and unscheduled closure) which were calculated at **R 335 million and R 423 million**, respectively.

### **9.1.6 Confirm that the Financial Provision will be Provided as Determined**

The Financial Provision will be provided as legally required. Sibanye contributes annually in the form of financial guarantees for its operations. The determined costs will be assessed annually as part of the Annual Rehabilitation Plan update until the issuance of a Closure Certificate.

## **10 Monitoring Compliance and Performance Assessment**

### **10.1 Monitoring of Impact Management Actions**

Sibanye will be responsible for the implementation of all monitoring, mitigation and management measures, as well as compliance with the CEMPr. An extensive environmental and social monitoring programme is existing for both the Cooke Surface- and Underground Operations which will remain applicable until such a time as this CEMPr is approved and being implemented. It should be noted that the Surface Operations will continue to operate under the existing approved EMPPr addendums.

A rehabilitation and closure specific monitoring plan has been developed, specifically for the activities assessed in this CEMPr. This monitoring programme is detailed in Table 10-1.

### **10.2 Monitoring and Reporting Frequency**

Table 10-1, below, discusses the monitoring and reporting frequency in detail for each aspect of monitoring.

### **10.3 Responsible Persons**

The roles and responsibilities associated with each aspect of monitoring programme are set out in Table 10-1, below.

### **10.4 Time Period for Implementing Impact Management Actions**

Table 10-1, below, captures the time period for implementing impact management actions.



## 10.5 Mechanism for Monitoring Compliance

Table 10-1 sets out the monitoring and management programme of environmental and socio-economic impacts for the project. Note: with the refinement of the Decommissioning, Rehabilitation and Mine Closure Plan the monitoring programme may also be refined based on the progression of activities.

**Table 10-1: Monitoring Programme for the Proposed Decommissioning, Rehabilitation and Closure Activities**

Source Activity	Aspects requiring monitoring	Functional requirements for monitoring	Roles and responsibilities	Monitoring and reporting frequency
All decommissioning and rehabilitation activities	Flora and Fauna	Vegetation establishment at the shaft complexes and along pipeline routes where infrastructure is removed must be monitored following rehabilitation activities. During the decommissioning and rehabilitation phases, no unnecessary additional disturbance must take place and this too should be monitored.	Environmental Specialist/ ECO	• Monthly
		The encroachment of AIPs once disturbed areas (shaft complexes and pipeline routes) have been rehabilitated must be monitored within the project area on a quarterly basis and appropriate corrective measures must be undertaken where infestation is observed.	Environmental Specialist/ ECO	• Monthly
		Annual monitoring of general biodiversity restoration during the post-closure phase must be undertaken to ensure sustainable populations of both fauna and flora persist. This includes impacts on vegetation structure and health; impacts on faunal populations and numbers; and Red Data Listed fauna and flora species as applicable.	Terrestrial Ecologist	• Annually
	Soil erosion	Disturbed areas (shaft complexes and pipeline routes) should be inspected for soil erosion following the removal of infrastructure and throughout the rehabilitation phase. Where soil erosion is observed, mitigation measures must be implemented accordingly.	Environmental Specialist/ ECO	• Monthly
	Surface water quality	Water quality must continue to be monitored as per the established approved monitoring programme (Plan 13 of the BAR (Part A)) on a monthly basis until the issuance of the Closure Certificate. The results should be benchmarked against the limits set in the IWUL.	Environmental Specialist/ ECO	• Monthly
	Surface water quantity	The recovery of Magazine Pan should be monitored during the closure and post-closure phases to better understand the significance of the potential drying up of portions of the pan due to cessation of discharge of mine effluent into the pan.	Environmental Specialist/ ECO	• Monthly
	Groundwater	<p>Groundwater quality must continue to be monitored as per the established approved monitoring programme (Plan 14 of the BAR (Part A)) on a quarterly basis until the issuance of a Closure Certificate. The results should be benchmarked against the limits set in the IWUL. Additional boreholes are recommended to be included into the groundwater monitoring network to monitor:</p> <ul style="list-style-type: none"> <li>• Groundwater levels at strategic points in the Zuurbekom West Compartment; and</li> <li>• Groundwater quality down-gradient from the potential contaminant sources (including shafts) to monitor potential contaminant migration and sub-surface mine water decant after closure.</li> </ul> <p>Six additional boreholes have been recommended (as shown in the Hydrogeology Study, appended to the BAR as Appendix E) against the following rationale:</p> <ul style="list-style-type: none"> <li>• BH 1: Monitor water level and groundwater quality at Cooke 1 shaft, as well as the potential impact from the waste rock footprint and mud ponds;</li> <li>• BH 2: Monitor water level and groundwater quality at Cooke 2 shaft, as well as the potential impact from the disturbed area on the southern side of the shaft;</li> <li>• BH 3: Monitor water level in the Zuurbekom East Compartment and the groundwater quality in the vicinity of Magazine Pan;</li> <li>• BH 4: Monitor the groundwater level in the vicinity of Donaldson Dam, where a drop in groundwater level is currently noticeable;</li> <li>• BH 5: Monitor water level and groundwater quality at Cooke 3 shaft and waste rock footprint; and</li> <li>• BH 6: Monitoring between the Cooke TSF and the Wonderfonteinspruit.</li> </ul>	Environmental Specialist/ ECO	• Quarterly

Source Activity	Aspects requiring monitoring	Functional requirements for monitoring	Roles and responsibilities	Monitoring and reporting frequency
	Wetlands	<p>All wetland HGM units delineated must be monitored on a monthly basis during the decommissioning phase to detect any negative impacts that may occur. Vegetation is an indicator of wetland health and can be used to monitor the decline in the wetland functionality. Furthermore, other impacts which should be observed include erosion, sedimentation, hydrocarbon spills, AIPs infestation etc. Where impacts are occurring, corrective measures and follow-up monitoring must be implemented accordingly.</p> <p>Following rehabilitation activities, biannual biomonitoring is recommended in appropriate watercourses until the issuance of a Closure Certificate. Due to the possible shrinkage impact identified for the Magazine Pan as a result of the cessation of discharge of treated effluent, the recovery of the pan should be monitored during the closure and post-closure phases. This will lead to a better understanding of the significance of the potential drying up of portions of the pan.</p>	Qualified Wetland Ecologist	<ul style="list-style-type: none"> <li>Monthly (during decommissioning phase);</li> <li>Annual biomonitoring (during rehabilitation, closure and post-closure phases); and</li> <li>Monthly monitoring of Magazine Pan (during post closure phase).</li> </ul>
	Aquatic Ecology	<p>Bi-annual aquatic monitoring must be undertaken as per the current approved monitoring programme. This programme should include the following aspects:</p> <ul style="list-style-type: none"> <li>Water Quality;</li> <li>Habitat Quality; and</li> <li>Macroinvertebrate assemblages.</li> </ul>	Qualified Aquatic Ecologist	<ul style="list-style-type: none"> <li>Bi-annually</li> </ul>
	Use of hydrocarbons	<p>Inspections of machinery must be undertaken and spill trays will be placed under the machinery to collect any hydrocarbon leaks and spillages in the event it is required. Should spillages occur, the soil must be cleared and treated utilising bioremediation techniques. Should the soil not be adequately treated on site, the soil must be removed from the sites and disposed of at a waste handling facility.</p>	Environmental Specialist/ ECO	<ul style="list-style-type: none"> <li>Continuously, dependent on likelihood of spillage (i.e. while undertaking activities where hydrocarbon spillages may occur);</li> <li>Monthly generally monitoring by ECO</li> </ul>
	Ablution facilities	<p>Ablution facilities used in the project areas must be inspected for spillages on a weekly basis.</p>	Environmental Specialist/ ECO	<ul style="list-style-type: none"> <li>Weekly</li> </ul>
	Domestic waste	<p>Bins must be placed at various places around the project areas to collect the domestic waste and must be disposed of at a registered waste handling facility. These bins must be inspected weekly for spillages.</p>	Environmental Specialist/ ECO	<ul style="list-style-type: none"> <li>Weekly</li> </ul>

## **11 Indicate the Frequency of the Submission of the Performance Assessment/ Environmental Audit Report**

In accordance with the EIA Regulations, 2014 (as amended) an external independent Environmental Audit will be undertaken every two years. The Environmental Audit Report will be submitted to the DMRE and other relevant authorities where required.

## **12 Environmental Awareness Plan**

### **12.1 Manner in which the Applicant Intends to Inform his or her Employees of any Environmental Risk which may Result from their Work**

The purpose of an Environmental Awareness Plan is to outline the methodology that will be used to inform employees of any environmental risks which may result from their work and the manner in which the risks must be dealt with to avoid contamination or the degradation of the environment.

The environmental awareness plan is primarily a tool to introduce and describe the requirements of the range of environmental and social plans for the proposed project during the life of the project.

The environmental awareness plan ensures that training needs are identified and appropriate training is provided. The environmental awareness plan should communicate:

- Importance of conformance with the environmental policy, procedures and other requirements of good environmental management;
- The significant environmental impacts and risks of an individual's work activities and the environmental benefits of improved performance;
- Individual's roles and responsibilities in achieving the aims and objectives of the environmental policy; and
- The potential consequences of not complying with environmental procedures.

The objective of this Environmental Awareness Plan is to:

- Inform employees and contractors of any environmental risks which may result from their work; and
- Inform employees and contractors of the manner in which the identified possible risks must be dealt with to prevent degradation of the environment.

In general, the purpose of implementing an Environmental Awareness Plan is to optimise the awareness of those partaking in all project activities which have the potential to impact negatively on the environment and in doing so, promote the global goal of sustainable development.

Sibanye has established methods of environmental awareness training of its employees and contractors. Health, Safety and Environmental training will be carried out and applicable for all personnel partaking in the project as well as any other activities to achieve the objectives set out above.

## 12.2 Manner in which Risks will be Dealt with in Order to Avoid Pollution or the Degradation of the Environment

Risks that may result in pollution or the degradation of the environment have been identified and included in this CEMPr.


## 13 Specific Information Required by the Competent Authority

The financial provision for the environmental rehabilitation and closure requirements of mining operations is governed by NEMA, as amended, which provides in Section 24P that the holder of a mining right must make financial provision for rehabilitation of negative environmental impacts. The financial provision has been determined and will be reviewed annually.

## 14 Undertaking

The EAP herewith confirms:-

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

<b>Signature of the Environmental Assessment Practitioner:</b>	
<b>Name of Company:</b>	Digby Wells and Associates (South Africa) (Pty) Ltd
<b>Date:</b>	October 2020