REPORT

SIBANYE-STILLWATER

Determination of the 2018 Closure Costs for Ezulwini Mine

Submitted to:

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1896352-325721-6_Revision 1

12 April 2019

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1.0 INTRODUCTION

Sibanye Gold Limited, a subsidiary of Sibanye-Stillwater (Sibanye) is the largest gold producer in South Africa. Their gold mining operations includes the Ezulwini mine situated in the southwest Gauteng Province – refer to Figure 1 for the location of Ezulwini in relation to Sibanye's adjacent Cooke and Rand Uranium Surface Operations (RUSO) mines. The mine is owned and operated by an independent company, namely Ezulwini Mining Co (Pty) Ltd (EMC).

Regulations in terms of the National Environmental Management Act (Act 107 of 1998), pertaining to the Financial Provisioning for Prospecting, Exploration, Mining or Production Operations, were promulgated on 20 November 2015 (GN R. 1147). Golder Associates (Golder) was commissioned by Sibanye to align the closure planning and associated costs for all of its gold and platinum operations with the requirements of GN R. 1147, for submission to the Department of Mineral Resources (DMR). Given the substantial amount of work needed to achieve compliance with GN R. 1147 for all of Sibanye's mining operations, this process has been ongoing since 2016 and will be completed before the newly extended compliance date of February 2020.

This report provides the unscheduled and scheduled closure costs for the Ezulwini gold mining operations, computed as at December 2018.

2.0 PROJECT BACKGROUND

2.1 Current closure planning context

Sibanye is committed to reducing the closure liability of each of its operations on an ongoing basis, throughout their remaining operational lifespans. To this end, Sibanye has been systematically identifying surface sources of water contamination and areas affected by legacy mining activities, in order to remediate and mitigate these, through a process called "Project Rescue". Accordingly, provision is also being made in the closure costs to implement these remedial and mitigation activities, where these have been finalised. Additionally, ongoing work is being conducted to understand the long-term mine water situation for the entire Sibanye Westrand gold mining complex, in order to develop an integrated, realistic and appropriate mine water management strategy for all of its operations, which would include post-closure water management aspects.

Mining at Ezulwini has already ceased and only the processing plant is still operating, with the shaft complex scheduled for demolition in the near future. Ezulwini is therefore expected to be the first of the Sibanye Westrand mines to close, following which groundwater pumping will cease and re-watering of the underground mine workings will systematically occur. The rebounding water table will eventually decant on surface in approximately seven years (from when pumping ceases), at the Gemsbokfontein Eye (Jones & Wagener, 2017a).

All current indications are that the decant water will be clean, as the underground water in the workings is expected to stratify prior to decant, with the heavier, contaminated water settling in the lower workings. Clean recharge water is expected to flow into and exit the workings without any notable mixing with the dirty water, therefore leaving the workings as clean decant (Jones & Wagener, 2017a).

For the 2018 closure costs update, the unscheduled closure of Ezulwini was therefore approached from the perspective of the mine closing as a "stand-alone" operation and hence from a post-closure water management perspective. The sequential objectives of the costed closure measures in this regard are therefore as follows:

- Mitigate surface sources of water contamination, and rehabilitate affected watercourses to the extent possible during the remaining operational period, and thereafter during the subsequent closure plan implementation phase;

- Conduct rehabilitation monitoring and aftercare to ensure that closure objectives and criteria are met, as well as surface- and groundwater quality monitoring during the pre-closure phase to recalibrate the groundwater model as required;
- Conduct subsidence monitoring during and after the underground workings re-watering period and implement corrective measures if and where required; and
- Continue with surface- and groundwater quality monitoring after closure, to ensure that expected water quality realises, and to address any deviations from anticipated outcome should these occur.

It is noted that Sibanye's gold mining operations in the region will continue for approximately two more decades, and Sibanye will therefore have the ability to intervene and address/manage post-closure aspects if and when these occur. Furthermore, a more comprehensive approach in terms of the post-closure mine water management for all of Sibanye's Westrand gold mines is also being developed as part of Project Rescue, and that further provision will be made in the respective closure costs of each mine as required to implement this strategy, once development thereof is finalised.

In the context of Ezulwini, this could amongst others entail the following:

- Developing a more detailed decant management strategy, to ensure that the decant runoff into the receiving environment is done in an ecologically safe and sustainable manner;
- Conducting wetland biomonitoring and aquatics monitoring to ensure that the mine water discharge/decant does not adversely impact the receiving waterbodies and aquatic habitats;
- Developing a photographic record of the occurrence of existing cracks in structures within the immediate vicinity of the mining operations; and
- Performing regular sinkhole and subsidence monitoring, and damage repair when required.

2.2 Next land use context

The following preliminary land use objectives have been identified for Ezulwini:

To progressively reinstate a post-mining landscape over time, as the relevant areas become available for this purpose, that:

- *Where possible, reinstate sustainable agricultural activity as required by the relevant environmental management plans (EMPs) that supports surrounding agricultural land uses;*
- *Where feasible, makes land available for future residential development, and other economic activities;*
- *Maintains, protects and where possible reinstates essential ecosystem services; and*
- *Improves the long-term spatial land use patterns and aesthetic appearance of the site.*

Aligned to the above, a number of preliminary next land uses have been identified for the rehabilitated and closure for the mine, namely:

- Planted pasture for grazing (arable, un-impacted areas, rehabilitated infrastructure footprint areas) on areas not suitable for cropping;
- Dryland crop production on rehabilitated infrastructure and mining facilities footprints;
- Reinstating functionality of impacted ecological areas, and protection of existing conservation important areas including ridges and watercourses;

- Selected infrastructure transfer to support targeted redevelopment;
- Lower income and “gap” housing development adjacent to existing residential areas;
- Commercial and/or light industrial redevelopment of key plant and infrastructure areas; and
- Continuation of existing crop production, as well as continued existence of developed areas and other commercial activities within non-mining parts of the MR, as well as existing small-scale tourism and accommodation activities.

It is noted that these land uses are indicative and of a preliminary nature only, based on current land use patterns and indicators as well as the requirements included in the respective mining area Environmental Management Plans (EMPs). These will be explored in more detail during subsequent phases of the ongoing mine closure planning process and should also be revised as part of regular mine planning updates.

Furthermore, the closure approaches and specific mitigation measures identified in this report are only aimed at leaving behind a rehabilitated mine site that can eventually receive/accommodate the envisaged post-mining land uses. However, implementation of these measures may not necessarily translate into the next land use being implemented/achieved, as this will be dependent on further third-party intervention and management.

2.3 Mining Rights

The Ezulwini mining right (GP 38 MR), is located directly south of the N12 and east of the R21 extension, south of the Cooke operations.

The Ezulwini mining right area is shown on Figure 2.

2.4 Life-of-mine

The current surface life-of-mine for Ezulwini is until 2027 but the underground operations are in care and maintenance, and the complex is expected to be decommissioned and closed before this date. The mining right expires in 2036.

2.5 Battery limits

The battery limits that applied to the 2018 closure costs for Ezulwini are as reflected in Table 1 and Figure 1:

Table 1: Ezulwini closure costing battery limits

Ezulwini Mine	
■ Shaft area ■ Gold and Uranium Plant ■ Old salvage yard ■ Hostel area ■ Explosive magazine ■ Old waste rock dump area ■ Borrow pit ■ Calcine dump ■ Domestic dump	■ Fish Dam ■ Tailings storage facility (TSF) ■ Mud ponds ■ Water treatment plant ■ HDPE pipelines ■ Peter Wright Dam ■ Black wattle area ■ Zama Zama area ■ Disturbed areas between the plant and Peter Wright dam

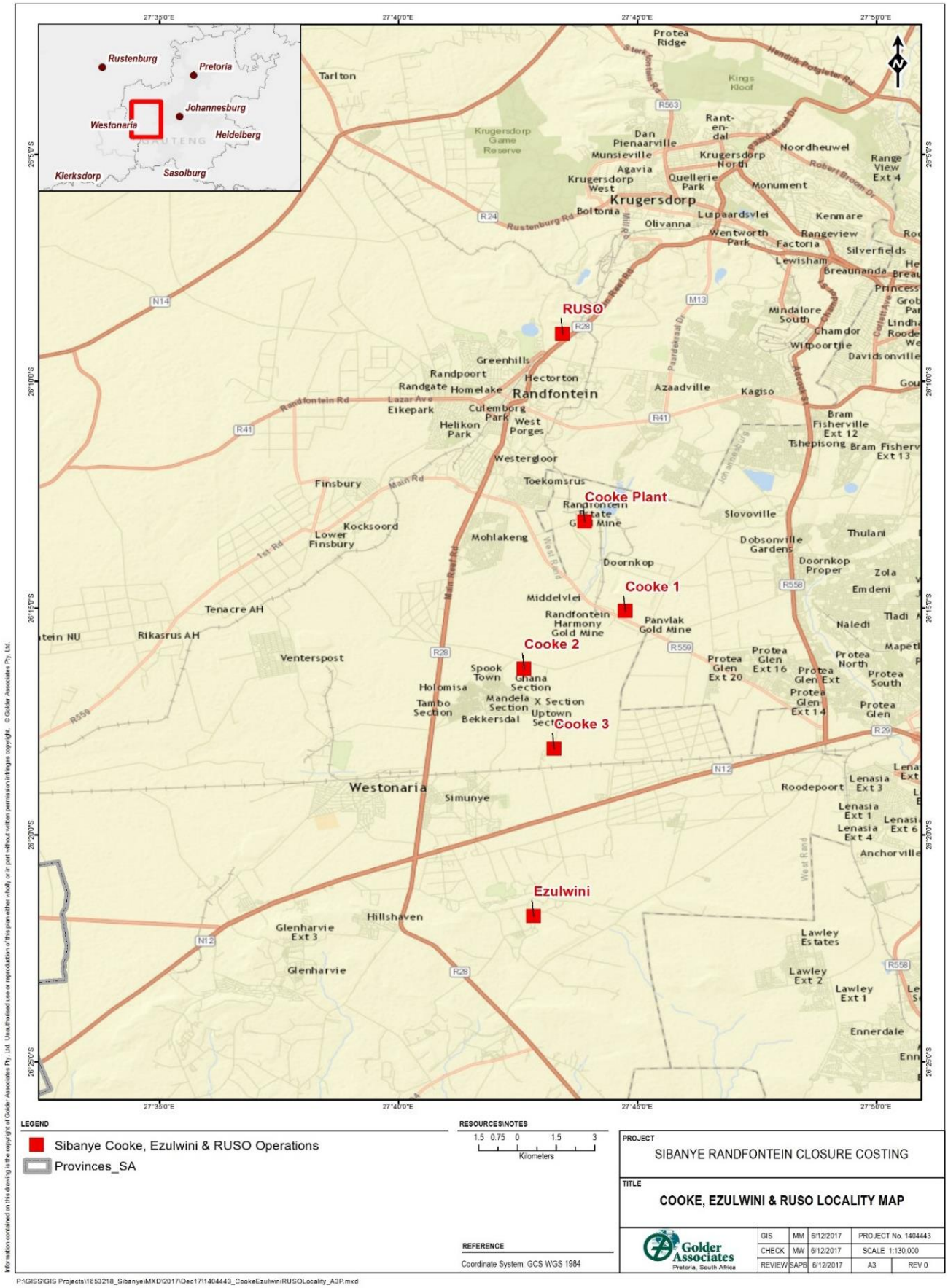

Figure 1: Location of the Ezulwini operations

2.6 Key environmental aspects

The area covered by the Cooke, RUSO and Ezulwini mining operations is expansive and comprises two minerals processing plant complexes, four shafts complexes, support infrastructure and residential complexes, a number of open pits, as well as several tailings storage facilities (TSFs) and numerous overburden and waste rock dumps (WRDs), located in different parts throughout the respective MRs. The remaining areas between the mining operations include sections of built-up urban residential that extend into the borders of the RUSO and Cooke MRs, and a patchwork of stands of invasive trees and areas transformed by historical mining activities, informal grazing areas and limited dryland cropping areas in the Ezulwini MR, as well as agricultural smallholdings. The remaining areas of ecological significance are localised and mainly correspond with the watercourses that transect the respective MRs, most of which are already notably degraded.

The larger region is similar in nature, with the levels of development gradually reducing from north to south, with the area south of Ezulwini being dominated by dryland crop production and grazing. The majority of the areas to the west and especially east of the combine MRs are characterised by expansive urban development, and mining activities by other parties also occur directly to the north, east and southwest. The Sibanye Kloof and Driefontein mining operations are located further west of the RUSO/Cooke/Ezulwini operations.

The economy in the vicinity of these mines is diversified, with the mining, agriculture, manufacturing / industrial, development and tertiary sectors all playing prominent roles in the development of the region. Many of the peripheral middle- and lower-income residential precincts associated with the larger towns to the north, east and west of the MR area are steadily expanding, with the need for developable land along the outskirts of these settled areas expected to persist. However, land use patterns further to the south are not expected to materially change for the foreseeable future.

The existing land cover, most important watercourses and roads within the Ezulwini mining right and surrounding areas are illustrated by Figure 2.

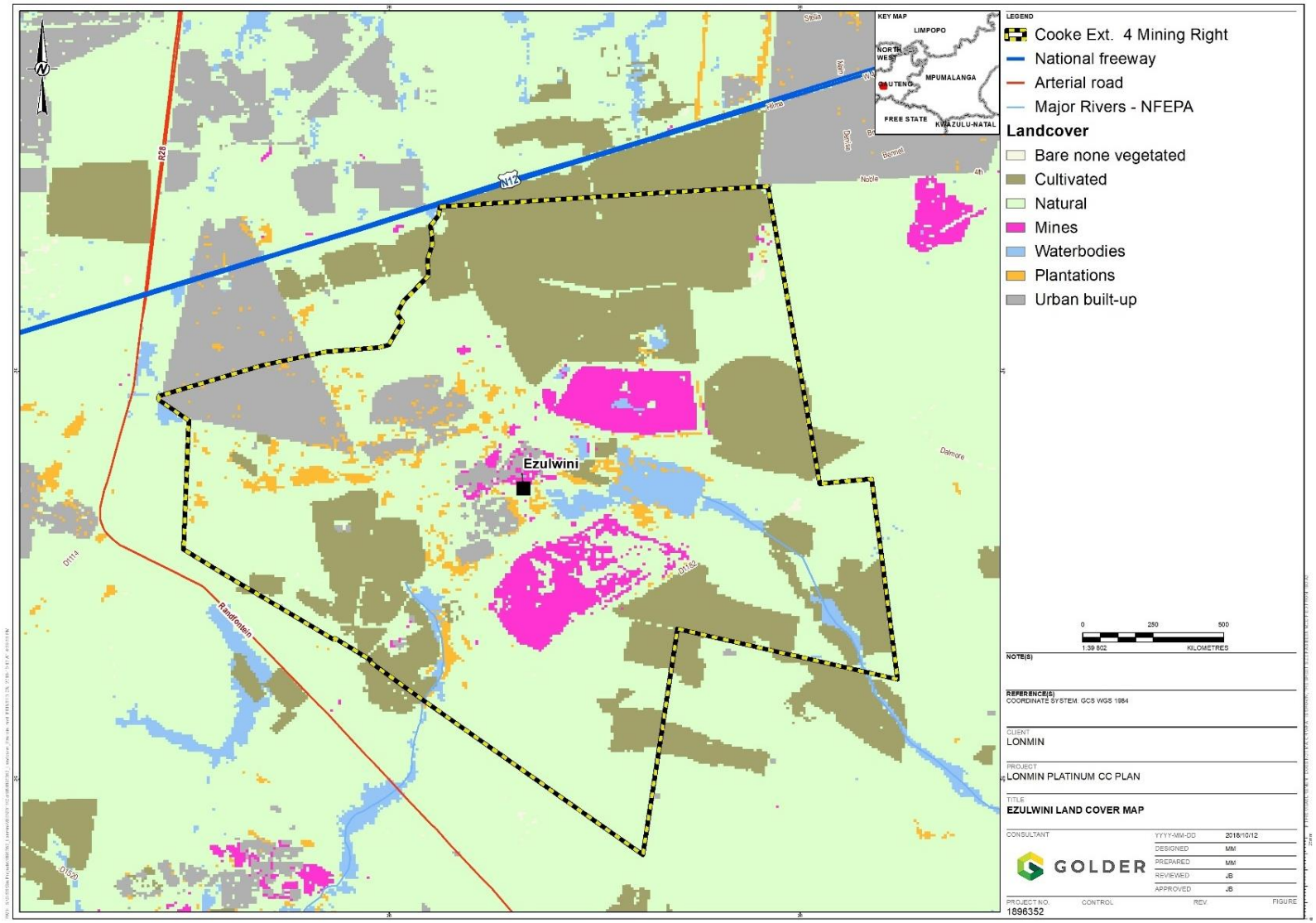

Figure 2: Ezulwini mining right and existing land cover and uses surrounding the mining area

3.0 PROJECT OBJECTIVES

This report provides the unscheduled and scheduled closure costs for the Ezulwini gold mining operations computed as at December 2018.

4.0 APPROACH AND METHODOLOGY

This section describes the approach and methodology followed with the execution of the 2018 closure costs update for Ezulwini. Key aspects and assumptions that directly influenced the closure costs are documented under Section 5.0 and have been costed as per the measures described in Section 6.0.

The following key actions were completed as part of the 2018 closure costs review and update for Ezulwini:

- Transfer the previous (2017) closure costs for Ezulwini from the previous closure costing spreadsheet format to the Golder GN R. 1147-aligned spreadsheet template;
- Gather initial background information to inform the 2018 closure planning and costing update during March 2018, notably the properties assessment and infrastructure inventories;
- Submit an initial technical scope of works and costs proposal to conduct the 2018 closure planning and associated costs update for the Sibanye gold mining operations, including Ezulwini (dated 15 March 2018). Revise / update and finalise the aforementioned proposal following a number of specific scope clarifications, and submit as revision 2, dated 11 June;
- Conduct an initial closure-related risk identification workshop with various Sibanye technical and operational representatives from the various gold mining operations on 23 May, at Sibanye's Libanon office park (Libanon), to:
  - Establish which risks may potentially have associated residual management requirements once appropriate and feasible closure measures have been implemented, and which will require additional management/mitigation after site relinquishment/closure. In this regard, residual impacts are therefore defined as environmental impacts that are expected to manifest after mine closure, once the relevant, reasonable "routine" closure measures as defined in the closure plan have already been implemented. These impacts can typically be anticipated with a reasonable degree of accuracy in terms of their likely occurrence, extent, magnitude as well as duration, through predictive modelling or other scientific methods. An example of this would be the possible formation of sinkholes due to the re-watering of the underground mine workings, which can be monitored and remediated as needed;
  - Identify and contextualise the key risks that need to be taken forward into site-specific risk assessments for each operation, and
  - Identify specific information required to inform this process.
- Conduct a project kick-off meeting with Sibanye and KPMG on 26 June 2018, to discuss and agree on the project execution strategy to be used for the 2018 closure costs, as well as key technical and quality control aspects to be addressed, as documented in the minutes of that meeting;
- Telephonically discuss the intended Ezulwini site visit itinerary with key Sibanye personnel to identify focus areas for the site visit; and subsequently undertake a site visit Ezulwini mining operations on 12 July 2018 together with Mr. Rob Gilmour from Sibanye. It is noted that no significant changes were noted at Ezulwini complex since the 2017 site visits was conducted;

- Based on information received, compile an inventory of outstanding information required for all gold mining operations dated 07 August 2018, and submit this to the technical and operational personnel of the relevant operations;
- Conduct a set of one-on-one follow-up workshops with the relevant Sibanye technical and operational representatives from the various gold mining operations on 17 August at Libanon, to
  - Identify specific technical aspects that need to be addressed in the 2018 closure costs update; and
  - Identify further specific information requirements pertaining to the above.
- Conduct a meeting with Johan Wagener on 20 August at the Golder Pretoria offices, regarding the long-term / post closure water management for the various gold mines, including:
  - Summary of the status quo and likely future scenarios for Ezulwini, based on current information; and
  - Work currently being conducted, and further requirements to better understand and plan the long-term mine water management requirements for Ezulwini.
- Conduct a project status-quo update with Grant Stuart and Tharina Naude of Sibanye on 23 August 2018 at Libanon, to obtain clarity and in-principle agreement on a number of matters relating to the following key focus areas:
  - Potential third-party infrastructure transfer;
  - Long term and post-closure mine water management requirements and associated inclusions in the 2018 closure costs; and
  - General matters pertaining to the “packaging” and reporting structure of the closure cost spreadsheets.
- Obtain additional background information requested during the meetings held in August 2018, needed to inform the 2018 closure costs update;
- Compile a technical memorandum outlining the approach and methodology applied with the above closure planning and costing, as well as key assumptions that underpin the development and/or review and update of the detailed closure measures for the various mining-related infrastructure and operational areas;
- Conduct an assessment and summary of the closure commitments/legal obligations in the existing Ezulwini environmental related authorisations and supporting documentation, as well as other relevant contractual agreements/documentation provided by Sibanye;
- Review the previous closure costing unit rates and benchmark these against industry rates, through consultation with demolition contractors and rehabilitation practitioners, notably Jet Demolition, Entlearolo Trading and others;
- Update the individual surface plant, buildings and other infrastructure line items in the closure costs spreadsheets with the latest available infrastructure inventories conducted by Umhlaba Consulting, based on the following:
  - Individual item identification numbers and accompanying geographic locations (Google Earth .kmz files);
  - Descriptions of individual infrastructure including materials and accompanying photos, and

  - Specified infrastructure heights and footprint areas.

- Verify and if needed update the closure costing battery limits, based on the outcomes of the document review and verification of the mining right boundary using GIS and the boundary co-ordinates provided in the EMP/Mining Licence documentation;
- Compile a technical memorandum summarising the closure visions for Ezulwini, as well as closure objectives and individual measures relevant to the different plant, mining and other operational-related disturbance areas, to inform the 2018 closure costs update;
- Confirm, re-measure and/or update the specific quantities for the TSF i.e. shaping, levelling, covering and/or revegetating of the dumps and/or remaining footprint areas, as the case may be, based on the latest 2018 information provided by Sibanye, as well as utilising the latest LIDAR information to derive other quantities where possible;
- Update the quantities and/or allowances for other aspects or areas that have changed since the 2017 closure costs update was completed, based on the available information and site observations;
- Adjust sum allowances for preliminaries and general items as well as contingencies, based on current industry indicators/trends;
- Review and update allowances for specific specialist studies and other assessments as applicable;
- Review and update the specific provisions for post-closure monitoring and aftercare-related matters;
- Update and include additional narratives for the assumptions and qualifications made for each cost item based on the above;
- Conduct a workshop session with Sibanye on the working draft of the costs, to identify the most notable changes and to rationalise these and effect any revisions as needed, and subsequently submit the draft closure costs to Sibanye for review;
- Incorporate review comments received from Sibanye into the final closure costs and submit to KPMG;
- Compile and submit a summary closure costing report to Sibanye and KPMG; and
- Further revise the closure costs based on the subsequent further review conducted by Sibanye and KPMG respectively, and submit the revised closure costs and this revised summary closure costing report for sign-off.

Following the above, the following actions were also taken in 2019:

- Review the Final Basic Assessment Report and Environmental Management Programme Report Cessation of Pumping Operations at Ezulwini and Closure of Underground Mine Workings (Jones & Wagener, 2017b), Partial Closure Geohydrological and Geotechnical Assessment Final Report (Jones & Wagener, 2017a) and associated Dolomite Risk Management Strategy (Jones & Wagener, 2017c);
- Submit the Ezulwini closure costs report and spreadsheet to Jones & Wagener, to conduct a technical peer review;
- Hold a meeting at the Jones & Wagener Johannesburg offices on 9 April 2019 to discuss their initial review comments;
- Submit a subsequent draft update of the closure costs to Jones & Wagener and Sibanye on 10 April for further review; and

- Revise and finalise the closure costs and report for submission to the DMR.

5.0 KEY ASPECTS AND ASSUMPTIONS

The following section describes a number of key assumptions that guided the 2018 closure costs update for Ezulwini mine. Focus is placed on site-specific and newly resolved matters and changes since the previous closure costs update. “Routine” assumptions or widely applied industry standards that have already been established in the previous closure costs were therefore not comprehensively captured.

Key aspects are presented in terms of the general closure costing context, as well as specific considerations in terms of the respective headings / cost categories of the closure costing spreadsheets. The listed assumptions relate specifically to unscheduled closure (although the approach assumption may also be relevant to scheduled closure), unless specifically stated otherwise as included for contextual clarity.

5.1 General matters

- The overall closure costs for the site will comprise a number of cost components. The closure costs only address surface rehabilitation, decommissioning of infrastructure and the final closure and control of the site that will ensure attainment of the predetermined post mining land use with acceptable environmental and socio-economic effects. This equates to outside (third party) contractors establishing on site and conducting the suite of closure related work, ranging from initial infrastructure demolition and surface rehabilitation, to the monitoring/control and corrective action to ensure the desired rehabilitation related outcomes. Other components of the overall costs such as staffing of the site after decommissioning, the infrastructure and support services (e.g. power supply, etc.) for this staff as well as workforce matters such as separation packages, re-training /re-skilling, etc. will not be considered in the closure costs assessment;
- Based on the above, dedicated contractors would be commissioned to conduct the surface rehabilitation, demolition and closure related work on the site. This would inter alia require establishment costs for the contractors and hence, the allowance for preliminary and general (P&Gs) in the closure costs;
- Costing spreadsheets were compiled to adequately cover the aspects that have cost implications arising from the Final Rehabilitation, Decommissioning and Mine Closure Plan. Accordingly, the spreadsheets were structured in terms of the categories listed below:
  - Infrastructural areas;
  - Mining areas;
  - General surface rehabilitation;
  - Surface water reinstatement;
  - Post-closure (residual) aspects; and
  - Additional allowances.
- An additional summary sheet is included in the closure costs, indicating the items that most notably contribute to the changes between the 2017 and 2018 closure costs, with a concise summary of the reasons for each;
- As a general principle, handover of any infrastructure to third parties at closure was only considered in the closure costing if an agreement is in place with the relevant third party; should no such agreement be in place, it will be assumed that the infrastructure will be demolished at closure. However, potential

exceptions to this standard will be evaluated on a case-by-case basis, where such infrastructure is deemed highly likely be sold before or at closure or has been earmarked for transfer as part of any formalised commercial redevelopment scheme. Costs have also been allowed under Ezulwini to conduct a feasibility assessment into the potential transfer of mining assets to third parties;

- The closure costs updates were conducted within the context of the envisaged next land use expected to be implemented after mine closure. However, the costs only address material requirements to enable the likely next land use to be feasibly implemented after closure and does not include the costs of establishing the next land use, other than where such is considered part-and-parcel of the closure process or required to mitigate a residual impact after closure;
- In accordance with international accounting practices, no cost off-sets due to possible salvage of dismantled infrastructure will be considered;
- It was assumed that most infrastructure in the underground workings will remain underground at closure and will not be brought to surface for salvaging. Alternatively, where feasible it was assumed that any underground infrastructure will be removed immediately prior to commencement of the site closure contemplated in these costs, and will therefore be financially accounted for elsewhere, hence no costs have been allowed for the removal of underground infrastructure;
- Where required, cost allowances/adjustments were made based on specific closure-related obligations and commitments contained within Sibanye's existing approved EMP and other environmental related authorisations and permits;
- The unscheduled closure costs were only determined for infrastructure/activities/projects already in place, and not on planned infrastructure/activities/projects, even if such infrastructure/activities/projects are included in approved EMPr's or covered by existing guarantees;
- The unscheduled closure scenario will be contemplated as the immediate and unplanned closure of an individual mining operation and as per the issued mining might, i.e. Ezulwini (GP 38 MR), and not the potential cessation of all mining operations in the country by Sibanye as a whole; and
- The closure costs as reflected in this report and the appended spreadsheets are at present day values, and no escalation or discounting has been applied, as it was assumed that this would be conducted by Sibanye using preferred in-house adjustment values.

5.2 Infrastructural aspects

- The demolition cost quantifications for surface infrastructure components were revised and updated based on the quantification and measurement (floor areas, heights and specific descriptions) as per the recent infrastructure inventory work undertaken by Umhlaba Consulting and crossed checked against the Google Earth .kmz location files provided. Additional costs for the demolition and removal of concrete bases/floors and other allowances as required were also made based on this information. It was assumed that the measurements and quantities contained in the information provided is correct, and Golder did not verify any measurements or quantities as received, although where minor discrepancies/omissions were identified, re-measured by Golder and accordingly indicated in the line item narratives of the closure costs spreadsheets;
- Concrete and uncontaminated demolition waste will in principle be used for backfilling or earthworks-related rehabilitation where feasible or will otherwise be disposed on the regional Sibanye waste disposal facilities as costed for in the respective Kloof and Driefontein closure costs. Load and haul allowances were applied to allow for transport of the demolition waste for these purposes as required;

- Recoverable steel and other salvageable items will be sent to the salvage yard for sorting and screening and costed for, however no cost offsets in this regard will be applied;
- Nominal allowances for the transport and disposal of an amount of hazardous material/waste at Holfontein were made, and informed by specific observations made during the site visit and/or relevant background information provided;
- Infrastructure not to be demolished at closure includes tarred public roads and publicly used gravel roads, which provides access to the surrounding farm owners and to Eskom's infrastructure, surrounding properties and also for post-closure monitoring and maintenance purposes; and
- It is intended that crushed tar and contaminated surfacing material will at scheduled closure be used by a third party, and that an agreement would be in place prior to handover of the material. In the event that such an agreement cannot be reached prior to closure, the material will be disposed of at Holfontein or other appropriately licensed disposal facility. For unscheduled closure the assumption will be that this material will be disposed of at Holfontein.

5.3 Mining aspects

- The TSF at Ezulwini will be rehabilitated in situ for both unscheduled and scheduled closure, as per previously adopted approach, as well as any further measures as deemed necessary. It is noted that there are currently no TSFs at Cooke, RUSO and Ezulwini earmarked for transfer to third parties for reprocessing; and
- For unscheduled closure, existing WRDs will be rehabilitated in-situ as per the individual approaches established during the 2017 closure costs. Fugitive waste rock will be consolidated with larger waste rock dumps and rehabilitated in situ by profiling the dump and allowing the dump to naturally re-vegetate over time, due to the lack of available growth medium.

5.4 General surface rehabilitation

- Cost allowances for the rehabilitation of specific areas such as watercourses, wetlands and the like that were historically impacted by Sibanye's mining operations were made based on the information available. Where costs have already been determined by Sibanye as part of a specific project work scope, the costs to physically implement this work provided by Sibanye was included in the costs. At present, this includes costs for the rehabilitation of the Leeuspruit and KleinWes Rietspruit; and
- In instances where the required work scope has been defined but not costed, Golder costed the work based on the information as provided. In instances where a work scope has yet to be defined, an allowance to conduct the relevant specialist studies in order to define the work was made.

5.5 Post-closure aspects

- The closure costs for Ezulwini were benchmarked against the costs included in the Final Basic Assessment for the cessation of pumping and partial closure and related requirements (Jones and Wagener, 2017b) as well as the Dolomite Management Strategy (Jones and Wagener, 2017c), to understand the implications of the re-watering on the closure of Ezulwini, and to ensure that these aspects are adequately provided for in the closure costs;
- For the 2017 closure costs, it had been assumed that the quality of the shallow groundwater seepage water originating from the TSF is of an acceptable quality to not warrant interception and pumping after closure, specifically if it is left to re-water to above oxidation levels. Allowance was therefore made in 2018 to monitor surface- and groundwater qualities after initial implementation of the closure plan, to verify this assumption;

- Current indications are also that the decant water that will daylight at the Gemsbokfontein Eye will also be of sufficient quality for release into the environment. Allowance was therefore made in the 2018 costs to monitor the surface- and groundwater quality after closure, to verify that the expected decant water quality is achieved as well as for potential mobilisation of radioactivity in selected downstream watercourses, and to implement any additional mitigation of required;
- Work is currently being conducted as part of Project Rescue to develop a comprehensive and integrated mine water strategy for al lth Westrand gold mines, the outcomes of which will be addressed in a future closure costs update, once the required supporting information to do so is available;
- The closure costs also make provision for a number of additional studies that will likely be required in the event of unscheduled closure, including:
  - Radiation assessments for all infrastructure complexes to be demolished or potentially transferred to third parties;
  - Consolidation of the available groundwater specialist studies in order to formulate an appropriate post-closure mine water management approach;
  - Compiling a social impact mitigation plan (SIMP) for Ezulwini, to inform social-closure related matters that need to be addressed in future closure planning for the mine;
  - Conducting engineering designs, environmental authorisations and permitting requirements to support closure;
  - Performing a photographic assessment of the level of cracking of existing structures to establish monitoring baseline prior to re-watering; and
  - Conducting annual sinkhole and subsidence LIDAR monitoring - 10 cm LIDAR subsidence monitoring of Ezulwini underground workings area for 10 years, i.e. a period of seven years after re-watering commences, as well as three years after decanting commences.
- Regarding the above, costs for monitoring during the period prior to cessation of pumping and mine re-watering, i.e. surface and groundwater, wetlands, aquatics and biomonitoring, are not included in the closure costs, as it was assumed these costs are budgeted for elsewhere. Similarly, Costs for LIDAR monitoring during the period prior to cessation of pumping and mine re-watering are not included, as it was assumed this cost is budgeted for elsewhere;
- Allowances for preliminaries and general matters as well as contingencies will be revised based on the recommendations received from Jet Demolition, as guided by industry norms and requirements;
- It is furthermore noted that only costs for residual impacts expected after closure will be included, and that latent risks are not costed for, other than for conducting studies to quantify risks that are expected to remain after closure; and
- the likelihood of a number of potential post-closure impacts occurring is at present unknown and will only become known once during re-watering of the underground workings, or even after this has completed and decant occurs. These include the following:
  - The potential occurrence and extent of on-surface subsidence related to re-watering, and associated impacts to infrastructure such as houses, roads and railway lines located within the affected areas;
  - The potential requirement to treat decant water daylighting at the Gemsbokfontein Eye, due to this water being of a poorer quality than is currently being predicted; and

  - The potential requirement to halt the re-watering of the underground mine workings, and consequently to resume with pumping at short notice.

- The interventions that would be required to deal with these aspects should they occur are therefore included in the closure costs as post-closure contingencies and must be reviewed and updated as more information becomes available.

6.0 SITE-SPECIFIC CLOSURE MEASURES

The site-specific closure measures applied during the 2018 closure costs review and update are reflected in Table 2 to Table 6 below. The sub-sections are aligned to the costs for each operational area of the respective mines, as contained in the closure costs workbook, and should be read in conjunction with the narrative notes in the spreadsheets.

6.1 Infrastructure areas

Table 2: Site-specific closure measures for infrastructural aspects

Closure cost component	Closure cost allowances	
	Unscheduled (2018)	**Scheduled (as per respective LOM)**
Steel structures, reinforced concrete structures, offices, workshops, pump stations, buildings and related structures and infrastructure	■ Dismantle and remove off-site the heavy equipment, for disposal or reuse at other mining operations if feasible ■ Demolish and remove steel structures as well as steel tanks, clarifiers, thickeners, silos, crushers and other related steel structures to dedicated decontamination bay to be established at the mines. Subsequently sort at salvage yard for recycling ■ Dismantle and remove the vertical shaft headgear steel components, including overland and elevated conveyors ■ Demolish concrete structures, plinths and bases to a depth of 1 m below ground level. This includes concrete paved areas/walkways, bunded areas, and also the salvage and storage yards at the end of closure ■ Demolish brick buildings/structures, offices and related buildings ■ Rehabilitate resultant footprint as part of general surface rehabilitation	■ As for unscheduled closure
Services and other linear infrastructure	■ Fences: ▪ Remove all fencing, including gates, not required to support the next land use ▪ Demolish all concrete foundations/supports to 1 m below ground level ▪ Rip tracks along the fence and allow for natural re-vegetation ■ Power lines and pipelines:	■ As for unscheduled closure

Closure cost component	Closure cost allowances	
	Unscheduled (2018)	**Scheduled (as per respective LOM)**
	▪ Remove all on site power lines, except the main feed lines leading to Eskom's substation ▪ Remove all operational pipelines on surface. Underground pipelines will be left as is with exposed open ends closed-off and covered ■ Railway lines: ▪ Remove remaining railway tracks infrastructure and dispose as demolition waste. Recover ballast material for re-use ▪ Remove any railway embankments constructed of waste rock for disposal in the nearest open pit, and conduct routine surface profiling and rehabilitation as required	
Roads	■ Rehabilitate access and gravel roads including all roads inside mine complexes and roads between shafts and mines' infrastructure, unless where such roads are indicated to support existing/intended future land uses	■ As for unscheduled closure
Waste handling and disposal	■ Recycle waste that can be recycled/salvaged (e.g. steel) after decontamination ■ Decontaminate all process-related concrete demolition waste at dedicated demolition bay, and crush on site ■ Remove inert demolition waste and utilise for local backfilling where feasible, as well as disposal at a centralised waste disposal site to be constructed for this purpose ■ Transport remaining hazardous and contaminating materials and wastes to a suitably licenced facility for disposal	■ As for unscheduled closure

6.2 Mining areas

Table 3: Site-specific closure measures for mining aspects

Closure cost component	Closure cost allowances	
	Unscheduled (2018)	**Scheduled (as per respective LOM)**
Shafts, adits and inclines	■ Plug vertical and inclined service and ventilation shafts according to DMR standards. In principle the cap consists of a reinforced concrete plug, rock anchors, suspended shuttering and steel beams covering the shaft opening with final infilling to ground level ■ Conduct profiling of area to be free-draining ■ Rehabilitate resultant footprint as part of general surface rehabilitation	■ As for unscheduled closure
Waste rock dumps	■ Remove and transport a number of the smaller excess overburden and other rock dumps fugitive piles: ▪ Excavate and load and haul available rock, including over-excavation of footprint areas as indicated, based on site observations ▪ Dispose of remnant rock material in closest open pit ▪ Clean-up of remnant rock veneer, shape, level and rehabilitate footprint area as part of routine surface rehabilitation ▪ A percentage of the overburden and other rock material will also be utilised for creating enviro-bunds around the open pits for unscheduled closure ■ Rehabilitate overburden and other waste rock material piles that will not be backfilled into RUSO pits in such a manner that they can still be crushed as aggregate or used as backfill in future, by consolidating the material	■ Assume that the majority of the rock dumps will have been largely crushed or backfilled into the pits at scheduled closure. Remove any remaining waste rock veneer, apply lime to neutralise potential soil acidity and rehabilitate as part of routine site-wide rehabilitation

Closure cost component	Closure cost allowances	
	Unscheduled (2018)	**Scheduled (as per respective LOM)**
	and shaping to achieve stable side slopes. Conduct minimal profiling of dump and surroundings to achieve suitable drainage conditions and re-vegetate	
Historic slimes and other sludge deposition areas, historically impacted water features	■ Clean-up of contaminated sludge or soils to depths indicated for the respective areas ■ Load and haul contaminated sludge / soils to the nearest TSF ■ Apply lime to neutralise potential soil acidity, where indicated ■ Shape, level and rehabilitate footprint area as part of routine surface rehabilitation	■ Assume contaminated sludges/soils would be excavated and reprocessed/disposed during operations and disturbed footprint rehabilitated during operations
Tailings storage facility to be rehabilitated in situ	■ Rehabilitate existing TSF as follows: ▪ Plug outlet and seal penstock of tailings dam ▪ Rehabilitate those aspects/faces of the TSF that are typically expected to experience the most hostile rehabilitation conditions, namely the top/beach, and northern and westerly side slopes, as follows: – Shaping of embankment/outer slopes to an angle of 1:4 to 1:5, as surrounding site conditions and other technical considerations will dictate – Minor shaping on upper surface to accentuate beach and facilitate appropriate runoff – Apply lime breaker layer to prevent upwards migration of salts into soil growth medium cover	■ Same as for unscheduled closure, as determined by the degree of operational rehabilitation and status of the TSF at the time of closure ■ If TSF is already reprocessed at scheduled closure, rehabilitate footprints as follows: ▪ Making good of TSF footprint after re-processing and prior to final shaping and rehabilitation ▪ Excavate 250 mm material on footprint to remove the possibility of radioactive material ▪ Apply lime to neutralise potential soil acidity, where indicated ▪ Shape resultant footprint areas to facilitate surface runoff and positive drainage and to prevent soil

Closure cost component	Closure cost allowances	
	Unscheduled (2018)	**Scheduled (as per respective LOM)**
	– Place an evaporative soil cover (up to 400 mm, but a minimum of 300 mm depending on soil availability) on outer slopes and upper surface utilising any existing stockpiled soil and locally sourced material – Vegetate the shaped northern and western slopes and upper surface, with application of additional soil amelioration and fertiliser as required ■ Rehabilitate TSF side slopes that cannot be sloped out due to surrounding site/other technical constraints, or where demonstrated feasible to do so through geochemical analysis and appropriate trials (expected to be limited to the southern and eastern slopes), as follows: – Prepare side slopes as required, including existing rill erosion repair, slope stabilisation and localised profiling – Install leaching equipment and piping and leach side slopes for a period of approximately 18 months – Prepare side slopes to receive vegetation, including: • Application of agricultural grade dolomitic lime up to 120 t/ha (or as required) • Decomposed mushroom compost at 80 m^3/ha • 50 kg superphosphate bags at 12 bags/ha	erosion, and rehabilitate as part of routine surface rehabilitation

Closure cost component	Closure cost allowances	
	Unscheduled (2018)	**Scheduled (as per respective LOM)**
	• 50 kg agricultural fertilizer and additional ZN at 5 bags/ha – Application of an appropriate grass species mix ■ Implement general storm water routing along TSF upper surface and along toe throughout, to ensure overall integration of the rehabilitated landform into the surrounding landform	
Pollution control dams, bio-dams and all other settling systems for discharges	■ Rehabilitate pollution control and return water dams as follows: ▪ Remove and transport contaminated soil/sediment from within dams and dispose on an open portion of the nearest TSF before final rehabilitation ▪ Remove HDPE liners where these are present, shred and dispose on waste disposal site with other demolition wastes ▪ Excavate potentially contaminated in-situ soils from all dirty water dams (assumed 300 mm and 150 mm for unlined and lined dams respectively) and dispose on an open portion of the nearest TSF before final rehabilitation ▪ Breach dam walls and reshape to a minimum of 1:5 where these occur and/or doze in excavated material ▪ Shape and level the dam basins to be free draining ■ Rehabilitate resultant footprint areas as part of general surface rehabilitation	■ As for unscheduled closure

6.3 General surface rehabilitation

Table 4: Site-specific closure measures for general surface rehabilitation aspects

Closure cost component	Closure cost assessment	
	Unscheduled (2018)	**Scheduled (as per respective LOM)**
Plant, infrastructural and mining facility footprints and intermediate disturbed areas	■ Shape and profile the disturbed areas from which plant and related infrastructure have been removed to match surrounding topography and to ensure free drainage, thus limiting surface erosion ■ Rip with agricultural equipment the footprint areas from where infrastructure has been removed as well as general disturbed areas to a minimum depth of 300 mm to alleviate compaction ■ Rip the heavily compacted (hard stands, haul roads, overburden and other rock dump footprints) with construction equipment, and over-rip with agricultural equipment in order to create suitable conditions for vegetation establishment ■ Shape and profile disturbed surface areas to be free draining and emulating the natural surface topography as far as possible ■ Establish vegetation on prepared areas, including application of additional soil amelioration and fertiliser where indicated for hostile soil conditions such as TSFs and reprocessed footprints	■ As for unscheduled closure
Site-specific rehabilitation aspects	■ Implement site-specific closure measures for addressing sources of surface water contamination and rehabilitation of watercourses and wetlands historically impacted by Sibanye mining activities, as indicated in relevant Project Rescue or other rehabilitation plan specifications/inclusions. These include the Leeuwspruit and KleinWes Rietspruit	■ Assume that these projects and measures will have largely been implemented during operations

6.4 Preliminaries and general, contingencies and additional allowances

Table 5: Preliminaries and general, contingencies and additional allowances

Closure cost component	Closure cost assessment	
	Unscheduled (2018)	**Scheduled (as per respective LOM)**
Preliminaries and general	■ Allowance of 6 percent for Ps&Gs of the total for infrastructural and related aspects (sub-total 1 on summary costing table) has been made	■ As for unscheduled closure
Contingencies	■ Contingencies percentage allowances for the total costs for the following aspects has been made: ▪ 7.5% for infrastructural aspects; ▪ 7.5% for mining aspects; and ▪ 10% for general surface rehabilitation. ■ In this regard, it is noted that the level of accuracy of the infrastructural and mining aspects have been substantially improved over the course of the last two years' updates, for which reason the associated contingency allowances have been adjusted	■ As for unscheduled closure
Additional allowances for specialist work and environmental authorisations	■ Allowance has been made to conduct the following in support of the closure process, for the respective operational areas as indicated: ▪ EIA, IWWMP and IWULA for the closure of respective operational complexes and facilities, as required ▪ Radioactivity decommissioning studies for the following: – All process related infrastructure areas to be demolished and rehabilitated or potentially transferred to third parties	■ Assumed that the required specialist studies and environmental authorisations would have been conducted during the remaining operational period, with the exception of the following: ▪ Annual sinkhole and subsidence LIDAR

Closure cost component	Closure cost assessment	
	Unscheduled (2018)	**Scheduled (as per respective LOM)**
	– All in-situ rehabilitated rock dumps and any associated footprints not yet completely rehabilitated – In-situ rehabilitated TSF and any associated footprints not yet completely rehabilitated ▪ Development of waste management plans for all operational complexes ▪ Contaminated land assessments of all plant and associated contaminated areas which is deemed to include shaft complexes ▪ TSF geochemical characterisation, which will incorporate available groundwater monitoring work to determine TSF capping and possible shallow seepage intervention and management requirements, as well as capping requirements ▪ Engineering cover designs and landform profiling designs for in-situ rehabilitated TSF ▪ Detailed capping/closing specifications, scheduling and associated cost assessment for holings associated with historical underground mining ▪ Stakeholder consultation and compiling of social impact mitigation plan (SIMP) for each mine ▪ Photographic assessment of existing cracking of structures to establish monitoring baseline prior to re-watering	monitoring - 10 cm LIDAR subsidence monitoring of Ezulwini underground workings area for 10 years, i.e. a period of seven years after re-watering commences, as well as three years after decanting commences

Closure cost component	Closure cost assessment	
	Unscheduled (2018)	Scheduled (as per respective LOM)
	▪ Annual sinkhole and subsidence LIDAR monitoring 10 cm LIDAR subsidence monitoring of Ezulwini underground workings area for 10 years, i.e. a period of seven years after re-watering commences, as well as three years after decanting commences	

6.5 Post-closure aspects

Table 6: Site-specific allowances for post-closure aspects

Closure cost component	Closure cost assessment	
	Unscheduled (2018)	Scheduled (as per respective LOM)
Initial surface- and groundwater monitoring	■ Conduct initial monthly surface water monitoring over a ten-year period at 15 monitoring points, by which time decant at Gemsbokfonten Eye will have started. Additional 3 years (re-watering is indicated to occur in 7 years) allowed for, in the event that re-watering takes longer than modelled ■ Conduct initial quarterly groundwater monitoring over a minimum ten-year period at 28 monitoring points, until decant occurs at the Gemsbokfontein Eye. 6 of these locations will be monitored for water quality, and all of the points for water levels. Additional 3 years (re-watering is indicated to occur in 7 years) allowed for, in the event that re-watering takes longer than modelled	■ As for unscheduled closure
Wetlands, biomonitoring and aquatics monitoring	■ Conduct wetlands, biomonitoring and aquatics monitoring, including biannual biomonitoring for 3 years and annual PES, EIS and Ecosystem Services for 3	■ As for unscheduled closure

Closure cost component	Closure cost assessment	
	Unscheduled (2018)	**Scheduled (as per respective LOM)**
	years on the Leeuspruit and KleinWes Rietspruit, and for 10 years on Wonderfonteinspruit	
Rehabilitation monitoring	■ Conduct monitoring of rehabilitated areas for a minimum five-year period	■ As for unscheduled closure
Care and maintenance of rehabilitated areas	■ Conduct care and maintenance of the rehabilitated areas over a five-year period, with high intensity care and maintenance being conducted for the rehabilitated main plant and shaft areas, overburden and other rock dumps and TSFs as indicated	■ As for unscheduled closure
Post-closure surface, sediment radioactivity monitoring and groundwater quality monitoring	■ Conduct surface- and groundwater quality monitoring once decant has started for a further period of ten years (upstream, at and downstream of the Gemsbokfontein Eye decant point), to verify that the expected decant water quality is achieved, and to implement any additional mitigation of required. Additional 2 years (EMPr recommends 3 years) allowed for, in the event that insufficient decant volumes available for monitoring due to drought or other causes ■ Sampling of and NECSA laboratory analysis of Leeuspruit and KleinWes Rietspruit sediment, for potential mobilisation of radioactivity in sediments, for period of 5 years post-decant. Additional 2 years (EMPr recommends 3 years) allowed for, in the event that insufficient decant volumes available for monitoring due to drought or other causes	■ As for unscheduled closure

Closure cost component	Closure cost assessment	
	Unscheduled (2018)	**Scheduled (as per respective LOM)**
Contingency allowances for dealing with potential post-closure aspects	Contingency allowances for dealing with potential post-closure aspects was made as follows: ■ Potential emergency halting of re-watering - allows for installation of 2 x ANDRITZ dewatering pumps, pipelines, associated equipment and ancillary support work ■ Possible re-watering sinkhole rehabilitation costs - allowance to repair potential post-re-watering damage to open land, highways, railway lines and residences ■ Possible relocation of existing 5ML Ezulwini WTP - estimated costs to relocate the existing Ezulwini 5ML water treatment plant to the Gemsbokfontein Eye decant point, should poor quality water decant	■ As for unscheduled closure

7.0 CLOSURE COSTS, AS AT DECEMBER 2018

The closure costs are structured according to the format routinely used for the presentation of closure costs for mine sites as per the following categories:

- Infrastructural areas;
- Mining areas;
- General surface rehabilitation;
- Water management;
- Post-closure aspects; and
- Additional allowances.

The December 2018 closure costs for Ezulwini for routine unscheduled and scheduled closure (exclusive of VAT) are summarised below and presented in Table 7.

Table 7: Sibanye Gold Ezulwini Mine Closure Costs, as at December 2018

Closure components		Unscheduled Closure (2018)	Scheduled Closure (2027)
1	Infrastructural aspects	R 43,969,408.46	R 26,389,624.74
2	Mining aspects	R 47,124,867.81	R 20,447,807.71
3	General surface rehabilitation	R 39,140,183.23	R 24,993,994.71
	Sub-Total 1	**R130,234,459.49**	**R71,831,427.15**
5	**P&Gs, Contingencies and Additional Allowances**		
5.1	Preliminary and general	R 15,628,135.14	R 8,619,771.26
5.2	Contingencies	R 10,746,089.04	R 6,012,206.90
5.3	Additional studies	R 4,756,306.00	R 2,750,000.00
	Sub-Total 2	**R31,130,530.18**	**R17,381,978.16**
6	**Post Closure Aspects**		
6.1	Initial surface water monitoring	R 3,420,780.00	R 3,420,780.00
6.2	Wetlands, biomonitoring and aquatics monitoring	R 1,260,000.00	R 1,260,000.00
6.3	Initial groundwater monitoring	R 1,659,944.00	R 1,659,944.00
6.4	Post-decant surface water monitoring	R 165,994.40	R 165,994.40
6.5	Post-decant groundwater monitoring	R 855,195.00	R 855,195.00
6.6	Rehabilitation monitoring	R 469,379.37	R 844,043.74
6.7	Care and maintenance	R 11,956,249.93	R 12,371,953.00
6.8	Contingencies for post-closure aspects	R 76,010,000.00	R 76,010,000.00
	Sub-Total 3	**R95,797,542.70**	**R96,587,910.14**
	Grand Total Excl. VAT.	**R257,162,532.37**	**R185,801,315.46**

7.1 Material variances between 2017 and 2018 closure costs

Table 8 below summarises the main factors that have resulted in a notable change when comparing the 2017 and 2018 closure costs, noting that smaller or specific contributing factors have been excluded.

Table 8: Material variances between 2017 and 2018 unscheduled closure costs

Previous (2017) closure costs	2018 closure costs
■ Demolition quantities for process infrastructure and buildings had been based on measurements and calculations conducted approximately five years ago, and that were based on aerial imagery and limited site observations. Layout plans were not available. The information (battery limits) was incrementally updated thereafter as new information became available	■ Demolition quantities for infrastructure and buildings were updated based on infrastructure inventories recently conducted by Umhlaba Consulting, which has resulted in an overall increase in the costs for this aspect. It is noted that these inventories did not include most process-related plant, the closure costs for which were reviewed and adjusted where deemed required ■ Certain homogenous infrastructural areas such as hostels were previously measured as compound areas and an aggregated rate assigned (due to time constraints and lack of information at the time). These costs items have now been replaced by individual line items; ■ Various assumptions previously made regarding the building types costed which were now refined with the availability of the Umhlaba Consulting inventories. For example, a number of brick buildings / building complexes were previously assumed as being single story, but were confirmed as being double story during the 2018 verification, and total surface areas of a number of hostels were previously significantly under-quantified; ■ Very large combined expanse of paved surfaces was previously not included in the costs
■ Costs for crushing of concrete had historically not been included, which had been indicated as a matter requiring attention in previous closure costs	■ Costs for crushing of concrete demolition waste were included, based on the volume estimated to result from demolition
■ The application of a lime breaker layer as part of the TSF cover had not previously been costed	■ For the TSF to be rehabilitated in situ, costs were included to apply a lime breaker layer prior to placing the TSF soil cover, to prevent salinization of the growth medium. This resulted in a modest increase in the closure costs for the TSF ■ A more pragmatic approach was also adopted in terms of the side slope rehabilitation, as in practice it is highly unlikely that all TSF side slopes could be

Previous (2017) closure costs	2018 closure costs
	sloped out, due to surrounding landscape restrictions and the resultant loss of productive/ecologically sensitive land. In these instances, vegetation establishment directly onto the tailings without notable slope modification, facilitated by extensive leaching and comprehensive soil amelioration, was adopted. In the majority of instances, these measures resulted in a slight decrease of the associated closure costs for the TSF
■ Costs for site-specific watercourse rehabilitation costs had not been allowed, as this was generally deemed to be included in the site-wide rehabilitation	■ Costs were allowed for rehabilitation of mainly the Leeuspruit and KleinWes Rietspruit, as well as other watercourses areas that require remediation
■ Costs for preliminaries and general matters, and contingencies were determined at 6%, and 10%, respectively	■ Ps&Gs for 2018 remain unchanged at 6% ■ Contingencies for 2018 have been reduced from 10% to 7.5% for infrastructural and mining aspects respectively, but have remained at 10% for general surface rehabilitation
■ Unit rates for surface and groundwater as well as rehabilitation monitoring were largely derived from the 2016 unit rates	■ New unit rates for surface and groundwater as well as rehabilitation monitoring were developed, based on quotations and other inputs received from relevant laboratories and contractors, which has resulted in a decrease of these unit rates
■ Costed specialist studies required to support closure included more specialist studies than some of the other Sibanye Gold operations' costs	■ Costs for some additional specialist studies were included in consultation with Sibanye, based on the outcomes of the initial risk identification and project workshops, as well as information provided by Sibanye: ▪ Infrastructure third-party transfer feasibility pilot study based on Ezulwini housing units and associated infrastructure ▪ TSF geochemical characterization ▪ Engineering cover designs and landform profiling designs for in-situ rehabilitated TSF ▪ Integrated specialist study to identify and scope surface contamination, surface and groundwater remediation and management requirements

Previous (2017) closure costs	2018 closure costs
	▪ Photographic assessment of cracking of existing structures to establish monitoring baseline prior to re-watering ▪ Annual sinkhole and subsidence LIDAR monitoring 10 cm LIDAR subsidence monitoring of Ezulwini underground workings area for 10 years
■ Allowance for surface and groundwater quality monitoring was made for a period of five years at 15 locations, after implementation of the closure plan	■ Surface and groundwater quality monitoring was increased to a period of 10 years after implementation of the closure plan (including wetlands, biomonitoring and aquatics monitoring), ■ Costs for a further 5 years of decant and groundwater monitoring at three locations ■ Sampling of and NECSA laboratory analysis of Leeuwspruit and Kleinwes Rietspruit sediment, for potential mobilisation of radioactivity in sediments, for period of 5 years post-decant
■ No contingency allowance for dealing with potential post-closure aspects was made	■ Contingency allowances for dealing with potential post-closure aspects was made as follows: ▪ Potential emergency halting of re-watering ▪ Possible re-watering related sinkhole rehabilitation costs ▪ Possible relocation of existing 5ML Ezulwini water treatment plant to treat poor quality decant water

8.0 FURTHER WORK REQUIRED

The following recommended actions and further work were identified to inform on-going operational rehabilitation management and eventual closure of Ezulwini:

- Evaluation of the likely requirement to revise the current allowances for preliminaries and general aspects (Ps&Gs), which at present has been calculated on 6% of the routine closure plan implementation costs (total 1 in the closure costing spreadsheets). Current market indications are that the costs for this aspect has generally increased in recent years due to more stringent health and safety requirements and BEE-related labour and supplier sourcing specifications, amongst others;
- Developing an operational waste management plan for each complex, to address the matter of waste that accumulates in various areas of the mines over time, and posing the risk of becoming a liability resulting in additional costs at the time of mine closure;
- Investigation of the feasibility of alternative waste disposal options for the various demolition waste disposal streams, to:
  - Use of decontaminated material for backfilling and other earthworks related purposes;

  - Crushing and recycling of demolition waste by third party specialist contractors, specifically in the case of tar and asphalt material; and
  - Entering into service agreements with suitable contractors for work of this nature executed as part of operational rehabilitation.
- Identifying which of the remotely located buildings and structures can be demolished during operations to reduce the mining footprint and rehabilitation requirements at closure;
- Investigation into third party post closure infrastructure uses (including Eskom substations);
- Development of an inventory and demolition/removal schedule for underground infrastructure to ensure that no potential liabilities remain after closure;
- Performing initial contaminated land assessments of all the plant and associated supporting work areas, to inform potential operational remediation efforts as well as provide greater resolution on eventual closure requirements in terms of soil contamination;
- Development of detailed, site-wide materials balance and sourcing investigation for the areas where this does not exist, to inform future operational and closure-related rehabilitation;
- Refining the specific requirements for TSF rehabilitation on an individual basis, taking into consideration surrounding site and technical considerations/limitations, availability of soil or application of ameliorated subsoil as growth medium, specific tailings geochemical composition, side slope hardness and stability, extent to which the tailings phreatic water level has decoupled from surface recharge, and other relevant factors;
- Conducting updated alien invasive plant control studies over areas where soil is required during and after closure;
- Establishing the potential requirement for soil amelioration of the stored topsoil for growth medium purposes;
- Conducting closure-focussed consultation with key stakeholders from time to time, to ensure that closure planning conducted and implemented by the mine remains aligned with governmental requirements, and community expectations, as appropriate;
- Whether or not any of the potential post-closure contingency interventions as indicated in the closure costs may be required is at present unknown and will only become known once re-watering of the underground workings is complete and decant occurs. Hence, these costs must be reviewed and updated as more information becomes available; and
- A number of the proposed TSF rehabilitation measures will be reliant on appropriately managing shallow contaminated seepage where this occurs or can in future be expected to occur.

A more comprehensive, integrated post-closure water management strategy for the Sibanye Gauteng gold mining complex is currently in the process of being developed. The above aspects should therefore also be incorporated in the regional mine water management strategy. The outcomes of work should also be incorporated as far as possible and costed for in the respective 2019 mine closure plans and costs where relevant, towards compliance with the Financial Provisioning Regulations by February 2020.

9.0 CONCLUSION

This report reflects the updated 2018 planning and associated costs for the rehabilitation and closure of Ezulwini.

The costs were based on the previous closure costs developed by Golder, the observations made during the dedicated site visit conducted on 12 July 2018, and information provided by Sibanye. Notably, this included an extensive inventory of mainly non-process related infrastructure and buildings. The Golder unit rates database was updated using data obtained from specialist third-party demolition and rehabilitation contractors, and where required adapted to reflect site-specific conditions. Further work required to inform and refine future closure costs updates was also identified and cost allowances made where appropriate.

Mine closure planning is an iterative process and must therefore constantly be refined as new information becomes available, legislation changes, and industry standards and practices evolve.

Notwithstanding the above, the closure costs review and update process is deemed to have identified all pertinent considerations that may have a notable impact on the closure costs, for the unscheduled and scheduled situations, as at December 2018. These aspects have been costed to the extent possible based on the level of completeness of the available information, and further work/actions required to refine future revisions of these closure costs have been identified and included in the closure costs, where relevant.

10.0 STATEMENT OF INDEPENDENCE AND COMPETENCE

10.1 Statement of independence

Golder is an independent international environmental consultancy. Neither Golder nor its staff, have or have had, any interest in this project capable of affecting their ability to give an objective and unbiased opinion, and have and/or will not receive any pecuniary or other benefits in connection with the project, other than normal consulting fees.

10.2 Statement of competence

Golder prides itself as being at the forefront of mine closure and rehabilitation not only within Africa, but the world. Golder in Africa is currently taking the lead with respect to the technical innovation in this field, being the first with a numerical closure costing model, landform modelling as well as unsaturated flow through soil covers.

We are actively engaged in the evolution of international best practice, as represented by the standards of the World Bank and the IFC, as well as in the application of that best practice in our environmental and social consulting. We are also experienced in ensuring that our products, while meeting World Bank and IFC standards, are compliant with pertinent national legislation and clients' corporate standards.

Golder has in-depth experience in environmental and mining-related civil engineering, closure planning and cost determination. All closure-related work is guided and reviewed by Francois Marais, Brent Baxter, Brent Johnson or Mark Aken, in their respective capacities as senior strategic advisors in terms of rehabilitation and closure related projects.

The Golder Land use and Closure team has conducted closure planning, including facilitation/consultation with the respective regulatory authorities/agencies, throughout Africa. The team specializes in the closure of mining and industrial complexes, addressing the matter from both a strategic and detailed closure/costing perspective.

The South African closure cost and liability effort is strongly connected to the global Golder family and knowledge sharing, and advancement within the discipline is facilitated in this way. In addition, Golder is

known throughout the mining industry for its extensive experience in mining-related environmental assessment and permitting and has over the years conducted a broad range of services for all major mining houses and commodities throughout South Africa and the rest of the continent, as well as abroad.

11.0 REFERENCES

A vast body of background information was considered during the 2018 closure costs and broader closure planning process conducted for Cooke, Ezulwini and RUSO. However, the following information sources primarily informed the update of the closure costs itself:

- Department of Minerals and Energy, Converted Mining Right. 2007
- Golder, 2017. Sibanye-Stillwater - Review and Update of the Unscheduled and Scheduled Closure Costs for the Sibanye Cooke, Ezulwini and RUSO Operations (Revision 1) - Report number: 1775500-317222-3
- Google Earth aerial images
- Jones & Wagener, 2017a. Ezulwini Partial Closure Geohydrological and Geotechnical Assessment Final Report (Report No.: JW243/16/F925)
- Jones & Wagener, 2017b. Cessation of Pumping Operations at Ezulwini and Closure of Underground Mine Workings – Final Basic Assessment Report and Environmental Management Programme Report Addendum (Report No.: JW042/17/F925 – Rev 3)
- Jones & Wagener, 2017c. Ezulwini Partial Closure Geohydrological and Geotechnical Assessment Final Report - Appendix C - Dolomite Risk Management Strategy
- Photographs taken during the site visit undertaken on 12 July 2018
- Sibanye Surface TSF 2018.xlsx
- Umhlaba Consulting, 2016. Cooke, Ezulwini RUSO - Properties Assessment 2016, including accompanying Excel spreadsheets, Google Earth .kmz files and infrastructure photographic inventory
- Werksmans Attorneys, 19 July 2018. Closing and Amending Agreement between Sibanye Gold Limited and WRTRP Proprietary Limited and DRD Gold Limited
- WRD Recon FY2016 and FY2017.xlsx

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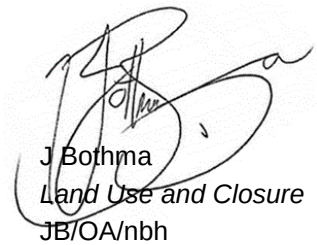

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APPENDIX A

Environmental legal obligations: (1896352_Mem013_SibanyeGold _Legal_Obligations_Ezulwini)

APPENDIX B

Closure costs spreadsheets

APPENDIX C

Document limitations

DOCUMENT LIMITATIONS

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