REPORT

SIBANYE-STILLWATER

Determination of the 2018 Closure Costs for Ezulwini Mine

Submitted to:

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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

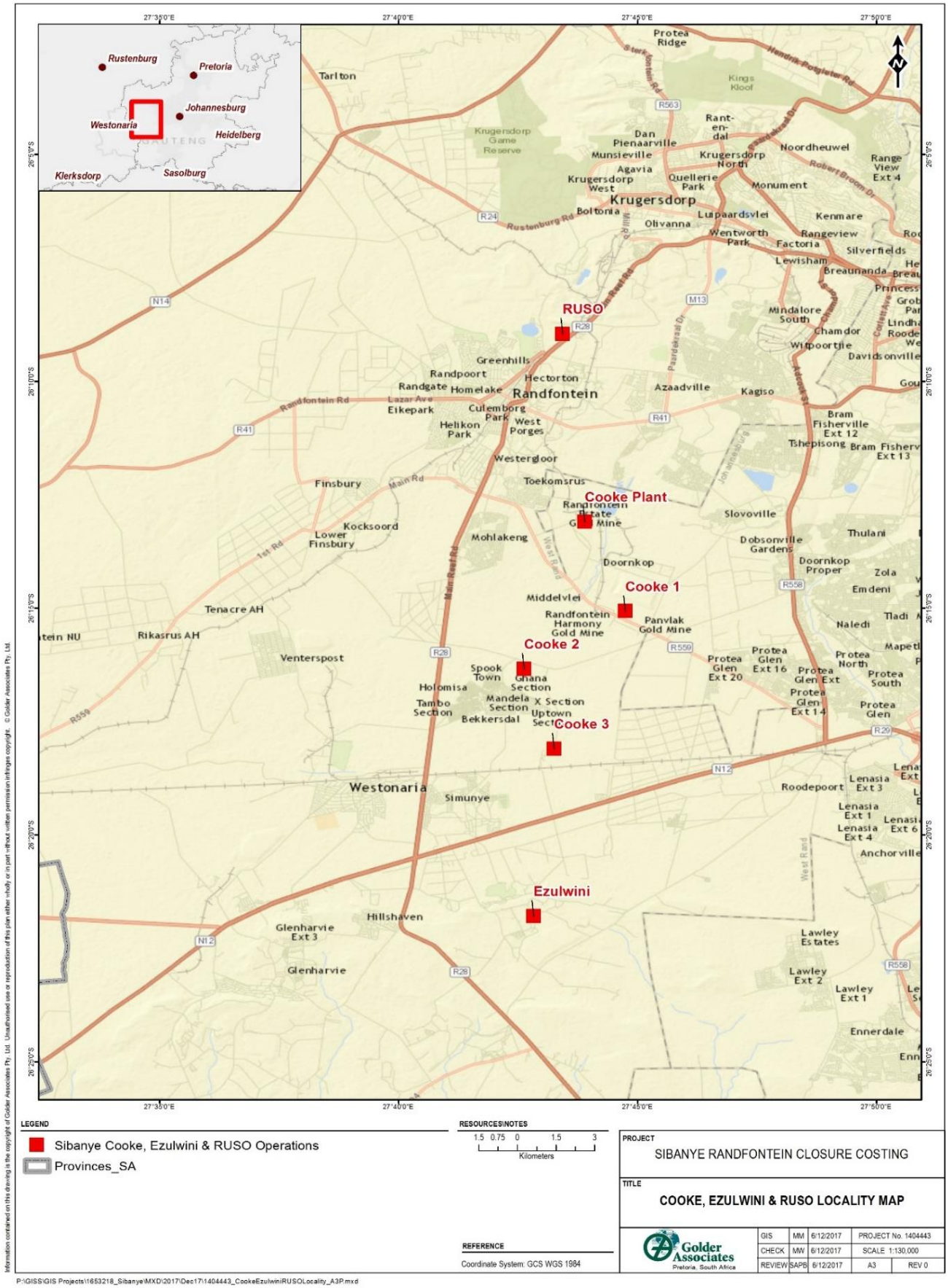

Figure 1: Location of the Ezulwini operations

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.

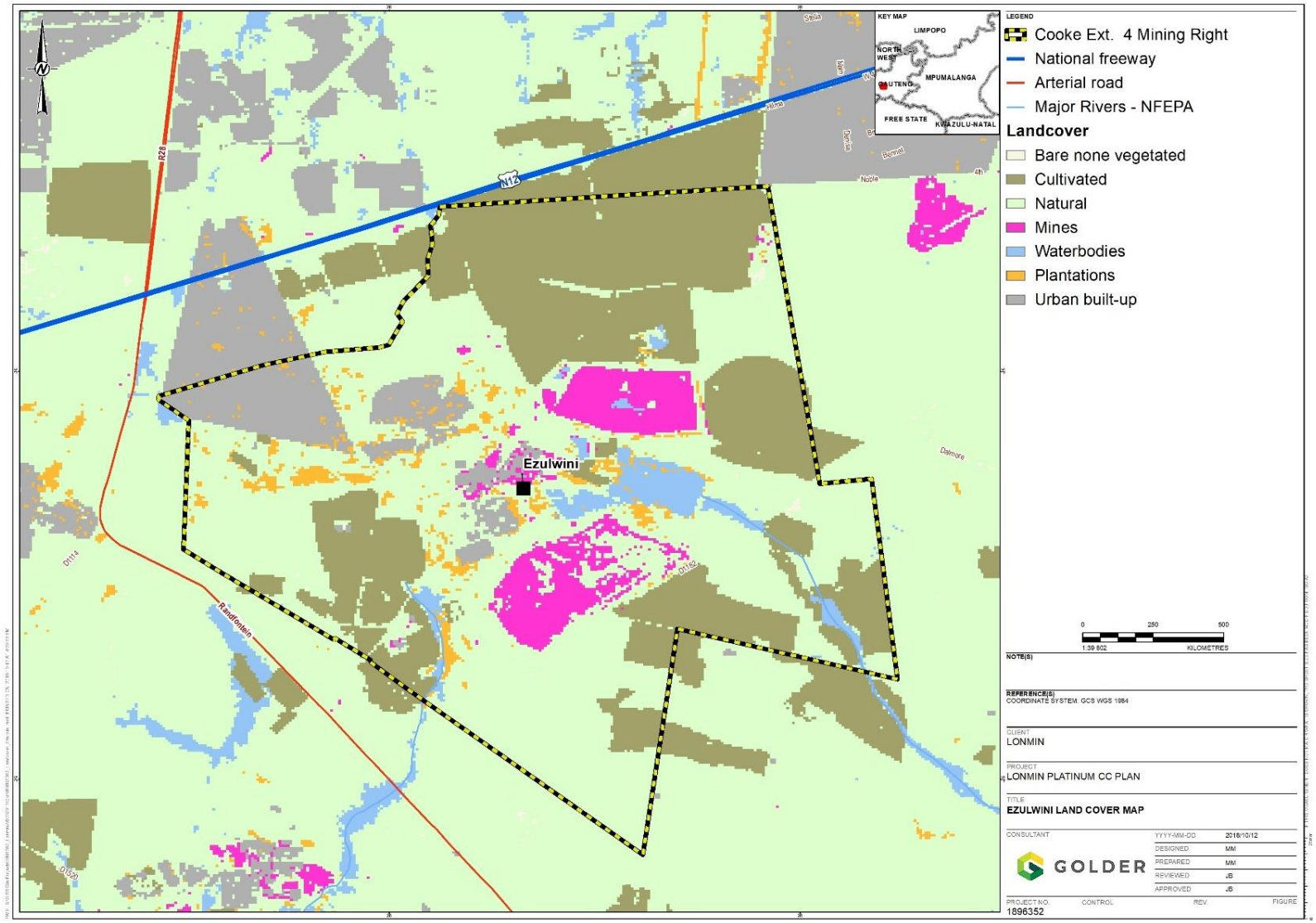

Figure 2: Ezulwini mining right and existing land cover and uses surrounding the mining area

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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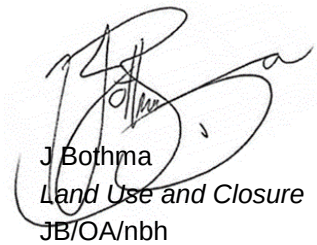

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APPENDIX A

Environmental legal obligations: (1896352_Mem013_SibanyeGold _Legal_Obligations_Ezulwini)

MEMORANDUM

DATE 12 April 2019 **Project No.** 1896352_Memo 013 Revision 1

TO Johan Bothma, Golder Associates

CC Rochelle Bloemhof

FROM Olivia Allen **EMAIL** oallen@golder.co.za

CLOSURE COST UPDATE FOR SIBANYE GOLD LIMITED – EZULWINI: CLOSURE RELATED LEGAL OBLIGATIONS

Introduction

This Memorandum summarises the initial assessment of the closure commitments/legal obligations in the existing environmental related authorisations and supporting documentation in place for Sibanye Gold Ltd.'s (trading as Sibanye-Stillwater) Ezulwini Mining Company (EMC), as well as other relevant contractual agreements/documentation provided by Sibanye to date, in support of the 2018 closure costing update and closure planning project being conducted by Golder.

Key assumptions and limitations

Key assumptions at the time the assessment was undertaken include the following:

- It has been assumed that Sibanye is not legally obligated to adhere to audit recommendations and the recommendations outlined in any reports that were compiled and submitted to regulatory authorities as a result of conditions associated with the various authorisations, e.g. recommendations from EMP audits, Klein Wes Rietspruit Wetland Delineation and Interim Rehabilitation Plan, etc. However, for completeness sake, the commitments contained in such documents have been summarised herein, to be taken into consideration during the development of the closure plan and operational rehabilitation plan.

The following documentation was outstanding at the time of conducting the assessment:

- Rehabilitation strategy and implementation plan (RSIP);
- NNR Certificates(s) of Registration; and
- Dolomite Risk Management Strategy compiled in support of the partial closure plan (Jones and Wagener, 2017).

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Table 1: Ezulwini closure related legal obligations

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
Department of Minerals and Energy. 2006. Mining Right. (38) MR	Battery limits	■ The mining right area (GP 30/5/1/2/2/3 (38) MR) is 3 718 ha in extent, covering various portions of the farm Jachtfontein 344 IQ, Modderfontein 345 IQ and Waterpan 292 IQ ■ The MR expires in 2036.	■ The battery limits for the closure costing and planning must be aligned with the MR area
Shangoni. 2015. Ezulwini Mining Company (Pty) Ltd – operating as Cooke 4 Shaft Environmental Management Programme	Life of Mine	The EMP indicates that the life of mine (LoM) plan is until 2020. However, the Business Plan profile which includes Inferred and Projects cover the period to 2027.	■ According to the Minutes of the Meeting held on 20 August 2018, the LoM is until 2027, however the mine is currently in care and maintenance until commissioning of the WRTRP ■ It was also indicated in the same meeting that an application process for partial closure of the mine (underground workings) is underway. As part of this process a detailed closure plan is being developed by Jones and Wagener. If possible, the 2018 closure planning and costing update conducted by Golder should be aligned with the closure planning and costing being undertaken by J&W

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
Shangoni. 2015. Ezulwini Mining Company (Pty) Ltd – operating as Cooke 4 Shaft Environmental Management Programme	Sensitive landscapes	The EMP indicates that artificial wetlands are associated with the TSF and plant/shaft areas, including the furrow from the Peter Wright Dam (PWD) (dirty water dam) flowing in a southern direction. Other sensitive landscapes include the ridge systems and associated vegetation types on the mine site.	■ For unscheduled closure, provision needs to be made for the remediation of wetlands and watercourses impacted by the mine's activities. The mine has recently received a General Authorisation for the remediation of the Klein Wes Rietspruit wetland. The closure planning and costing must make provision for the implementation of the remediation plan as outlined in the technical reports that have been compiled in support of the GA issued (Fraser Alexander, 2016; Sibanye-Stillwater, 2018) (see recommendations further below)
Shangoni. 2015. Ezulwini Mining Company (Pty) Ltd – operating as Cooke 4 Shaft Environmental Management Programme	River diversions	The EMP indicates that the PWD is considered a diversion to the KWRS as it has had an influence on the flow from the eye of the spruit to the point where the stream leaves the property.	
Shangoni. 2015. Ezulwini Mining Company (Pty) Ltd – operating as Cooke 4 Shaft Environmental Management Programme	Heritage resources	The EMP indicates that a number of informal cemeteries as well as sites/structures of historic significance are located within the MR area.	■ The closure planning and costing must make provision for the development of a heritage resources management plan for the decommissioning and closure phases

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
			■ The end land use plan to be developed must take into account the exiting heritage resources on site
Shangoni. 2015. Ezulwini Mining Company (Pty) Ltd – operating as Cooke 4 Shaft Environmental Management Programme	Hazardous substances management	■ The EMP indicates that there is an oil storage area and diesel tanks situated within or just outside the plant complex. ■ In addition, the EMP indicates that an asbestos clearance survey conducted at the Cooke 4 Operation Plant area in October 2014 indicated that all readings were below the action level of 0.1f/ml and no regulated fibres were detected. The grab sample of the ceiling board indicated the presence of Chrysotile Asbestos but no airborne fibres were detected in the airborne samples. ■ A radioactive waste material management facility is located at the Shaft Complex. The mine is also a holder of a Certificate of Registration as required by the National Nuclear Radiation act, 1999 (Act No 47 of 1999) (NNRA).	■ Closure planning and costing must make provision for the disposal of hazardous substances at closure. This aspect should also be included in the operational rehabilitation plan to be developed ■ Closure planning and costing must also make provision for undertaking a radiological land release survey
Shangoni. 2015. Ezulwini Mining Company (Pty) Ltd – operating as Cooke 4 Shaft Environmental Management Programme	Water management	The EMP mentions that mine water ultimately discharged into the Klein Wes Rietspruit (KWRS) first reports via a canal to the PWD via spillway on the north eastern extremity of the dam. The PWD also receives treated domestic wastewater from the Morgan Creek sewage plant (which owned and operated by a third party).	■ For unscheduled closure, provision needs to be made for the implementation of remediation plan as outlined in the technical reports that have been compiled in support of the

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
		Water pumped from underground also reports, via a pipeline, to a holding dam situated to the south west of the mining area. From the holding dam, water is supplied, via a pipeline route, to farming activities situated to the west of the mining area. The balance of the water, not used for irrigation by local farmers, has previously been discharged, via an unlined canal into the Leeuspruit.	GA issued (Fraser Alexander, 2016; Sibanye-Stillwater, 2018) (see recommendations further below) ■ For unscheduled closure, provision must be made for monitoring and investigations to further develop the closure water management strategy, taking into the account the recommendations of the geohydrological study undertaken in support of the partial closure application underway for the underground mine workings (Jones and Wagener, 2017) ■ As part of the development of the closure water management strategy, the potential use of the PWD and associated canals post-closure should be confirmed, taking into account the fact that the PWD is a dam with a safety risk as well as impacts on instream habitats

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
			■ Furthermore, for unscheduled closure, provision should be made for continuing investigations with regard to the remediation of the wetlands associated with Leeuspruit and apportionment of liabilities amongst the various mining companies
Shangoni. 2015. Ezulwini Mining Company (Pty) Ltd – operating as Cooke 4 Shaft Environmental Management Programme	Closure objectives - general	The EMP sets the following general closure objectives: ■ Residual impacts will be confirmed and management strategies put in place to ensure that these impacts will be adequately dealt with. Environmental damage or residual impacts will be minimised through a public involvement programme, which is aimed at early identification of problems. ■ The physical and chemical stability of any remaining structures, will be such that the risks to the environment will not be increased by naturally occurring forces. ■ The mine will not be abandoned and financial provision for post-closure management and for the maintenance of pollution control measures will be made. ■ The Best Practice Guidelines that is available at the time of closure will be used.	■ The closure plan to be developed must be aligned with the closure objectives stipulated in the EMP, as appropriate

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Shangoni. 2015. Ezulwini Mining Company (Pty) Ltd – operating as Cooke 4 Shaft Environmental Management Programme	Closure objectives - topography	The EMP sets the following topography related closure objective: ■ Reduce the visual impact of the altered topography by a process of sloping, benching (where appropriate) and rehabilitation.	■ The closure plan to be developed must be aligned with the closure objectives stipulated in the EMP. as appropriate
Shangoni. 2015. Ezulwini Mining Company (Pty) Ltd – operating as Cooke 4 Shaft Environmental Management Programme	Closure objectives - soil	The EMP sets the following soil related closure objectives: ■ Prevent the loss of topsoil (where still available). ■ Prevent the mixing of topsoil and subsoil (where still available). ■ Prevent the erosion and subsequent loss of soil.	■ The closure plan to be developed must be aligned with the closure objectives stipulated in the EMP, as appropriate
Shangoni. 2015. Ezulwini Mining Company (Pty) Ltd – operating as Cooke 4 Shaft Environmental Management Programme	Closure objectives – land use	The EMP sets the following land use related closure objectives: ■ As far as practicable, the land will be rehabilitated to its natural state or to a predetermined and agreed state of land use, which conforms to the concept of sustainable development. The most probable final land use will be for grazing or arable farming. The land may also be used for other purposes that may become viable in the time of operation. ■ The decommissioning process must take the final land use into account in order to achieve a sustainable use.	■ The closure plan and end land use plan to be developed must be aligned with the closure objectives stipulated in the EMP, taking into account that the most common surrounding land use is irrigation agriculture

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
Shangoni. 2015. Ezulwini Mining Company (Pty) Ltd – operating as Cooke 4 Shaft Environmental Management Programme	Closure objectives – surface water	The EMP sets the following surface water related closure objectives: ■ To prevent the ponding of surface water. ■ To prevent water siltation from rehabilitated areas. ■ Prevent the contamination of surface water.	■ The closure plan to be developed must be aligned with the closure objectives stipulated in the EMP, as appropriate
Shangoni. 2015. Ezulwini Mining Company (Pty) Ltd – operating as Cooke 4 Shaft Environmental Management Programme	Closure objectives – groundwater	The EMP sets the following groundwater related closure objective: ■ Prevent the contamination of downstream groundwater resources.	■ The closure plan to be developed must be aligned with the closure objectives stipulated in the EMP, as appropriate
Shangoni. 2015. Ezulwini Mining Company (Pty) Ltd – operating as Cooke 4 Shaft Environmental Management Programme	Closure objectives – sensitive landscapes	The EMP sets the following groundwater related closure objectives: ■ Prevent the loss / destruction of sensitive landscapes. ■ Prevent the occurrence siltation and sedimentation within sensitive landscapes. ■ Preserve any ecological corridors.	■ The closure plan to be developed must be aligned with the closure objectives stipulated in the EMP, as appropriate
Shangoni. 2015. Ezulwini Mining Company (Pty) Ltd – operating as Cooke 4 Shaft	Closure objectives – vegetation	The EMP sets the following vegetation related closure objectives: ■ To re-vegetate the land for erosion control. ■ Special care should be given to:	■ The closure plan to be developed must be aligned with the closure objectives stipulated in the EMP, as appropriate

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
Environmental Management Programme		▪ Quality of vegetation (only indigenous vegetation should be used). ▪ Any noxious plants and exotic plants that have established themselves and that have to be removed. ▪ Any signs of erosion. ▪ Corrective measures need to be taken depending on the problems identified. ■ Preserve any ecological corridors. ■ Removal of all alien invader and weed species. ■ Prevent the illegal harvesting of protected or threatened plant species.	
Shangoni. 2015. Ezulwini Mining Company (Pty) Ltd – operating as Cooke 4 Shaft Environmental Management Programme	Closure objectives – animal life	The EMP sets the following animal life related closure objectives: ■ Prevent the loss of faunal species. ■ Prevent hunting and poaching. ■ Preserve the ecological corridors. ■ Prevent the destruction of habitats.	■ The closure plan to be developed must be aligned with the closure objectives stipulated in the EMP, as appropriate
Shangoni. 2015. Ezulwini Mining Company (Pty) Ltd – operating as Cooke 4 Shaft	Closure objectives – air quality	The EMP sets the following air quality related closure objective: ■ To return air quality to pre-mining levels.	■ The closure plan to be developed must be aligned with the closure

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
Environmental Management Programme			objectives stipulated in the EMP, as appropriate
Shangoni. 2015. Ezulwini Mining Company (Pty) Ltd – operating as Cooke 4 Shaft Environmental Management Programme	Closure objectives – visual aspects	The EMP sets the following visual related closure objective: ■ To return the sense of place of the area, as far as possible, to pre-mining conditions.	■ The closure plan to be developed must be aligned with the closure objectives stipulated in the EMP, as appropriate
Shangoni. 2015. Ezulwini Mining Company (Pty) Ltd – operating as Cooke 4 Shaft Environmental Management Programme	Closure objectives – cultural heritage	The EMP sets the following cultural heritage related closure objective: ■ To promote the conservation of any cultural or heritage resource.	■ The closure plan to be developed must be aligned with the closure objectives stipulated in the EMP, as appropriate
Shangoni. 2015. Ezulwini Mining Company (Pty) Ltd – operating as Cooke 4 Shaft Environmental Management Programme	Closure objectives – socio-economic	The EMP sets the following socio-economic related closure objectives: ■ The mine will be closed efficiently and cost effectively. ■ Improve quality of education and training (including training on saving initiatives for employees). ■ Ensuring that employees obtain the necessary skills in portable competencies, which relate to existence outside the mining environment and which can be applied to sustain individuals and communities once mining operations cease.	■ The closure plan to be developed must be aligned with the closure objectives stipulated in the EMP, as appropriate

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
		■ Continuous engagement and communication with I&APs. ■ Prevent / mitigate against the disturbance of I&APs. ■ Ensure the safety and health of surrounding communities.	
Shangoni. 2015. Ezulwini Mining Company (Pty) Ltd – operating as Cooke 4 Shaft Environmental Management Programme	Infrastructure demolition	The EMP stipulates the following measures for infrastructure areas: ■ The processing plants will most likely be demolished during the Decommissioning Phase and the surface area rehabilitated. ■ Steel buildings and structures, as well as concrete buildings or structures will be demolished (if no other alternative use is identified during the Operational Phase). ■ The living quarters / units, will most likely be made available to the regional services council / regional governmental body for use to curb the housing shortage at a reasonable price. ■ The Sewage Treatment Plant will most likely remain in place. ■ Roads and fences will be removed and the area conditioned to the as close to the pre-mining state as possible, unless an alternative use is identified during the remainder of the Operational Phase. The EMP also stipulates that concrete foundations will be removed to 1 m below natural ground level.	■ The closure measures and hence closure costing, should be aligned with these requirements, where appropriate, however, measures related to underground infrastructure specifically should be more aligned to the detailed measures provided for in the partial closure plan ■ Provision must also be made for a study to identify infrastructure that could be used beneficially by third parties as well as identify suitable third parties for responsibility transfer and related agreements ■ Note: the sewage plant is owned and operated by a third party and hence must be excluded from the closure costing

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
Shangoni. 2015. Ezulwini Mining Company (Pty) Ltd – operating as Cooke 4 Shaft Environmental Management Programme	Radiation decontamination of the plant	The EMP stipulates that waste categorisation will be performed in terms of the NNR operational limitations. A radiation closeout survey should be done aimed at obtaining NNR land clearance.	■ Closure planning and costing must make provision for undertaking a radiological land release survey
Shangoni. 2015. Ezulwini Mining Company (Pty) Ltd – operating as Cooke 4 Shaft Environmental Management Programme	Water management	The EMP stipulates the following closure measures with regard to underground workings: ■ Underground workings will be sealed. ■ The cessation of dewatering operations would mean that one of two routes could be taken. The pumping infrastructure could be maintained by South Deep Mine or be stopped altogether. Water doors on 50 and 58 level will be closed and the water table would rise in the Gemsbokfontein West Sub-Compartment (GWSC). ■ Monitoring will continue for a period of plus-minus 5 years after water level has returned to the natural level prior to dewatering. ■ No abstraction from the Gemsbokfontein East Sub-Compartment (GESC) should be allowed, including Rand Water. ■ EMC is actively involved in the Far West Rand Dolomitic Water Association (FWRDWA), as well as the Far Western Basin Technical Working Group (FWBTWG) (as convened by	■ The closure and rehabilitation measures and monitoring requirements informing the closure costs must be reviewed in light of these requirements as well as the recommendations of the geohydrological study done as part of the partial closure application underway for the underground workings (Jones and Wagener, 2017) (see below for details) ■ Note: the FWRDWA and FWBTWG currently function as administrative bodies. The closure plan to be developed must however be aligned with the regional approach to mine closure, as far as possible

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
		the DMR) and as such is committed to the regional approach to mine closure as relates to water management.	
Shangoni. 2015. Ezulwini Mining Company (Pty) Ltd – operating as Cooke 4 Shaft Environmental Management Programme	TSF rehabilitation	The EMP indicates that there are two TSF's at the complex, an operational TSF and a dormant/closed TSF which has been partially grassed. The EMP also indicates that the dormant TSF does not form part of the MR for Ezulwini. The EMP indicates that the seepage from the TSF will be diverted to the PWD. The EMP makes the following commitments with regards to TSF rehabilitation: ■ The penstock intakes and outlets will be sealed. ■ Piping and valves will be removed. ■ If conducive to the slimes material, vegetation or some other mechanism will be initiated on the TSF side slopes to control erosion, and prevent excess dust dispersion. ■ On completion of the closure and rehabilitation measures, an aftercare programme shall be implemented to ensure that the closure measures are performing adequately and that no further closure liabilities arise. ■ The typical aftercare activities for the TSF will include:	■ For unscheduled closure, it will be assumed that the operational TSF (Ezulwini North) footprint as per the latest survey will be rehabilitated in line with the requirements of the EMP ■ For scheduled closure, provision will be made for rehabilitation of the operational TSF (Ezulwini North) at EMC, in line with the requirements of the EMP, as appropriate. The use of the PWD as part of the closure water strategy for the mine will need to be confirmed ■ Provision for the rehabilitation of Cooke 4# TSF will be made in the closure cost update for RUSO, taking into account the fact that the TSF will be reprocessed as part of the WRTRP

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
		▪ Monitoring of the closure measures to ascertain whether they are performing adequately, failing which some remediation work would be required e.g. successful establishment of top surface vegetation, erosion control etc. ▪ Monitoring the phreatic surface in the TSF and the quality and quantity of seepage water exiting the toe drains; ▪ Ensuring that the seepage cut-off trench pumps and pipes are still operating efficiently; ▪ Remediation of the seepage water collected in the RWD (if required); and ▪ Repair areas that have degraded since closure.	
Shangoni. 2015. Ezulwini Mining Company (Pty) Ltd – operating as Cooke 4 Shaft Environmental Management Programme	WRD rehabilitation	The EMP indicates the following options for the Waste Rock Dump: ■ If financially viable the Waste Rock Dump (WRD) will be mined at the end of LoM and the footprint rehabilitated, ■ The WRD may be stabilised and left intact, or ■ The WRD may be disposed of to a third party for reclamation, with the 3rd party undertaking to rehabilitate the footprint.	■ Note: The WRD is still actively used for stockpiling and removal of rock, however a portion of the rock dump has largely been removed (Sibanye-Stillwater, 2018) ■ For unscheduled closure, it will be assumed that the WRD will be rehabilitated in line with the

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			requirements of the EMP, based on the latest surveyed footprint ■ For scheduled closure, it will be assumed that no final WRD will be present at closure, as all waste rock would have been recovered during operations through beneficial uses, and /or used for backfilling the shafts and general surface rehabilitation
Shangoni. 2015. Ezulwini Mining Company (Pty) Ltd – operating as Cooke 4 Shaft Environmental Management Programme	Disposal facilities / structures (pipes, solution trenches, return water structures)	The EMP indicates that at closure: ■ All unwanted over-land and sub-surface pipelines and associated concrete works will be demolished. ■ TSF pipelines will be removed and the routes rehabilitated to natural status upon decommissioning of the TSFs. ■ A closed circuit shall be in operation to cater for the seepage and run-off rainwater up to the time that natural seepage is handled by normal evaporation. ■ The reticulation system for those areas to be retained will be left in place.	■ The closure and rehabilitation measures informing the closure costs must be reviewed in light of these requirements

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Shangoni. 2015. Ezulwini Mining Company (Pty) Ltd – operating as Cooke 4 Shaft Environmental Management Programme	General surface rehabilitation	The EMP stipulates the following requirements with regard to general surface rehabilitation: ■ Exposure of un-vegetated areas as a result of demolished infrastructure shall be kept to a minimum and rehabilitated as timeously as possible. ■ Dust control measures shall be adopted in critical locations. ■ Pollution of rehabilitated land during LoM shall be addressed and eliminated. ■ Natural drainage patterns shall be re-instituted where possible and will not be interfered with. ■ Voids shall be filled with soil. ■ If any cracks on ground surface, sink holes or storm-water management occurs on the mine, equipment shall be used to create berm walls around sink holes, manage storm-water and fill cracks in the ground.	■ The closure and rehabilitation measures informing the closure costs must be reviewed in light of these requirements
Shangoni. 2015. Ezulwini Mining Company (Pty) Ltd – operating as Cooke 4 Shaft	Post-closure objectives	The objective for the post-closure land use is to rehabilitate the land to a stable condition. Other objectives include: ■ Prior to mine closure; a detailed risk assessment will be conducted to determine the potential residual and latent impacts associated with the Closure Phase of the mine, so as	■ The closure plan to be developed must be aligned with the closure objectives stipulated in the EMP, as appropriate

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
		to ensure the identification, investigation and implementation of suitable mitigation prior to Closure. ■ A Closure plan will be developed in accordance with the requirements of the MPRDA and NEMA. Furthermore, Closure objectives will be set in accordance with Regulation 61 and 62(a) of the MPRDA Regulations. ■ In order to ensure that rehabilitation was effective; aftercare maintenance of the site will take place after Closure operations have ceased for a period as proposed within the Closure plan and in accordance with the relevant legislation, at that time. ■ The rehabilitation will continuously be monitored to determine whether the practices are effective. ■ If erosion and limited re-vegetation takes place, a detailed assessment of the rehabilitation strategies will be done, and where required, alternative strategies will be implemented. ■ Once the rehabilitation activities have ceased, annual monitoring will take place by a rehabilitation specialist (with assistance from other required specialists if needed) to ensure that rehabilitation was effective (for a period of 3 years or as proposed within the Closure plan).	

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
		■ Monitoring programmes will continue Post-closure for a period of 3 years or as per period proposed within the Closure plan.	
Shangoni. 2015. Ezulwini Mining Company (Pty) Ltd – operating as Cooke 4 Shaft Environmental Management Programme	Rehabilitation plan	The EMP specifies that a detailed plan with regards to rehabilitation of the mine must be developed by a rehabilitation specialist registered at the South African Council for Natural Scientific Professions. The rehabilitation plan shall include the following as a minimum: ■ Soil sourcing and usage, ■ Vegetation establishment, ■ Most suitable plant and seed mixtures to be utilised, ■ End land use requirements, ■ Long-term erosion prevention, ■ Long-term surface- and storm water management, ■ Confirmatory monitoring, and ■ Security measures.	■ A rehabilitation plan was compiled in 2017 (Golder, 2017). The EMP Audit (Shangoni, 2017) however recommends that the plan be updated to address surface and storm water measures ■ These recommendations will be taken into consideration during the development of the operational rehabilitation plan
Shangoni. 2015. Ezulwini Mining Company (Pty) Ltd – operating as Cooke 4 Shaft	Monitoring effectiveness of rehabilitation	The EMP stipulates the following requirements with regards to monitoring the effectiveness of rehabilitation:	■ The closure and rehabilitation measures and monitoring and maintenance requirements informing the closure costs must

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
Environmental Management Programme		■ Assess species diversity compared to surrounding area and flora study as per EMP. ■ Identify areas of erosion. ■ Identify any invader plant species occurrence on rehabilitated area. ■ Identify disturbed sensitive areas and include these areas in the rehabilitation plan. ■ On a regular basis, verify alignment between the rehabilitation plan and the post mining topography. Furthermore, aspects such as backlog to rehabilitation should also be noted with timeframes within which this will be implemented. ■ For each phase of the rehabilitation, ensure that detailed rehabilitation standards have been defined. Further to this, ensure training on these procedures, with regular audits undertaken to assess compliance against the requirements as set out within these procedures. ■ To ensure sustainability in respect to rehabilitation, and to motivate such, it is critical to conduct at least annual assessments on the effectiveness of rehabilitation, and to track this over time. These assessments will also identify aftercare requirements, and input to future reviews of the rehabilitation standards.	be reviewed in light of these requirements

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
		■ Ensure that records of any effective rehabilitation sign-off are kept on file (critical record). ■ Develop detailed standards for aftercare and maintenance, which must include aspects such as vegetation and soil surveys, erosion inspections and other parameters which will ensure long term sustainability of rehabilitation (develop Aftercare and Maintenance Programme). ■ All rehabilitated land and infrastructures will be maintained as described in the previous sections for a period of 3 years (or as per closure plan) after rehabilitation in that particular area have ceased. ■ Prevent grazing within the first 2 to 3 years after rehabilitation and prevent access to rehabilitated areas until such time that rehabilitation was successful. ■ Post rehabilitation monitoring must be implemented, to assess the effectiveness of rehabilitation measures, and the need for further intervention. ■ During and after rehabilitation, colonisation of the disturbed areas by plants species from the surrounding natural vegetation should be monitored. ■ Monitoring of the rehabilitation success will take place for at least 3 years and will include corrective follow-up action.	

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
		Access to rehabilitated areas will be prevented until such time that rehabilitation is successful	
Shangoni. 2015. Ezulwini Mining Company (Pty) Ltd – operating as Cooke 4 Shaft Environmental Management Programme	Rehabilitation material	The EMP indicates that topsoil is not currently available on site; an alternative topsoil source will be identified (based on the requirements of the rehabilitation plan). Topsoil alternatives need to be included within the financial provisioning for Closure.	■ The closure cost update make provision for undertaking a rehabilitation material sourcing investigation
Shangoni. 2015. Ezulwini Mining Company (Pty) Ltd – operating as Cooke 4 Shaft Environmental Management Programme	Control of invader plants	The EMP indicates the following with regard to control of invader plants: ■ All alien seedlings and saplings must be removed as they become evident for the duration of mine operation and after closure. ■ Manual / mechanical removal is preferred to chemical control. ■ Implement an alien invasive plant monitoring and management plan for Closure whereby the spread of alien and invasive plant species into the rehabilitated areas are regularly removed and re-infestation monitored for at least 3 years.	■ The closure and rehabilitation measures and monitoring and maintenance requirements informing the closure costs must be reviewed in light of these requirements
Department of Water and Sanitation. 2015. Water Use Licence. Licence No. 08/C23D/ABEFGJ/2836	TSF rehabilitation	■ The Licence authorises the use of fissure water for irrigation of the TSF for rehabilitation for the recharge of Gemsbokfontein East dolomitic aquifer.	■ Given that underground pumping of fissure water will cease, an alternative of source of water will need to be sourced for irrigating

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
		■ The Licence also authorises the backfilling of underground mined areas with tailings material (192 000 tons / annum).	the vegetation on the TSF side slopes (e.g. Rand Water supply) ■ It is Golder's understanding that EMC does not plan to backfill underground mine workings with tailings material at EMC, given that EMC is currently applying to cease pumping and close the underground workings. For scheduled closure, provision will be made for rehabilitation of the operational TSF (Ezulwini North) at EMC, in line with the requirements of the EMP, as appropriate
Department of Water and Sanitation. 2015. Water Use Licence. Licence No. 08/C23D/ABEFGJ/2836	Water management / wetland remediation	■ The Licence authorises the discharge of dewatered fissure water into the Klein Wes Rietspruit and Leeuspruit River. ■ The Licence stipulates that that the Licensee must establish mitigation measures on the groundwater contaminated within the area due to seepage from the existing TSF and ensure that the corrective measures are adequately implemented. ■ The Licence also stipulates that the Licensee must submit an updated geohydrological report which includes a	■ For unscheduled closure: ▪ Provision needs to be made for the implementation of remediation plan as outlined in the technical reports that have been compiled in support of the GA issued (Fraser Alexander, 2016; Sibanye-Stillwater, 2018)

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
		hydrocensus, detailing a monitoring plan and programme, a management plan and post-closure management plan.	(see recommendations further below) ▪ Provision should be made for continuing investigations with regard to the remediation of the wetlands associated with Leeuspruit and apportionment of liabilities amongst the various mining companies ▪ Provision must be made for monitoring and investigations to further develop the closure water management strategy, taking into the account the recommendations of the geohydrological study undertaken in support of the partial closure application underway for the underground mine workings (Jones and Wagener, 2017)
Department of Water and Sanitation. 2015. Water Use Licence. Licence No. 08/C23D/ABEFGJ/2836	Closure process	■ The Licensee must at least 180 days prior to the intended closure of any facility, or any portion thereof, notify the Provincial Head of such intention and submit any final	■ This requirement must be included in the legal section of the closure plan to be developed

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
		amendments to the IWWMP and Rehabilitation Plan as well as a final closure plan for approval.	
Department of Water and Sanitation. 2015. Water Use Licence. Licence No. 08/C23D/ABEFGJ/2836	Financial provision	■ The Licensee must make full financial provision for all investigations, designs, construction, operation and maintenance for a water treatment plant should it become a requirement as a long-term water management strategy.	■ This requirement will be included in the closure plan. For the closure costing update, provision must be made for future investigations and monitoring required to inform the development of the long-term water management strategy
Department of Water and Sanitation. 2018. General Authorisation for the remediation and rehabilitation of a wetland in quaternary Catchment 22H, Upper Vaal Water management Area. Ref. No. 27/2/2/C423/4/4	Wetland remediation	■ This authorisation provides for the reclamation and subsequent rehabilitation of the Klein Wes Rietspruit wetland.	■ The closure planning and costing must make provision for the implementation of the remediation plan as outlined in the technical reports that have been compiled in support of the GA issued (Fraser Alexander, 2016; Sibanye-Stillwater, 2018) (see recommendations further below)
Fraser Alexander. 2016. Ezulwini Wetland Clean-up. High Level Method Statement.	Wetland remediation	The report indicates that the Klein Wes Rietspruit will be remediated as follows:	■ The closure planning and costing must make provision for the implementation of the

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
		■ Step 1: Bund walls (earth walls) are to be strategically located around the perimeter of the demarcated area to prevent the ingress of pollutants (dirty water or other). It is assumed for the purposes of this methodology that the mine will implement (if not already) a similar bund wall / surface cut-off drain approach to prevent contaminated water from the surrounding mining infrastructure entering the clean-up site. Current water discharged into the demarcated area will be diverted around the site to be discharged into the Klein Wes Rietspruit downstream of PWD. No water/slurry from within the demarcated area will be allowed to flow outside of the bunded areas. ■ Step 2: The clean-up area is then sub-divided into manageable sections using bund walls. These sections will be cleaned (removal of tailings/waste/pollutants) sequentially and in a controlled manner by either one of two methods, namely: ▪ Load & Haul: removal of oversize material, rock, waste that cannot be hydraulically transferred; ▪ Hydro mining method: wash with water using monitor unit and pump slurry for disposal to the tailings storage facility. Note:	remediation plan as outlined in this technical reports that have been compiled in support of the GA issued (this report and the 2018 rehabilitation plan (Sibanye-Stillwater, 2018 - see recommendations further below)

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
		Foreign material to be placed on a tailings storage facility as specified by the mine. Each section is deemed clean and complete once all foreign matter is removed and the natural material is reached. ■ Step 3: Once the entire demarcated area has been cleaned the internal bund walls will be removed. The topography of the cleaned area is to be shaped and to blend in with the surrounding area. The area will then be rehabilitated in accordance with a Rehabilitation Plan to be developed.	
Sibanye-Stillwater. 2018. Klein Wes Rietspruit Wetland Delineation and Interim Rehabilitation Plan (note the report has not yet been submitted to the Regulator for approval)	Wetland remediation	The report makes the following recommendations for Phase 1 of the remediation plan: ■ Pre-rehab and tailings reclamation: ▪ Ensure a stormwater management plan has been effectively developed and implemented; ▪ Improve stormwater diversion away from the site, particularly where erosion is occurring; ▪ Maintain existing features where possible: Ensure wetland area delineated is separated from upstream inputs through maintenance and/or upgrade of barriers	■ For unscheduled closure, provision must be made for the implementation of these recommendations ■ These recommendations should also be included in the operational rehabilitation plan to be developed

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
		and current stormwater flow paths, where able, to improve separation of flow between areas; and ▪ Wetland soil chemical analyses should be performed to determine the need for reclamation as current water quality suggests that the outlet of the WWTWs discharge into the PWD shows fair water quality with the following exceedances observed: uranium and manganese. ■ Reclamation phase: ▪ Tailings reclamation progression should proceed from upstream, progressing from the RD and drainage line area. If RD area is still to be used improve stormwater management of the RD and residential area to improve clean (residential area) and dirty water (RD area) separation. Divert all water around the impacted site to decrease seepage into the WWTWs Wetland and ultimately the downstream catchment. If the progression takes place as suggested studies for the downstream wetland areas (WWTWs Wetland in particular) can occur concurrently. It should be noted that stormwater management plans must first be established for the upstream areas before reclamation commences; and ▪ Mechanical mining techniques are preferred to hydraulic reclamation so as to reduce the input of water into the system.	

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
		■ Post reclamation (just before completion of reclamation): ▪ Soil studies including quality analyses should be performed to determine the need for further clean-up; and ▪ Detailed rehabilitation studies must be conducted near or directly after the contaminated material has been removed. This study should again assess the PES as well as model the likely PES once the final phase of the rehabilitation has been implemented, to advise regulators and other stakeholders whether the improvement of the wetland was sufficient. Further to this consideration must be given to the downstream watercourse impacts, especially considering the likely changes in the discharge regime at EMC. ■ Water quality monitoring to monitor for any unexpected changes to the system.	
Department of Mineral Resources. 2018. Environmental Authorisation GP 30/5/1/2/3/2/1 (38) MR (for the WRTRP: pipelines, tailings reprocessing and deposition of slurry onto the Ezulwini TSF)	Re-vegetation	The EA stipulates that no exotic plants may be used for rehabilitation purposes. Only indigenous plants of the area must be used.	■ The closure and rehabilitation measures informing the closure costs must be reviewed in light of this requirement

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
Department of Mineral Resources. 2018. Environmental Authorisation GP 30/5/1/2/3/2/1 (38) MR (for the WRTRP: pipelines, tailings reprocessing and deposition of slurry onto the Ezulwini TSF)	Regulatory process	The EA stipulates that decommissioning of individual activities must comply with the EIA Regulation. It also indicates that the holder of an EA must apply for a closure certificate in terms of Section 43 of the MPRDA within 180 days of occurrence of lapsing, abandonment, cancellation, cessation, relinquishment and completion of development.	■ These requirements will be included in the legal section of the closure plan to be developed
Department of Mineral Resources. 2018. Environmental Authorisation GP 30/5/1/2/3/2/1 (38) MR (for the WRTRP: pipelines, tailings reprocessing and deposition of slurry onto the Ezulwini TSF)	Environmental liabilities	The EA indicates that the holder of the EA remains responsible for any environmental liability, pollution or ecological degradation, the pumping and treatment of extraneous water, compliance with the conditions of the EA and the management and sustainable closure thereof until the Minister has issued a Closure certificate in terms of Section 43 of the MPRDA. Where necessary, the Minister may retain a certain portion of the financial provision for residual, health or environmental impacts that might be known in future.	■ These requirements will be included in the legal section of the closure plan to be developed
Digby Wells. 2016. Amendment of the Existing EMP and Inclusion of Listed Activities Associated with Operations at Ezulwini Mining Right Area, Sibanye Gold Limited	Battery limits	The EMP indicates a high grade uranium concentrate, produced at the proposed central processing plant (CPP, to be located at Kloof), will be transported to EMC (50 kilotonnes per month) for the extraction of uranium and gold. The tailings from this process will be deposited on the existing operational Ezulwini North TSF. The report also indicates that the additional 50 kt/m from the CPP will bring the plant up to design capacity. The Ezulwini north TSF was also designed to receive 100 kt/m of tailings material.	■ Since the final TSF dimensions will not increase as a result of the WRTRP, no additional measures and hence financial provisioning will be needed for this facility ■ However, provision will need to be made for the pipeline transporting the concentrated tailings material from the CPP to the Ezulwini Plant (approx. 18 km

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
			in length), once the pipeline has been constructed. Note: ▪ The EMP indicates that the pipeline will be left in situ at closure ▪ Areas affected by the proposed pipeline are to be rehabilitated in accordance with the rehabilitation plan compiled by Digby Wells, 2015.
Letter issued by the DEA, with Ref. No. 14/11/11/PCB/105, dated 02 August 2016	PCB's	The letter confirms that by the year 2023 the mine would have phased out all PCB contaminated materials, as per the mine's PCB phase out plan.	■ For unscheduled closure, provision needs to be made for disposal of PCB contaminated materials
Shangoni. 2017. Environmental Audit Report. Environmental Management Programme (EMPr) for Cooke 4 Operation	Rehabilitation plan	The audit report recommends that the rehabilitation plan (Golder, 2017) be updated to include surface and storm water management measures.	■ The closure plan to be developed must consider the measures contained within the rehabilitation plan and include measures on surface and storm water
Shangoni. 2017. Environmental Audit Report.	Land capability	The audit report indicates that a grazing and burning programme for the remaining natural areas has not been compiled and	■ Closure planning and costing should provide for the

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
Environmental Management Programme (EMPr) for Cooke 4 Operation		implemented, as per the requirements of the EMP. It is recommended in the report that such a programme be developed and implemented.	development of a grazing and burning programme, to support the end land use
Jones and Wagener. 2017. Cessation of Pumping Operations at Ezulwini and Closure of Underground Mine Workings, Partial Closure Plan	Water management	The report indicates the following geohydrological related recommendations: ■ Implementing a dynamic groundwater monitoring programme to verify the model predictions and to make adjustments were necessary and to provide an early warning system that will alert the mine to the following: ▪ Unexpected changes in the groundwater levels, specifically in areas with a risk of sinkhole formation; ▪ Unexpected changes in groundwater quality; and ▪ Changes in the level of the ground surface. ■ The groundwater levels in the revised borehole network should be monitored as follows: ▪ Monthly during the lead-up to the cessation of pumping; ▪ Twice a month during the re-watering process; and ▪ Monthly after the Gemsbokfontein Eye starts flowing for a period of three years. ■ It is also important that the flow meter in the pipeline be repaired and a surface water flow measuring system is in	■ The closure and rehabilitation measures and monitoring requirements informing the closure costs were reviewed in light of these requirements, and have respectively been allowed for in the closure costs, under the post-closure aspects (Item 6 in the closure costs spreadsheet)

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
		place prior to the eye starting to flow. Flow from the Gemsbokfontein Eye is likely to be diffuse and measuring the difference between water exiting the 0.75 m pipeline from Donaldson Dam and entering the 1 m pipeline, may be a way of accounting for the flow volume at the eye. ■ Groundwater quality in the revised monitoring network (only new boreholes BH1-6) should be monitored as follows: ▪ Twice a year during the lead-up to the cessation of pumping; ▪ Twice a year during the re-watering of the mine; ▪ Quarterly during the recovery of the dolomite aquifer and during the first three years after the eye starts flowing.	
Jones and Wagener. 2017. Cessation of Pumping Operations at Ezulwini and Closure of Underground Mine Workings, Partial Closure Plan	Dolomitic stability	The report recommends that the Dolomite Risk Management Strategy must be implemented to mitigate any potential effects to affected parties as a result of the re-watering of the Gemsbokfontein West sub-compartment. This strategy mirrors the process undertaken by the mines during dewatering and must be implemented until the re-watering cycle is complete.	■ The costs were reviewed in light of these requirements and has been allowed for as part of the additional allowances – specialist assessment and studies (Item 5 in the closure costs spreadsheet)
Jones and Wagener. 2017. Cessation of Pumping Operations at Ezulwini and	Water management	The report indicates the following surface water related recommendations: ■ After pumping at Ezulwini ceases the mine should continue to monitor the water quality at the existing monitoring points	■ The closure and rehabilitation measures and monitoring requirements informing the closure costs were reviewed in

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
Closure of Underground Mine Workings, Partial Closure Plan		along the Leeuspruit and Kleinwes Rietspruit to assess the impact of the remaining mine related infrastructure on the surface water regimes associated with the mine. The current water quality monitoring programme has been evaluated and it is recommended that this be continued after pumping stops. This is currently being conducted on a monthly basis and it is recommended that a full chemical suite of variables be analysed at the current frequency. This monitoring should continue for a period of three years after the cessation of pumping, subject to reassessment at the time. ■ The abstraction of water from the PWD will need to continue, such that the dam does not overtop more than once in 50 years, until such time as the wetland upstream of the dam is rehabilitated and it can be shown that the water quality in the dam is in line with the in-stream water quality objectives. If water is abstracted from the dam at a rate of 2 000 m^3/day then the dam would not be expected to spill more than once in fifty years and therefore would comply with the regulations, as stipulated in GNR 704. The effluent from the external sewage treatment plant could be diverted around the PWD and subsequently be made to report directly into the Kleinwes Rietspruit, then the required abstraction rate could be reduced to 1 000 m3/day. This is provided the sewage plant effluent is of an adequate quality, in line with in-stream water quality objectives.	light of these requirements, and have respectively been allowed for in the closure costs, under the post-closure aspects (Item 6 in the closure costs spreadsheet)

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
		■ At the Gemsbokfontein Eye it is recommended that the location of the flow point be monitored and the water quality of the flow water be sampled, together with groundwater monitoring. These water qualities should be assessed to ensure compliance with the Resource Water Quality Objectives for the catchment and to assess the impact of the flow water on the surface water qualities in the Wonderfonteinspruit catchment. This monitoring should continue for three years after the Eye begins to flow, subject to reassessment at the time. In addition, the flow in the 1 m pipeline should be continuously monitored in relation to its capacity within the context of the associated catchment in which it falls.	
Jones and Wagener. 2017. Cessation of Pumping Operations at Ezulwini and Closure of Underground Mine Workings, Partial Closure Plan	Wetlands and ecology	The report indicates the following wetland and ecological related recommendations: ■ The Present Ecological State (PES), Ecological Importance and Sensitivity (EIS) and ecosystem services of the systems continue to be monitored annually for a period of 3 years at select sampling points on the Kleinwes Rietspruit. ■ The monitoring of the Wonderfonteinspruit will need to continue for 3 years after flow from the Eye commences. Sampling points need to be established and assessed prior to pumping ceasing.	■ The closure and rehabilitation measures and monitoring requirements informing the closure costs were reviewed in light of these requirements, and have respectively been allowed for in the closure costs, under the post-closure aspects (Item 6 in the closure costs spreadsheet) ■ A more comprehensive, integrated post-closure water management strategy for the

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
		■ Biomonitoring currently undertaken along the Leeuspruit East by EMC must continue. Bi-annual biomonitoring along the Kleinwes Rietspruit must conintue. In addition, a taxa list of the macroinvertebrates sampled must be included in the monitoring reports. ■ In addition to water quality monitoring it is recommended that sediment samples be taken and assessed. The sediment in the Kleinwes Rietspruit, downstream of the PWD needs to be assessed to determine the contamination levels. If contaminated, it is important that the existing vegetation is monitored as this vegetation is stabilising the sediment. If the vegetation dies back, alternative mitigation measures may need to be investigated to prevent the sediment from being transported further downstream (such as phytoremediation, bioremediation or soil washing). Tailings are to be removed and placed on existing tailings facilities. The Uranium level is likely to remain the same or increase due to lack of dilution effect if tailings are not removed. ■ Settling ponds downstream of all contaminated areas are to be installed to prevent contaminated sludge entering the wetland systems. These settling ponds are to be cleaned on a regular basis in order to maintain capacity, with the contaminated material disposed of in an appropriate manner. The same vegetation monitoring must take place in the Leeuspruit where it is known that the sediment samples	Sibanye Gauteng gold mining complex is currently in the process of being developed. The above and other post-closure water management 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. ■ Costs for the rehabilitation of watercourses impacted by historic mining activities are also included for under General Surface Rehabilitation, notable Items 3.6 – 3.10 in the closure costs spreadsheet

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
		previously taken in 2014 were contaminated and are currently being held in situ by the Phragmites reed beds. ■ Implementation of the rehabilitation plan submitted by EMC (2016) for the wetland areas upstream of the PWD. ■ Erosion was present along both the Leeuspruit and Kleinwes Rietspruit. As the hydrology of the system changes, the vegetation structure and composition is expected to change. This change in vegetation structure may result in times where vegetation cover is scarce and the system is more prone to erosion. Selected photographic sampling points, along both systems should be identified, prior to pumping stopping. Photographs should be taken quarterly, for a period of 3 years. Should evidence of erosion increase, the cause should be investigated and mitigation measures implemented if required. Mitigation measures could include seeding or the planting of vegetation sods to speed up the vegetation succession, or if more severe, the use of gabion structures could be investigated.	

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
Jones and Wagener. 2017. Cessation of Pumping Operations at Ezulwini and Closure of Underground Mine Workings, Partial Closure Plan	Socio-economic	The following socio-economic related recommendations are included in the report: ■ A clear communication strategy to communicate socio-economic impacts of closure to the local community should be established. ■ The shaft entry points must be barricaded and appropriate security measures built around the surface infrastructure to prevent illegal miners from entering the mine. ■ Sibanye must continue engaging in forums in collaboration with local development agents to discuss potential impacts and mitigation measures regarding income losses for farmers and agricultural workers in the agricultural sector.	■ The closure and rehabilitation measures for the closure of the shafts have been devised to ensure that illegal mining does not occur, and will be monitored during the post-closure monitoring phase ■ Communication with stakeholders regarding progress on the closure of Ezulwini will be conducted on an ongoing basis as part of the environmental authorisation process, and associated closure planning update process
Jones and Wagener. 2017. Cessation of Pumping Operations at Ezulwini and Closure of Underground Mine Workings, Partial Closure Plan	Plug Integrity, Boundary Pillar water flow monitoring and seismic monitoring	■ It is recommended in the report that the DMR require the establishment and operation of a Command and Control Monitoring Centre, as a regional centre to monitor, record and respond effectively to all environmental and geomechanics safety data, including the requirements with regards to each mine's (South Deep and EMC) plug integrity, boundary pillar water flow and seismic monitoring. ■ The centre is proposed to be located near to South Deep mine so that access to the underground workings is feasible. This centre will be run 24/7 by an independent monitoring response team and will provide real-time linkage to South	■ Sibanye has established the command and control monitoring station and infrastructure as indicated, and engagement with South Deep in this respect is ongoing.

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
		Deep, EMC and the DMR. The design of this centre must be submitted to the DMR and South Deep for approval within 30 days of authorisation for the cessation of pumping. The following additional measures are applicable to Cooke 3: ■ A monitoring and maintenance programme must be developed for the Cooke 3 – EMC operations plugs once constructed. A seismicity monitoring programme must also be implemented. ■ The installed support at the potential Cooke 3 plug sites was found to be corroded. This support needs to be replaced in the excavations used to access the proposed plug positions, to prevent injury to the persons working at the plug sites. The support in the area where the plugs are to be placed must be removed and barring must be done to expose the intact rock mass. Temporary support must be placed in this area as per the requirements of the miner responsible for this area.	
Jones and Wagener. 2017. Cessation of Pumping Operations at Ezulwini and Closure of Underground Mine Workings, Partial Closure Plan	Contractual agreement with South Deep	The report indicates that there is an agreement between Sibanye Gold Limited and South Deep Joint Venture (South Deep) for the neighbouring South Deep mine, and is referred to as the *Discharge and Uptake of Underground Water Agreement*. Through this agreement, South Deep may abstract up to 10 000 m^3 per day of water from EMC, which is pumped underground water and is discharged to the Leeuspruit, in terms of the South Deep WUL. EMC is required to dispense 10 000 m^3 of underground water per	■ For unscheduled closure, provision was made for continuing investigations with regard to the remediation of the wetlands associated with Leeuspruit and apportionment of liabilities amongst the various mining companies

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
		day to the Leeuspruit indefinitely, until such a date that they notify South Deep in writing of their intention to cease pumping, subject to a notice period of 10 (ten) business days or, at the election of South Deep, subject to a notice period of 24 (twenty-four) hours. Discharge to South Deep was terminated in 2013, with the exception of occasional discharges, when requested by South Deep.	
Jones and Wagener. 2017. Cessation of Pumping Operations at Ezulwini and Closure of Underground Mine Workings, Partial Closure Plan	Partial closure vision	The report indicates that the partial closure vision for the cessation of pumping and termination of underground workings is to return groundwater levels to near premining levels, flow volumes of the Kleinwes Rietspruit and Leeuspruit to near pre-mining flow levels and to recharge the Wonderfonteinspruit with dolomitic water from the Gemsbokfontein Eye. In addition, it is the partial closure vision of this project to develop a safe post partial closure environment, which is not harmful to surrounding communities.	■ The site-wide closure plan to be developed for the mine must be aligned with the closure vision stipulated in the partial closure plan, when it comes to the cessation of pumping specifically
Jones and Wagener. 2017. Cessation of Pumping Operations at Ezulwini and Closure of Underground Mine Workings, Partial Closure Plan	Partial closure objectives	The report indicates the following closure objectives for the cessation of pumping: ■ To cease pumping as soon as possible and terminate underground workings efficiently and cost effectively; ■ To allow the mine and overlaying dolomitic aquifer to recharge to natural, pre-mining groundwater levels;	■ The site-wide closure plan to be developed for the mine must be aligned with the closure objectives stipulated in the partial closure plan, when it comes to the cessation of pumping specifically

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
		■ To return the surface water flow of the Wonderfonteinspruit and Kleinwes Rietspruit and Leeuspruit to close to pre-mining volumes; ■ To provide continuous engagement and communication with stakeholders; ■ To prevent and mitigate against the disturbance of stakeholders; ■ To ensure the safety and health of surrounding communities and adjacent mines; ■ Ensure that the mitigatory measures are implemented to avoid and/or minimise the identified negative environmental impacts and to enhance the positive impact of the project on the environment; and ■ Ensure that a monitoring programme is in place that tracks the effectiveness of the implemented mitigatory measures.	
Jones and Wagener. 2017. Cessation of Pumping Operations at Ezulwini and Closure of Underground Mine Workings, Partial Closure Plan	End land use	The report makes the following statements with regard to the end land use partial closure plan: ■ The land use will remain the same post cessation of pumping, as only the underground workings of EMC operations will be closed. The surface operations will continue. More specifically, EMC has decided to leave the shaft related surface infrastructure in place as it may be re-purposed and	■ The site-wide closure plan and end land use plan to be developed for the mine must be aligned with these statements ■ For unscheduled closure, provision was made for securing the site and cleaning-up /

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
		used in future Sibanye or municipal led community projects as this may have a positive impact on the surrounding community. Until further details are known on the proposed plans for the surface infrastructure at the EMC operations, EMC must undertake to secure the site and clean-up / decontaminate any polluted areas. ■ The Gold Plant at the Sibanye Gold: EMC operations will continue to operate, while the Uranium Plant will be placed under care and maintenance.	decontaminating any polluted areas ■ Provision was also made for further investigation into the beneficial use of the relevant infrastructure by third parties
Jones and Wagener. 2017. Cessation of Pumping Operations at Ezulwini and Closure of Underground Mine Workings, Partial Closure Plan	Underground infrastructure removal	The report indicates that all salvageable underground infrastructure and that which may cause significant pollution, such as hydrocarbons, will be removed and recycled or disposed of. The infrastructure to be removed from underground prior to the cessation of pumping includes: ■ Chemical toilets; ■ Explosives; ■ Fluorescent tubing; ■ Transformers and electrical stations; ■ Transformer oil; ■ Waste drums from workshops (decontaminate workshops); ■ Driving gear; and	■ The closure costs do not include requirements for removing underground equipment as it was assumed that this is funded through a separate process

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
		■ Locomotives. Other infrastructure such as cage/elevator, electrical wiring, conveyors, etc. will remain underground. Before the pumping cessation occurs, three additional plugs are to be constructed in the underground mine workings between Cooke 3 and the EMC operations, to ensure water and contamination leakage does not occur with adjacent mines. The last infrastructure to be removed from underground includes pumps, and substations on pumping levels.	
Jones and Wagener. 2017. Cessation of Pumping Operations at Ezulwini and Closure of Underground Mine Workings, Partial Closure Plan	Monitoring and maintenance	The report indicates recommends the following additional measures: ■ An engineering closure plan and programme must be developed to cater for emergencies and to allow for monitoring and management of the re-watering process. ■ Monitoring of the water levels, water quality and dolomitic stability will continue after the dolomitic aquifer has recharged, for a period of 3 years after the Gemsbokfontein begins to flow (six new boreholes have been drilled to improve the current monitoring systems and to aid in determining the extent of the dewatering cone as well as the groundwater in the dolomite aquifer).	■ The closure and rehabilitation measures and monitoring requirements informing the closure costs were reviewed in light of these requirements, and have respectively been allowed for in the closure costs, under the post-closure aspects (Item 6 in the closure costs spreadsheet)

Info Source	Closure Aspect	Obligation	Closure planning / costing implication(s)
		■ Surface monitoring to detect settlement of ground will continue as before, including some expansion.	
Jones and Wagener. 2017. Cessation of Pumping Operations at Ezulwini and Closure of Underground Mine Workings, Partial Closure Plan	Relinquishment criteria	■ The report stipulates relinquishment criteria associated with the cessation of pumping.	■ The site-wide closure plan to be developed for the mine must be aligned with the relinquishment criteria stipulated in the partial closure plan, when it comes to the cessation of pumping specifically

Closing

The legal obligations and other closure related recommendations outlined in this Memorandum will be taken into consideration during the computation of the closure costing update and formulation of the closure, end land use and operational rehabilitation plans.

Yours sincerely,

Golder Associates Africa (Pty) Ltd

Olivia Allen
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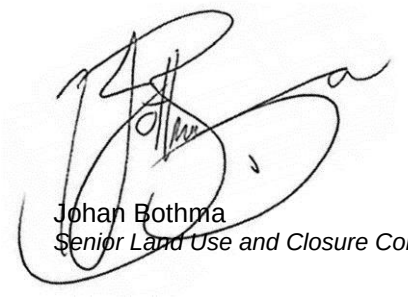

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OA/JB/nbh

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APPENDIX B

Closure costs spreadsheets

1896352 Sibanye Ezulwini Mine Closure Costs, as at December 2018

Ezulwini

Ref.		Closure Component (Select)	Cash flowed costs expensed method	Unscheduled Closure (2018)							Scheduled Closure (2027)						
				Applicable	Quantity	Unit	Unit rate code	Unit rate	Total cost	Notes	Applicable	Quantity	Unit	Unit rate code	Unit rate	Total cost	Notes
Sibanye inventory ref number		Ezulwini															
	1	Infrastructural Areas															
	1.1	Dismantling of processing plant and related structures															
	1.1.1	GOLD PLANT AREA															
817		Uranium plant															
		Dismantling and removal of steel structures	S-curve	Yes	1113	/m²	B1.3	R 1 288.96	R 1 434 612.48	Height: 8m	Yes	1113	/m²	B1.3	R 1 288.96	R 1 434 612.48	Height: 8m
		Demolish concrete bases	S-curve	Yes	1113	/m2	A2.3	R 269.69	R 300 164.97		Yes	1113	/m2	A2.3	R 269.69	R 300 164.97	
818		Substation															
		Removal of single storey brick building	S-curve	Yes	50	/m2	C1	R 391.29	R 19 564.50	Height: 4m	Yes	50	/m2	C1	R 391.29	R 19 564.50	Height: 4m
819		Solvent plant															
		Dismantling and removal of steel structures	S-curve	Yes	259	/m²	B1.2	R 667.80	R 172 960.20	Height: 10m	Yes	259	/m²	B1.2	R 667.80	R 172 960.20	Height: 10m
		Demolish concrete bases	S-curve	Yes	259	/m2	A2.3	R 269.69	R 69 849.71		Yes	259	/m2	A2.3	R 269.69	R 69 849.71	
820		Substation															
		Removal of double storey brick building	S-curve	Yes	174	/m2	C2	R 704.33	R 122 553.42	Height: 6m	Yes	174	/m2	C2	R 704.33	R 122 553.42	Height: 6m
821		Office															
		Removal of single storey brick building	S-curve	Yes	110	/m2	C1	R 391.29	R 43 041.90	Height: 3m	Yes	110	/m2	C1	R 391.29	R 43 041.90	Height: 3m
822		Substation															
		Removal of single storey brick building	S-curve	Yes	162	/m2	C1	R 391.29	R 63 388.98	Height: 3m	Yes	162	/m2	C1	R 391.29	R 63 388.98	Height: 3m
823		Substation															
		Removal of single storey brick building	S-curve	Yes	96	/m2	C1	R 391.29	R 37 563.84	Height: 4m	Yes	96	/m2	C1	R 391.29	R 37 563.84	Height: 4m
824		Workshop															
		Dismantling and removal of steel structures	S-curve	Yes	158	/m2	B3.2	R 132.02	R 20 859.16	Height: 6m	Yes	158	/m2	B3.2	R 132.02	R 20 859.16	Height: 6m
		Demolish concrete bases	S-curve	Yes	158	/m2	A2.3	R 269.69	R 42 611.02		Yes	158	/m2	A2.3	R 269.69	R 42 611.02	
825		Substation															
		Removal of double storey brick building	S-curve	Yes	78	/m2	C2	R 704.33	R 54 937.74	Height: 6m	Yes	78	/m2	C2	R 704.33	R 54 937.74	Height: 6m
826		Water plant															
		Dismantling and removal of steel structures	S-curve	Yes	1031	/m²	B1.2	R 667.80	R 688 501.80	Height: 12m	Yes	1031	/m²	B1.2	R 667.80	R 688 501.80	Height: 12m
		Demolish concrete bases	S-curve	Yes	1031	/m2	A2.3	R 269.69	R 278 050.39		Yes	1031	/m2	A2.3	R 269.69	R 278 050.39	
827		Store															
		Removal of single storey brick building	S-curve	Yes	587	/m2	C1	R 391.29	R 229 687.23	Height: 4m	Yes	587	/m2	C1	R 391.29	R 229 687.23	Height: 4m
828		Ablution															
		Removal of single storey brick building	S-curve	Yes	14	/m2	C1	R 391.29	R 5 478.06	Height: 3m	Yes	14	/m2	C1	R 391.29	R 5 478.06	Height: 3m
829		Valuation room															
		Removal of single storey brick building	S-curve	Yes	86	/m2	C1	R 391.29	R 33 650.94	Height: 4m	Yes	86	/m2	C1	R 391.29	R 33 650.94	Height: 4m
830		Pump / generator room															
		Removal of single storey brick building	S-curve	Yes	528	/m2	C1	R 391.29	R 206 601.12	Height: 4m	Yes	528	/m2	C1	R 391.29	R 206 601.12	Height: 4m
831		Ablution															
		Removal of single storey brick building	S-curve	Yes	45	/m2	C1	R 391.29	R 17 608.05	Height: 3m	Yes	45	/m2	C1	R 391.29	R 17 608.05	Height: 3m
832		Substation															
		Removal of single storey brick building	S-curve	Yes	100	/m2	C1	R 391.29	R 39 129.00	Height: 4m	Yes	100	/m2	C1	R 391.29	R 39 129.00	Height: 4m
833		Smelt house															
		Removal of double storey brick building	S-curve	Yes	166	/m2	C2	R 704.33	R 116 918.78	Height: 5m	Yes	166	/m2	C2	R 704.33	R 116 918.78	Height: 5m
834		Offices															
		Removal of single storey brick building	S-curve	Yes	454	/m2	C1	R 391.29	R 177 645.66	Height: 4m	Yes	454	/m2	C1	R 391.29	R 177 645.66	Height: 4m
835		Substation															
		Removal of single storey brick building	S-curve	Yes	98	/m2	C1	R 391.29	R 38 346.42	Height: 4m	Yes	98	/m2	C1	R 391.29	R 38 346.42	Height: 4m
836		Substation															
		Removal of double storey brick building	S-curve	Yes	35	/m2	C2	R 704.33	R 24 651.55	Height: 6m	Yes	35	/m2	C2	R 704.33	R 24 651.55	Height: 6m
837		Changehouse															
		Removal of single storey brick building	S-curve	Yes	950	/m2	C1	R 391.29	R 371 725.50	Height: 4m	Yes	950	/m2	C1	R 391.29	R 371 725.50	Height: 4m
838		Carport															
		Car ports (IBR roof)	S-curve	Yes	260	/m2	B7.2	R 49.21	R 12 794.60	Height: 2.5m	Yes	260	/m2	B7.2	R 49.21	R 12 794.60	Height: 2.5m
		Demolish concrete bases	S-curve	Yes	260	/m2	E6	R 59.75	R 15 535.00		Yes	260	/m2	E6	R 59.75	R 15 535.00	
839		Carport															
		Car ports (IBR roof)	S-curve	Yes	654	/m2	B7.2	R 49.21	R 32 183.34	Height: 2.5m	Yes	654	/m2	B7.2	R 49.21	R 32 183.34	Height: 2.5m
		Demolish concrete bases	S-curve	Yes	654	/m2	E6	R 59.75	R 39 076.50		Yes	654	/m2	E6	R 59.75	R 39 076.50	
840		Shed															
		Dismantling and removal of steel structures	S-curve	Yes	221	/m2	B3.2	R 132.02	R 29 176.42	Height: 6m	Yes	221	/m2	B3.2	R 132.02	R 29 176.42	Height: 6m
		Demolish concrete bases	S-curve	Yes	221	/m2	A2.6	R 122.28	R 27 023.88		Yes	221	/m2	A2.6	R 122.28	R 27 023.88	
841		Store															
		Removal of single storey brick building	S-curve	Yes	21	/m2	C1	R 391.29	R 8 217.09	Height: 2.5m	Yes	21	/m2	C1	R 391.29	R 8 217.09	Height: 2.5m
842		Substation															
		Removal of double storey brick building	S-curve	Yes	543	/m2	C2	R 704.33	R 382 451.19	Height: 8m	Yes	543	/m2	C2	R 704.33	R 382 451.19	Height: 8m
843		Substation															
		Removal of double storey brick building	S-curve	Yes	223	/m2	C2	R 704.33	R 157 065.59	Height: 8m	Yes	223	/m2	C2	R 704.33	R 157 065.59	Height: 8m
844		Pumphouse															
		Removal of single storey brick building	S-curve	Yes	70	/m2	C1	R 391.29	R 27 390.30	Height: 2.5m	Yes	70	/m2	C1	R 391.29	R 27 390.30	Height: 2.5m
845		Substation															
		Removal of double storey brick building	S-curve	Yes	71	/m2	C2	R 704.33	R 50 007.43	Height: 7m	Yes	71	/m2	C2	R 704.33	R 50 007.43	Height: 7m
846		Shed															
		Dismantling and removal of steel structures	S-curve	Yes	893	/m2	B3.2	R 132.02	R 117 893.86	Height: 8m	Yes	893	/m2	B3.2	R 132.02	R 117 893.86	Height: 8m
		Demolish concrete bases	S-curve	Yes	893	/m2	A2.6	R 122.28	R 109 196.04		Yes	893	/m2	A2.6	R 122.28	R 109 196.04	
847		Ruins															
		Removal of double storey brick building	S-curve	Yes	377	/m2	C2	R 704.33	R 265 532.41	Height: 8m	Yes	377	/m2	C2	R 704.33	R 265 532.41	Height: 8m
848		Pump house															
		Removal of single storey brick building	S-curve	Yes	30	/m2	C1	R 391.29	R 11 738.70	Height: 3m	Yes	30	/m2	C1	R 391.29	R 11 738.70	Height: 3m
		Elution plant	S-curve	Yes	40	/m²	B1.2	R 667.80	R 26 712.00		Yes	40	/m²	B1.2	R 667.80	R 26 712.00	
		Compressor plant	S-curve	Yes	26	/m²	B1.2	R 667.80	R 17 362.80		Yes	26	/m²	B1.2	R 667.80	R 17 362.80	
		Gold Processing Plant	S-curve	Yes	731	/m²	B1.2	R 667.80	R 488 161.80		Yes	731	/m²	B1.2	R 667.80	R 488 161.80	
		Conveyor	S-curve	Yes	120	/m	D1.2.1	R 497.75	R 59 730.00	Measured on Google Earth	Yes	120	/m	D1.2.1	R 497.75	R 59 730.00	Measured on Google Earth
		Conveyor	S-curve	Yes	120	/m	D1.2.1	R 497.75	R 59 730.00	Measured on Google Earth	Yes	120	/m	D1.2.1	R 497.75	R 59 730.00	Measured on Google Earth
		Conveyor	S-curve	Yes	110	/m	D1.2.1	R 497.75	R 54 752.50	Measured on Google Earth	Yes	110	/m	D1.2.1	R 497.75	R 54 752.50	Measured on Google Earth
		Conveyor	S-curve	Yes	110	/m	D1.2.1	R 497.75	R 54 752.50	Measured on Google Earth	Yes	110	/m	D1.2.1	R 497.75	R 54 752.50	Measured on Google Earth
		Hopper clarifiers	S-curve	Yes	3439	/m²	B1.2	R 667.80	R 2 296 564.20		Yes	3439	/m²	B1.2	R 667.80	R 2 296 564.20	
		Leach Plant	S-curve	Yes	1126	/m²	B1.2	R 667.80	R 751 942.80		Yes	1126	/m²	B1.2	R 667.80	R 751 942.80	
		Flock Plant	S-curve	Yes	265	/m²	B1.2	R 667.80	R 176 967.00		Yes	265	/m²	B1.2	R 667.80	R 176 967.00	
	1.2.1	SHAFT AND HOSTEL AREA															
		Concrete Headgear								Concrete structure height of 40m as provided by Sibanye in 2015. Cost determined using separate headgear calculation spreadsheet. Costs were calculated using typical headgear which was proportionately adjusted according to headgear height.							
		Headgear concrete "concrete outer shell"	S-curve	Yes	1	sum	N16	R 937 366.61	R 937 366.61		No	0	sum	N16	R 937 366.61	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
		Headgear "inner steel superstructure"	S-curve	Yes	1	sum	N17	R 513 043.70	R 513 043.70		No	0	sum	N17	R 513 043.70	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
		Headgear - Dismantling and lowering of headgear equipment	S-curve	Yes	1	sum	N18	R 158 300.46	R 158 300.46		No	0	sum	N18	R 158 300.46	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
		Steel Headgear								Concrete structure height of 40m as provided by Sibanye in 2015. Cost determined using separate headgear calculation spreadsheet. Costs were calculated using typical headgear which was proportionately adjusted according to headgear height.							
		Headgear Steel "steel superstructure"	S-curve	Yes	1	sum	N20	R 289 053.37	R 289 053.37		No	0	sum	N20	R 289 053.37	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
		Headgear (plinths)	S-curve	Yes	1	sum	N21	R 53 427.24	R 53 427.24		No	0	sum	N21	R 53 427.24	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
		Headgear - Dismantling and lowering of headgear equipment	S-curve	Yes	1	sum	N22	R 128 614.92	R 128 614.92		No	0	sum	N22	R 128 614.92	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
		Backfill plant	S-curve	Yes	577	/m²	B1.2	R 667.80	R 385 320.60		No	0	/m²	B1.2	R 667.80	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
		Sub-total for Dismantling of processing plant and related structures	S-curve						**R 12 347 187.27**							**R 9 882 060.37**	
	1.2	Demolition of steel buildings and structures															
	1.2.1	GOLD PLANT AREA															
		Tank	S-curve	Yes	1	/tank	B5.4	R 89 187.84	R 89 187.84	Steel tanks	Yes	1	/tank	B5.4	R 89 187.84	R 89 187.84	Steel tanks
		Tank	S-curve	Yes	1	/tank	B5.3	R 48 944.55	R 48 944.55	Steel tanks	Yes	1	/tank	B5.3	R 48 944.55	R 48 944.55	Steel tanks
		Tank	S-curve	Yes	1	/tank	B5.4	R 89 187.84	R 89 187.84	Steel tanks	Yes	1	/tank	B5.4	R 89 187.84	R 89 187.84	Steel tanks
		Tank	S-curve	Yes	1	/tank	B5.7	R 5 911.18	R 5 911.18	Steel tanks	Yes	1	/tank	B5.7	R 5 911.18	R 5 911.18	Steel tanks
		Tank	S-curve	Yes	1	/tank	B5.2	R 22 417.81	R 22 417.81	Steel tanks	Yes	1	/tank	B5.2	R 22 417.81	R 22 417.81	Steel tanks
		Tank	S-curve	Yes	1	/tank	B5.2	R 22 417.81	R 22 417.81	Steel tanks	Yes	1	/tank	B5.2	R 22 417.81	R 22 417.81	Steel tanks
		Tank	S-curve	Yes	1	/tank	B5.2	R 22 417.81	R 22 417.81	Steel tanks	Yes	1	/tank	B5.2	R 22 417.81	R 22 417.81	Steel tanks
		Tank	S-curve	Yes	1	/tank	B5.7	R 5 911.18	R 5 911.18	Steel tanks	Yes	1	/tank	B5.7	R 5 911.18	R 5 911.18	Steel tanks
		Tanks	S-curve	Yes	3	/tank	B5.7	R 5 911.18	R 17 733.54	Assumed steel from Google Earth	Yes	3	/tank	B5.7	R 5 911.18	R 17 733.54	Assumed steel from Google Earth
		Water tank	S-curve	Yes	1	/tank	B5.7	R 5 911.18	R 5 911.18	Steel tanks	Yes	1	/tank	B5.7	R 5 911.18	R 5 911.18	Steel tanks
		Tank	S-curve	Yes	1	/tank	B5.7	R 5 911.18	R 5 911.18	Steel tanks	Yes	1	/tank	B5.7	R 5 911.18	R 5 911.18	Steel tanks
		Tank	S-curve	Yes	1	/tank	B5.3	R 48 944.55	R 48 944.55	Steel tanks	Yes	1	/tank	B5.3	R 48 944.55	R 48 944.55	Steel tanks
		Tank	S-curve	Yes	1	/tank	B5.3	R 48 944.55	R 48 944.55	Steel tanks	Yes	1	/tank	B5.3	R 48 944.55	R 48 944.55	Steel tanks
		Tank	S-curve	Yes	1	/tank	B5.3	R 48 944.55	R 48 944.55	Steel tanks	Yes	1	/tank	B5.3	R 48 944.55	R 48 944.55	Steel tanks
		Tank	S-curve	Yes	1	/tank	B5.3	R 48 944.55	R 48 944.55	Assumed steel from Google Earth	Yes	1	/tank	B5.3	R 48 944.55	R 48 944.55	Assumed steel from Google Earth
		Tank	S-curve	Yes	1	/tank	B5.3	R 48 944.55	R 48 944.55	Assumed steel from Google Earth	Yes	1	/tank	B5.3	R 48 944.55	R 48 944.55	Assumed steel from Google Earth
		Tank	S-curve	Yes	1	/tank	B5.3	R 48 944.55	R 48 944.55	Assumed steel from Google Earth	Yes	1	/tank	B5.3	R 48 944.55	R 48 944.55	Assumed steel from Google Earth
	1.2.2	SHAFT AND HOSTEL AREA															
689		Shed															Assume demolished by scheduled closure as shaft has been decommissioned (2017)
		Car ports (IBR roof)	S-curve	Yes	130	/m2	B7.2	R 49.21	R 6 397.30	Height: 3m	No	130	/m2	B7.2	R 49.21	R 0.00	
		Demolish concrete bases	S-curve	Yes	130	/m2	E6	R 59.75	R 7 767.50		No	130	/m2	E6	R 59.75	R 0.00	
690		Store															
		Removal of single storey brick building	S-curve	Yes	134	/m2	C1	R 391.29	R 52 432.86	Height: 2.5m	No	134	/m2	C1	R 391.29	R 0.00	
691		Lamproom															
		Removal of double storey brick building	S-curve	Yes	2252	/m2	C2	R 704.33	R 1 586 151.16	Height: 5m	No	2252	/m2	C2	R 704.33	R 0.00	
692		Store															
		Removal of single storey brick building	S-curve	Yes	100	/m2	C1	R 391.29	R 39 129.00	Height: 2.5m	No	100	/m2	C1	R 391.29	R 0.00	
693		Winder house															
		Dismantling and removal of steel structures	S-curve	Yes	498	/m²	B1.3	R 1 288.96	R 641 902.08	Height: 15m	No	498	/m²	B1.3	R 1 288.96	R 0.00	
		Demolish concrete bases	S-curve	Yes	498	/m2	A2.4	R 385.27	R 191 864.46		No	498	/m2	A2.4	R 385.27	R 0.00	
694		Headgear															
		Dismantling and removal of steel structures	S-curve	No	0	/m²	B1.3	R 1 288.96	R 0.00	Included under section 1.2.1	No	0	/m²	B1.3	R 1 288.96	R 0.00	
		Demolish concrete bases	S-curve	No	0	/m2	A2.4	R 385.27	R 0.00		No	0	/m2	A2.4	R 385.27	R 0.00	
695		Shed															
		Dismantling and removal of steel structures	S-curve	Yes	346	/m2	B3.2	R 132.02	R 45 678.92	Height: 6m	No	346	/m2	B3.2	R 132.02	R 0.00	
		Demolish concrete bases	S-curve	Yes	346	/m2	A2.3	R 269.69	R 93 312.74		No	346	/m2	A2.3	R 269.69	R 0.00	
696		Shunting engine room															
		Removal of single storey brick building	S-curve	Yes	8	/m2	C1	R 391.29	R 3 130.32	Height: 1.5m	No	8	/m2	C1	R 391.29	R 0.00	
697		Control rooms															
		Removal of double storey brick building	S-curve	Yes	119	/m2	C2	R 704.33	R 83 815.27	Height: 7m	No	119	/m2	C2	R 704.33	R 0.00	
698		Waiting room															
		Removal of single storey brick building	S-curve	Yes	12	/m2	C1	R 391.29	R 4 695.48	Height: 2.5m	No	12	/m2	C1	R 391.29	R 0.00	
699		Winder house															
		Dismantling and removal of steel structures	S-curve	Yes	395	/m²	B1.3	R 1 288.96	R 509 139.20	Height: 6m	No	395	/m²	B1.3	R 1 288.96	R 0.00	
		Demolish concrete bases	S-curve	Yes	395	/m2	A2.3	R 269.69	R 106 527.55		No	395	/m2	A2.3	R 269.69	R 0.00	
700		Pumphouse															
		Removal of single storey brick building	S-curve	Yes	16	/m2	C1	R 391.29	R 6 260.64	Height: 2.5m	No	16	/m2	C1	R 391.29	R 0.00	
701		Store															
		Dismantling and removal of steel structures	S-curve	Yes	8	/m2	B3.1	R 75.04	R 600.32	Height: 2.5m	No	8	/m2	B3.1	R 75.04	R 0.00	
		Demolish concrete bases	S-curve	Yes	8	/m2	A2.6	R 122.28	R 978.24		No	8	/m2	A2.6	R 122.28	R 0.00	
702		Ventilation fans															

1896352 Sibanye Ezulwini Mine Closure Costs, as at December 2018
Ezulwini

Ref.	Closure Component	Cash flowed costs expensed method	Unscheduled Closure (2018)							Scheduled Closure (2027)						
			Applicable	Quantity	Unit	Unit rate code	Unit rate	Total cost	Notes	Applicable	Quantity	Unit	Unit rate code	Unit rate	Total cost	Notes
	Removal of single storey brick building	S-curve	Yes	567	/m2	C1	R 391.29	R 221 861.43	Height: 4m	No	567	/m2	C1	R 391.29	R 0.00	
	Dismantling and removal of steel structures	S-curve	Yes	567	/m2	B3.1	R 75.04	R 42 547.68		No	567	/m2	B3.1	R 75.04	R 0.00	
703	Compressor shop															
	Dismantling and removal of steel structures	S-curve	Yes	32	/m2	B3.1	R 75.04	R 2 401.28	Height: 2.5m	No	32	/m2	B3.1	R 75.04	R 0.00	
	Demolish concrete bases	S-curve	Yes	32	/m2	A2.6	R 122.28	R 3 912.96		No	32	/m2	A2.6	R 122.28	R 0.00	
704	Store															
	Removal of single storey brick building	S-curve	Yes	68	/m2	C1	R 391.29	R 26 607.72	Height: 2.5m	No	68	/m2	C1	R 391.29	R 0.00	
705	Workshop															
	Removal of single storey brick building	S-curve	Yes	416	/m2	C1	R 391.29	R 162 776.64	Height: 4m	No	416	/m2	C1	R 391.29	R 0.00	
706	Ablution															
	Removal of single storey brick building	S-curve	Yes	33	/m2	C1	R 391.29	R 12 912.57	Height: 2.5m	No	33	/m2	C1	R 391.29	R 0.00	
707	Office															
	Removal of single storey brick building	S-curve	Yes	16	/m2	C1	R 391.29	R 6 260.64	Height: 2.5m	No	16	/m2	C1	R 391.29	R 0.00	
708	Office															
	Removal of single storey brick building	S-curve	Yes	26	/m2	C1	R 391.29	R 10 173.54	Height: 2.5m	No	26	/m2	C1	R 391.29	R 0.00	
709	Store															
	Dismantling and removal of steel structures	S-curve	Yes	122	/m2	B3.1	R 75.04	R 9 154.88	Height: 5m	No	122	/m2	B3.1	R 75.04	R 0.00	
	Demolish concrete bases	S-curve	Yes	122	/m2	A2.6	R 122.28	R 14 918.16		No	122	/m2	A2.6	R 122.28	R 0.00	
710	Office															
	Removal of single storey brick building	S-curve	Yes	396	/m2	C1	R 391.29	R 154 950.84	Height: 3m	No	396	/m2	C1	R 391.29	R 0.00	
711	Winder house															
	Dismantling and removal of steel structures	S-curve	Yes	692	/m²	B1.3	R 1 288.96	R 891 960.32	Height: 15m	No	692	/m²	B1.3	R 1 288.96	R 0.00	
	Demolish concrete bases	S-curve	Yes	692	/m2	A2.3	R 269.69	R 186 625.48		No	692	/m2	A2.3	R 269.69	R 0.00	
712	Workshop															
	Dismantling and removal of steel structures	S-curve	Yes	550	/m2	B3.1	R 75.04	R 41 272.00	Height: 4m	No	550	/m2	B3.1	R 75.04	R 0.00	
	Demolish concrete bases	S-curve	Yes	550	/m2	A2.3	R 269.69	R 148 329.50		No	550	/m2	A2.3	R 269.69	R 0.00	
713	Workshop															
	Dismantling and removal of steel structures	S-curve	Yes	175	/m2	B3.2	R 132.02	R 23 103.50	Height: 6m	No	175	/m2	B3.2	R 132.02	R 0.00	
	Demolish concrete bases	S-curve	Yes	175	/m2	A2.6	R 122.28	R 21 399.00		No	175	/m2	A2.6	R 122.28	R 0.00	
714	Oil store															
	Removal of single storey brick building	S-curve	Yes	24	/m2	C1	R 391.29	R 9 390.96	Height: 2.5m	No	24	/m2	C1	R 391.29	R 0.00	
715	Compressor house															
	Dismantling and removal of steel structures	S-curve	Yes	1950	/m²	B1.2	R 667.80	R 1 302 210.00	Height: 12m	No	1950	/m²	B1.2	R 667.80	R 0.00	
	Demolish concrete bases	S-curve	Yes	1950	/m2	A2.3	R 269.69	R 525 895.50		No	1950	/m2	A2.3	R 269.69	R 0.00	
716	Workshop															
	Dismantling and removal of steel structures	S-curve	Yes	2799	/m²	B1.2	R 667.80	R 1 869 172.20	Height: 8m	No	2799	/m²	B1.2	R 667.80	R 0.00	
	Demolish concrete bases	S-curve	Yes	2799	/m2	A2.3	R 269.69	R 754 862.31		No	2799	/m2	A2.3	R 269.69	R 0.00	
717	Store															
	Removal of single storey brick building	S-curve	Yes	48	/m2	C1	R 391.29	R 18 781.92	Height: 2.5m	No	48	/m2	C1	R 391.29	R 0.00	
718	Shed															
	Dismantling and removal of steel structures	S-curve	Yes	10	/m2	B3.1	R 75.04	R 750.40	Height: 2m	No	10	/m2	B3.1	R 75.04	R 0.00	
	Demolish concrete bases	S-curve	Yes	10	/m2	A2.6	R 122.28	R 1 222.80		No	10	/m2	A2.6	R 122.28	R 0.00	
719	Shed															
	Dismantling and removal of steel structures	S-curve	Yes	40	/m2	B3.1	R 75.04	R 3 001.60	Height: 4m	No	40	/m2	B3.1	R 75.04	R 0.00	
	Demolish concrete bases	S-curve	Yes	40	/m2	A2.6	R 122.28	R 4 891.20		No	40	/m2	A2.6	R 122.28	R 0.00	
720	Store															
	Removal of single storey brick building	S-curve	Yes	42	/m2	C1	R 391.29	R 16 434.18	Height: 3.5m	No	42	/m2	C1	R 391.29	R 0.00	
721	Ablution															
	Removal of single storey brick building	S-curve	Yes	73	/m2	C1	R 391.29	R 28 564.17	Height: 2.5m	No	73	/m2	C1	R 391.29	R 0.00	
722	Radiation bay															
	Removal of single storey brick building	S-curve	Yes	68	/m2	C1	R 391.29	R 26 607.72	Height: 3m	No	68	/m2	C1	R 391.29	R 0.00	
723	Store															
	Removal of single storey brick building	S-curve	Yes	44	/m2	C1	R 391.29	R 17 216.76	Height: 3m	No	44	/m2	C1	R 391.29	R 0.00	
724	Shed															
	Removal of single storey brick building	S-curve	Yes	582	/m2	C1	R 391.29	R 227 730.78	Height: 3m	No	582	/m2	C1	R 391.29	R 0.00	
725	Proto room															
	Removal of single storey brick building	S-curve	Yes	71	/m2	C1	R 391.29	R 27 781.59	Height: 3m	No	71	/m2	C1	R 391.29	R 0.00	
726	Ablution															
	Removal of single storey brick building	S-curve	Yes	37	/m2	C1	R 391.29	R 14 477.73	Height: 3m	No	37	/m2	C1	R 391.29	R 0.00	
727	Substation															
	Removal of single storey brick building	S-curve	Yes	284	/m2	C1	R 391.29	R 111 126.36	Height: 4m	No	284	/m2	C1	R 391.29	R 0.00	
728	Changehouse															
	Removal of single storey brick building	S-curve	Yes	332	/m2	C1	R 391.29	R 129 908.28	Height: 3m	No	332	/m2	C1	R 391.29	R 0.00	
729	Office															
	Removal of single storey brick building	S-curve	Yes	342	/m2	C1	R 391.29	R 133 821.18	Height: 3m	No	342	/m2	C1	R 391.29	R 0.00	
730	Pumphouse															
	Removal of single storey brick building	S-curve	Yes	12	/m2	C1	R 391.29	R 4 695.48	Height: 3m	No	12	/m2	C1	R 391.29	R 0.00	
731	Carport															
	Car ports (IBR roof)	S-curve	Yes	122	/m2	B7.2	R 49.21	R 6 003.62	Height: 2.5m	No	122	/m2	B7.2	R 49.21	R 0.00	
	Demolish concrete bases	S-curve	Yes	122	/m2	E6	R 59.75	R 7 289.50		No	122	/m2	E6	R 59.75	R 0.00	
732	Office															
	Removal of double storey brick building	S-curve	Yes	207	/m2	C2	R 704.33	R 145 796.31	Height: 8m	No	207	/m2	C2	R 704.33	R 0.00	
733	Changehouse															
	Removal of double storey brick building	S-curve	Yes	965	/m2	C2	R 704.33	R 679 678.45	Height: 5m	No	965	/m2	C2	R 704.33	R 0.00	
734	Emergency control room see 735															
	Removal of single storey brick building	S-curve	No	0	/m2	C1	R 391.29	R 0.00	Height: 4m	No	0	/m2	C1	R 391.29	R 0.00	
735	Office															
	Removal of single storey brick building	S-curve	Yes	2101	/m2	C1	R 391.29	R 822 100.29	Height: 4m	No	2101	/m2	C1	R 391.29	R 0.00	
736	Shed															
	Dismantling and removal of steel structures	S-curve	Yes	20	/m2	B3.1	R 75.04	R 1 500.80	Height: 2.5m	No	20	/m2	B3.1	R 75.04	R 0.00	
	Demolish concrete bases	S-curve	Yes	20	/m2	A2.6	R 122.28	R 2 445.60		No	20	/m2	A2.6	R 122.28	R 0.00	
737	Carport															
	Car ports (IBR roof)	S-curve	Yes	110	/m2	B7.2	R 49.21	R 5 413.10	Height: 2.5m	No	110	/m2	B7.2	R 49.21	R 0.00	
	Demolish concrete bases	S-curve	Yes	100	/m2	E6	R 59.75	R 5 975.00		No	100	/m2	E6	R 59.75	R 0.00	
738	Office see 735															
	Removal of single storey brick building	S-curve	No	0	/m2	C1	R 391.29	R 0.00	Height: 3m	No	0	/m2	C1	R 391.29	R 0.00	
739	Office see 735															
	Removal of single storey brick building	S-curve	No	0	/m2	C1	R 391.29	R 0.00	Height: 3m	No	0	/m2	C1	R 391.29	R 0.00	
740	Office															
	Removal of single storey brick building	S-curve	Yes	203	/m2	C1	R 391.29	R 79 431.87	Height: 3m	No	203	/m2	C1	R 391.29	R 0.00	
741	Office															
	Removal of single storey brick building	S-curve	Yes	758	/m2	C1	R 391.29	R 296 597.82	Height: 3m	No	758	/m2	C1	R 391.29	R 0.00	
742	Security office															
	Removal of single storey brick building	S-curve	Yes	75	/m2	C1	R 391.29	R 29 346.75	Height: 3m	No	75	/m2	C1	R 391.29	R 0.00	
743	Laundry															
	Removal of single storey brick building	S-curve	Yes	133	/m2	C1	R 391.29	R 52 041.57	Height: 3m	No	133	/m2	C1	R 391.29	R 0.00	
744	Office															
	Removal of double storey brick building	S-curve	Yes	942	/m2	C2	R 704.33	R 663 478.86	Height: 6m	No	942	/m2	C2	R 704.33	R 0.00	
745	Office															
	Removal of single storey brick building	S-curve	Yes	271	/m2	C1	R 391.29	R 106 039.59	Height: 3m	No	271	/m2	C1	R 391.29	R 0.00	
746	Office															
	Removal of single storey brick building	S-curve	Yes	326	/m2	C1	R 391.29	R 127 560.54	Height: 3m	No	326	/m2	C1	R 391.29	R 0.00	
747	Carport															
	Car ports (IBR roof)	S-curve	Yes	20	/m2	B7.2	R 49.21	R 984.20	Height: 3m	No	20	/m2	B7.2	R 49.21	R 0.00	
	Demolish concrete bases	S-curve	Yes	20	/m2	E6	R 59.75	R 1 195.00		No	20	/m2	E6	R 59.75	R 0.00	
748	Office															
	Removal of single storey brick building	S-curve	Yes	191	/m2	C1	R 391.29	R 74 736.39	Height: 4m	No	191	/m2	C1	R 391.29	R 0.00	
749	Lamproom see 691															
	Dismantling and removal of steel structures	S-curve	No	0	/m2	B3.1	R 75.04	R 0.00	Height: 7m	No	0	/m2	B3.1	R 75.04	R 0.00	
	Demolish concrete bases	S-curve	No	0	/m2	A2.6	R 122.28	R 0.00		No	0	/m2	A2.6	R 122.28	R 0.00	
750	Carport															
	Car ports (IBR roof)	S-curve	Yes	34	/m2	B7.2	R 49.21	R 1 673.14	Height: 3m	No	34	/m2	B7.2	R 49.21	R 0.00	
	Demolish concrete bases	S-curve	Yes	34	/m2	E6	R 59.75	R 2 031.50		No	34	/m2	E6	R 59.75	R 0.00	
751	Ablution															
	Removal of single storey brick building	S-curve	Yes	28	/m2	C1	R 391.29	R 10 956.12	Height: 4m	No	28	/m2	C1	R 391.29	R 0.00	
752	Carport															
	Car ports (IBR roof)	S-curve	Yes	77	/m2	B7.2	R 49.21	R 3 789.17	Height: 2.5m	No	77	/m2	B7.2	R 49.21	R 0.00	
	Demolish concrete bases	S-curve	Yes	77	/m2	A2.6	R 122.28	R 9 415.56		No	77	/m2	A2.6	R 122.28	R 0.00	
753	Carport															
	Car ports (IBR roof)	S-curve	Yes	3370	/m2	B7.2	R 49.21	R 165 837.70	Height: 2.5m	No	3370	/m2	B7.2	R 49.21	R 0.00	
	Demolish concrete bases	S-curve	Yes	3370	/m2	E6	R 59.75	R 201 357.50		No	3370	/m2	E6	R 59.75	R 0.00	
754	Guard house															
	Removal of single storey brick building	S-curve	Yes	22	/m2	C1	R 391.29	R 8 608.38	Height: 3m	No	22	/m2	C1	R 391.29	R 0.00	
755	Carport															
	Car ports (IBR roof)	S-curve	Yes	200	/m2	B7.2	R 49.21	R 9 842.00	Height: 2.5m	No	200	/m2	B7.2	R 49.21	R 0.00	
	Demolish concrete bases	S-curve	Yes	200	/m2	E6	R 59.75	R 11 950.00		No	200	/m2	E6	R 59.75	R 0.00	
756	Lecture room															
	Removal of single storey brick building	S-curve	Yes	168	/m2	C1	R 391.29	R 65 736.72	Height: 3m	No	168	/m2	C1	R 391.29	R 0.00	
757	Store															
	Removal of single storey brick building	S-curve	Yes	18	/m2	C1	R 391.29	R 7 043.22	Height: 3m	No	18	/m2	C1	R 391.29	R 0.00	
758	Training centre															
	Removal of temp/prefab buildings	S-curve	Yes	350	/m2	C5	R 97.82	R 34 237.00	Height: 3m	No	350	/m2	C5	R 97.82	R 0.00	
	Demolish concrete bases	S-curve	Yes	350	/m2	A2.6	R 122.28	R 42 798.00		No	350	/m2	A2.6	R 122.28	R 0.00	
759	Office															
	Removal of single storey brick building	S-curve	Yes	355	/m2	C1	R 391.29	R 138 907.95	Height: 4m	No	355	/m2	C1	R 391.29	R 0.00	
760	Carport															
	Car ports (IBR roof)	S-curve	Yes	30	/m2	B7.2	R 49.21	R 1 476.30	Height: 2.5m	No	30	/m2	B7.2	R 49.21	R 0.00	
	Demolish concrete bases	S-curve	Yes	30	/m2	E6	R 59.75	R 1 792.50		No	30	/m2	E6	R 59.75	R 0.00	
761	Carport															
	Car ports (IBR roof)	S-curve	Yes	30	/m2	B7.2	R 49.21	R 1 476.30	Height: 2.5m	No	30	/m2	B7.2	R 49.21	R 0.00	
	Demolish concrete bases	S-curve	Yes	30	/m2	E6	R 59.75	R 1 792.50		No	30	/m2	E6	R 59.75	R 0.00	
762	Guard house															
	Removal of single storey brick building	S-curve	Yes	6	/m2	C1	R 391.29	R 2 347.74	Height: 2.5m	No	6	/m2	C1	R 391.29	R 0.00	
763	Guard house															
	Removal of single storey brick building	S-curve	Yes	4	/m2	C1	R 391.29	R 1 565.16	Height: 2.5m	No	4	/m2	C1	R 391.29	R 0.00	
764	Store															
	Removal of single storey brick building	S-curve	Yes	56	/m2	C1	R 391.29	R 21 912.24	Height: 3m	No	56	/m2	C1	R 391.29	R 0.00	
765	Office															
	Removal of single storey brick building	S-curve	Yes	42	/m2	C1	R 391.29	R 16 434.18	Height: 3m	No	42	/m2	C1	R 391.29	R 0.00	
766	Carport															
	Car ports (IBR roof)	S-curve	Yes	35	/m2	B7.2	R 49.21	R 1 722.35	Height: 2.5m	No	35	/m2	B7.2	R 49.21	R 0.00	
	Demolish concrete bases	S-curve	Yes	35	/m2	E6	R 59.75	R 2 091.25		No	35	/m2	E6	R 59.75	R 0.00	
767	Office															
	Removal of single storey brick building	S-curve	Yes	500	/m2	C1	R 391.29	R 195 645.00	Height: 4m	No	500	/m2	C1	R 391.29	R 0.00	
768	Guard house															
	Removal of single storey brick building	S-curve	Yes	4	/m2	C1	R 391.29	R 1 565.16	Height: 2.5m	No	4	/m2	C1	R 391.29	R 0.00	
769	Store															
	Removal of single storey brick building	S-curve	Yes	20	/m2	C1	R 391.29	R 7 825.80	Height: 2.5m	No	20	/m2	C1	R 391.29	R 0.00	
	Transformer	S-curve	Yes	1	sum	N1	R 38 001.24	R 38 001.24		No	1	sum	N1	R 38 001.24	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
	Transformer	S-curve	Yes	1	sum	N1	R 38 001.24	R 38 001.24		No	1	sum	N1	R 38 001.24	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
	Transformer	S-curve	Yes	1	sum	N1	R 38 001.24	R 38 001.24		No	1	sum	N1	R 38 001.24	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
	Tanks x2	S-curve	Yes	2	/tank	B5.7	R 5 911.18	R 11 822.36		No	2	/tank	B5.7	R 5 911.18	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)

1896352 Sibanye Ezulwini Mine Closure Costs, as at December 2018																	
Ezulwini																	
Ref.		Closure Component	Cash flowed costs expensed method	Unscheduled Closure (2018)							Scheduled Closure (2027)						
				Applicable	Quantity	Unit	Unit rate code	Unit rate	Total cost	Notes	Applicable	Quantity	Unit	Unit rate code	Unit rate	Total cost	Notes
		Tank	S-curve	Yes	1	/tank	B5.7	R 5 911.18	R 5 911.18		No	1	/tank	B5.7	R 5 911.18	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
		Steel tank	S-curve	Yes	1	/tank	B5.7	R 5 911.18	R 5 911.18		No	1	/tank	B5.7	R 5 911.18	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
		Sub-total for Demolition of steel buildings and structures	#REF!						**R 15 436 207.66**							**R 629 619.22**	
	1.3	**Demolition of reinforced concrete buildings and structures**															
	1.3.1	**GOLD PLANT AREA**															
		Silo	S-curve	Yes	255	/m3	A1.3	R 770.54	R 196 487.70	Assume 20m high, 300mm thick, area measured on Google Earth	Yes	255	/m3	A1.3	R 770.54	R 196 487.70	Assume 20m high, 300mm thick, area measured on Google Earth
		Silo	S-curve	Yes	255	/m3	A1.3	R 770.54	R 196 487.70	Assume 20m high, 300mm thick, area measured on Google Earth	Yes	255	/m3	A1.3	R 770.54	R 196 487.70	Assume 20m high, 300mm thick, area measured on Google Earth
		Silo	S-curve	Yes	410	/m3	A1.3	R 770.54	R 315 921.40	Assume 20m high, 300mm thick, area measured on Google Earth	Yes	410	/m3	A1.3	R 770.54	R 315 921.40	Assume 20m high, 300mm thick, area measured on Google Earth
		Reservoir	S-curve	Yes	640	/m3	A1.3	R 770.54	R 493 145.60	Assumed 200mm thick , 4m deep	Yes	640	/m3	A1.3	R 770.54	R 493 145.60	Assumed 200mm thick , 4m deep
		Reservoir	S-curve	Yes	156	/m3	A1.3	R 770.54	R 120 204.24	Assumed 200mm thick, 2m deep	Yes	156	/m3	A1.3	R 770.54	R 120 204.24	Assumed 200mm thick, 2m deep
		Reservoir	S-curve	Yes	55	/m3	A1.3	R 770.54	R 42 379.70	Assumed 200mm thick, 2m deep	Yes	55	/m3	A1.3	R 770.54	R 42 379.70	Assumed 200mm thick, 2m deep
		Paddock	S-curve	Yes	40	/m3	A1.4	R 489.12	R 19 564.80		Yes	40	/m3	A1.4	R 489.12	R 19 564.80	
		Concrete remnants at Old rubble salvage yard, training centre and stores	S-curve	Yes	2805	/m3	A1.4	R 489.12	R 1 371 981.60	Assume 10% ground cover of 18.7 ha and 15% of structures remaining	Yes	2805	/m3	A1.4	R 489.12	R 1 371 981.60	Assume 10% ground cover of 18.7 ha and 15% of structures remaining
	1.3.2	**SHAFT AND HOSTEL AREA**	S-curve														
		Water Tank	S-curve	Yes	402	/m3	A1.3	R 770.54	R 309 757.08	Assume 2m deep, 300mm thick, area measured on Google Earth	No	402	/m3	A1.3	R 770.54	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
		Water Tank	S-curve	Yes	402	/m3	A1.3	R 770.54	R 309 757.08	Assume 2m deep, 300mm thick, area measured on Google Earth	No	402	/m3	A1.3	R 770.54	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
		Water Tank	S-curve	Yes	402	/m3	A1.3	R 770.54	R 309 757.08	Assume 2m deep, 300mm thick, area measured on Google Earth	No	402	/m3	A1.3	R 770.54	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
		Water Tank	S-curve	Yes	402	/m3	A1.3	R 770.54	R 309 757.08	Assume 2m deep, 300mm thick, area measured on Google Earth	No	402	/m3	A1.3	R 770.54	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
		Heli Pad	S-curve	No	0	/m3	A1.3	R 770.54	R 0.00	Demarcated on road, no provision need be made	No	0	/m3	A1.3	R 770.54	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
		Sub-total for Demolition of reinforced concrete buildings and structures	S-curve						**R 3 995 201.06**							**R 2 756 172.74**	
	1.4	**Rehabilitation of access roads and haul roads**															
	1.4.1	Access Roads	S-curve	Yes	4000	/m2	E1	R 62.81	R 251 240.00	Assume 75mm thick asphalt. Demolish and crush asphalt and dispose at Crushed asphalt temporary storage area at Cooke operations.	Yes	4000	/m2	E1	R 62.81	R 251 240.00	Assume 75mm thick asphalt. Demolish and crush asphalt and dispose at Crushed asphalt temporary storage area at Cooke operations.
		Sub-total for Rehabilitation of access roads and haul roads	0.00						**R 251 240.00**							**R 251 240.00**	
	1.5	**Demolition of offices, workshops and residential buildings**															
	1.5.1	**GOLD PLANT AREA**								Covered elsewhere/duplication with 2018 infrastructure inventory removed							Covered elsewhere/duplication with 2018 infrastructure inventory removed
	1.5.2	**SHAFT AND HOSTEL AREA**															
526		Garages															
		Removal of single storey brick building	S-curve	No	40	/m2	C1	R 391.29	R 0.00	Height: 3m	No	40	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
527		Substation															
		Removal of single storey brick building	S-curve	No	34	/m2	C1	R 391.29	R 0.00	Height: 3m	No	34	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
528		Garages															
		Removal of double storey brick building	S-curve	No	112	/m2	C2	R 704.33	R 0.00	Height: 5m	No	112	/m2	C2	R 704.33	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
529		Farmhouse															
		Removal of double storey brick building	S-curve	No	212	/m2	C2	R 704.33	R 0.00	Height: 10m	No	212	/m2	C2	R 704.33	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
530		Lapa															
		Removal of single storey brick building	S-curve	No	35	/m2	C1	R 391.29	R 0.00	Height: 3m	No	35	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
531		Staff quarters (derelict)															
		Removal of single storey brick building	S-curve	Yes	10	/m2	C1	R 391.29	R 3 912.90	Height: 2.5m	No	10	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
532		Staff quartrers															
		Removal of single storey brick building	S-curve	No	53	/m2	C1	R 391.29	R 0.00	Height: 3m	No	53	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
533		Staff quarters															
		Removal of single storey brick building	S-curve	No	41	/m2	C1	R 391.29	R 0.00	Height: 3m	No	41	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
534		Guard house															
		Removal of single storey brick building	S-curve	No	13	/m2	C1	R 391.29	R 0.00	Height: 3m	No	13	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
535		House															
		Removal of double storey brick building	S-curve	No	280	/m2	C2	R 704.33	R 0.00	Height: 5m	No	280	/m2	C2	R 704.33	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
536		Carport															
		Car ports (IBR roof)	S-curve	No	46	/m2	B7.2	R 49.21	R 0.00	Height: 2.5m	No	46	/m2	B7.2	R 49.21	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
		Demolish concrete bases	S-curve	No	46	/m2	A2.6	R 122.28	R 0.00		No	46	/m2	A2.6	R 122.28	R 0.00	
537		House															
		Removal of double storey brick building	S-curve	No	125	/m2	C2	R 704.33	R 0.00	Height: 5m	No	125	/m2	C2	R 704.33	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
538		Outbuilding															
		Removal of single storey brick building	S-curve	No	78	/m2	C1	R 391.29	R 0.00	Height: 4m	No	78	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
539		House															
		Removal of single storey brick building	S-curve	No	292	/m2	C1	R 391.29	R 0.00	Height: 4m	No	292	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
540		Ruin 1															
		Removal of single storey brick building	S-curve	Yes	674	/m2	C1	R 391.29	R 263 729.46	Height: 3m	No	674	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
541		Ruin 2															
		Removal of single storey brick building	S-curve	Yes	61	/m2	C1	R 391.29	R 23 868.69	Height: 3m	No	61	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
542		Ruin 3															
		Removal of single storey brick building	S-curve	Yes	35	/m2	C1	R 391.29	R 13 695.15	Height: 4m	No	35	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
543		Ruin 4															
		Removal of double storey brick building	S-curve	Yes	299	/m2	C2	R 704.33	R 210 594.67	Height: 5m	No	299	/m2	C2	R 704.33	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
544		Shed															
		Dismantling and removal of steel structures	S-curve	No	308	/m2	B3.1	R 75.04	R 0.00	Height: 2.5m	No	308	/m2	B3.1	R 75.04	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
		Demolish concrete bases	S-curve	No	308	/m2	A2.6	R 122.28	R 0.00		No	308	/m2	A2.6	R 122.28	R 0.00	
545		Ruin 5															
		Removal of single storey brick building	S-curve	Yes	27	/m2	C1	R 391.29	R 10 564.83	Height: 3m	No	27	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
546		House															
		Removal of double storey brick building	S-curve	No	394	/m2	C2	R 704.33	R 0.00	Height: 5m	No	394	/m2	C2	R 704.33	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
770		Hostel building 1								Height: 3m							
		Removal of single storey brick building	S-curve	Yes	350	/m2	C1	R 391.29	R 136 951.50		No	350	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
771		Hostel security								Height: 2.5m							
		Removal of single storey brick building	S-curve	Yes	67	/m2	C1	R 391.29	R 26 216.43		No	67	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
772		Hostel building 2								Height: 3m							
		Removal of single storey brick building	S-curve	Yes	120	/m2	C1	R 391.29	R 46 954.80		No	120	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
773		Hostel building 3								Height: 6m							
		Removal of double storey brick building	S-curve	Yes	1730	/m2	C2	R 704.33	R 1 218 490.90		No	1730	/m2	C2	R 704.33	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
774		Hostel building 4								Height: 3m							
		Removal of single storey brick building	S-curve	Yes	254	/m2	C1	R 391.29	R 99 387.66		No	254	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
775		Hostel building 5								Height: 5m							
		Removal of double storey brick building	S-curve	Yes	371	/m2	C2	R 704.33	R 261 306.43		No	371	/m2	C2	R 704.33	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
776		Hostel building 6								Height: 4m							
		Removal of single storey brick building	S-curve	Yes	480	/m2	C1	R 391.29	R 187 819.20		No	480	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
777		Hostel building 7								Height: 2.5m							
		Removal of single storey brick building	S-curve	Yes	96	/m2	C1	R 391.29	R 37 563.84		No	96	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
778		Substation								Height: 3m							
		Removal of single storey brick building	S-curve	Yes	81	/m2	C1	R 391.29	R 31 694.49		No	81	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
779		Hostel building 8								Height: 3m							
		Removal of single storey brick building	S-curve	Yes	732	/m2	C1	R 391.29	R 286 424.28		No	732	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
780		Hostel building 9								Height: 2.5m							
		Removal of single storey brick building	S-curve	Yes	59	/m2	C1	R 391.29	R 23 086.11		No	59	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
781		Hostel ruins								Height: 3m							
		Removal of single storey brick building	S-curve	Yes	914	/m2	C1	R 391.29	R 357 639.06		No	914	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
782		Ablution								Height: 3m							
		Removal of single storey brick building	S-curve	Yes	35	/m2	C1	R 391.29	R 13 695.15		No	35	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
783		Accommodation								Height: 3m							
		Removal of single storey brick building	S-curve	Yes	980	/m2	C1	R 391.29	R 383 464.20		No	980	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
784		Supply store								Height: 7m							
Could possibly take out if village remains		Removal of double storey brick building	S-curve	No	2210	/m2	C2	R 704.33	R 0.00		No	2210	/m2	C2	R 704.33	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
785		Supply store ruins								Height: 6m							
		Removal of double storey brick building	S-curve	Yes	291	/m2	C2	R 704.33	R 204 960.03		No	291	/m2	C2	R 704.33	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
786		School building 1								Height: 4m							
		Removal of single storey brick building	S-curve	No	36	/m2	C1	R 391.29	R 0.00		No	36	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
787		School building 2								Height: 3m							
		Removal of single storey brick building	S-curve	No	240	/m2	C1	R 391.29	R 0.00		No	240	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
788		School building 3								Height: 4m							
		Removal of single storey brick building	S-curve	No	55	/m2	C1	R 391.29	R 0.00		No	55	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
789		School building 4								Height: 3m							
		Removal of single storey brick building	S-curve	No	128	/m2	C1	R 391.29	R 0.00		No	128	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
790		School building 5								Height: 4m							
		Removal of single storey brick building	S-curve	No	82	/m2	C1	R 391.29	R 0.00		No	82	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
791		Carport								Height: 3m							
		Car ports (IBR roof)	S-curve	No	170	/m2	B7.2	R 49.21	R 0.00		No	170	/m2	B7.2	R 49.21	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
		Demolish concrete bases	S-curve	No	170	/m2	A2.6	R 122.28	R 0.00		No	170	/m2	A2.6	R 122.28	R 0.00	
792		School building 6								Height: 3m							
		Removal of single storey brick building	S-curve	No	360	/m2	C1	R 391.29	R 0.00		No	360	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
793		School building 7								Height: 3m							
		Removal of single storey brick building	S-curve	No	205	/m2	C1	R 391.29	R 0.00		No	205	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
794		School building 8								Height: 3m							
		Removal of single storey brick building	S-curve	No	117	/m2	C1	R 391.29	R 0.00		No	117	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
795		Carport								Height: 2.5m							
		Car ports (IBR roof)	S-curve	No	92	/m2	B7.2	R 49.21	R 0.00		No	92	/m2	B7.2	R 49.21	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
		Demolish concrete bases	S-curve	No	92	/m2	A2.6	R 122.28	R 0.00		No	92	/m2	A2.6	R 122.28	R 0.00	
796		School building 9								Height: 6m							
		Removal of double storey brick building	S-curve	No	264	/m2	C2	R 704.33	R 0.00		No	264	/m2	C2	R 704.33	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
797		School building 10								Height: 3m							
		Removal of temp/prefab building	S-curve	No	174	/m2	C5	R 97.82	R 0.00		No	174	/m2	C5	R 97.82	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
		Demolish concrete bases	S-curve	No	174	/m2	A2.6	R 122.28	R 0.00		No	174	/m2	A2.6	R 122.28	R 0.00	
798		School building 11								Height: 3m							
		Removal of single storey brick building	S-curve	No	90	/m2	C1	R 391.29	R 0.00		No	90	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
799		School building 12								Height: 3m							

1896352 Sibanye Ezulwini Mine Closure Costs, as at December 2018																		
Ezulwini																		
Ref.		Closure Component (Select)	Cash flowed costs expensed method	Unscheduled Closure (2018)							Scheduled Closure (2027)						
				Applicable	Quantity	Unit	Unit rate code	Unit rate	Total cost	Notes	Applicable	Quantity	Unit	Unit rate code	Unit rate	Total cost	Notes
		Removal of temp/prefab building	S-curve	No	120	/m2	C5	R 97.82	R 0.00		No	120	/m2	C5	R 97.82	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
		Demolish concrete bases	S-curve	No	120	/m2	A2.6	R 122.28	R 0.00		No	120	/m2	A2.6	R 122.28	R 0.00	
800		School building 13								Height: 3m							
		Removal of single storey brick building	S-curve	No	84	/m2	C1	R 391.29	R 0.00		No	84	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
801		School building 14								Height: 3m							
		Removal of temp/prefab building	S-curve	No	116	/m2	C5	R 97.82	R 0.00		No	116	/m2	C5	R 97.82	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
		Demolish concrete bases	S-curve	No	116	/m2	A2.6	R 122.28	R 0.00		No	116	/m2	A2.6	R 122.28	R 0.00	
802		Village house type 1								Height: 3m							
		Removal of single storey brick building	S-curve	No	2052	/m2	C1	R 391.29	R 0.00		No	2052	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
802		Village house type 1								Height: 3m							
		Removal of single storey brick building	S-curve	No	2619	/m2	C1	R 391.29	R 0.00		No	2619	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
803		Village house type 2								Height: 3m							
		Removal of single storey brick building	S-curve	No	280	/m2	C1	R 391.29	R 0.00		No	280	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
803		Village house type 2								Height: 3m							
		Removal of single storey brick building	S-curve	No	2356	/m2	C1	R 391.29	R 0.00		No	2356	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
804		Guard house								Height: 3m							
		Removal of single storey brick building	S-curve	Yes	28	/m2	C1	R 391.29	R 10 956.12		No	28	/m2	C1	R 391.29	R 0.00	Assume demolished by scheduled closure as shaft has been decommissioned (2017)
805		Sewage plant building 1								Height: 2.5m							
		Removal of single storey brick building	S-curve	No	16	/m2	C1	R 391.29	R 0.00	Belongs to Morgan Creek as communicated by Sibanye (2018)	No	16	/m2	C1	R 391.29	R 0.00	Belongs to Morgan Creek as communicated by Sibanye (2018)
806		Pump house								Height: 2.5m							
		Dismantling and removal of steel structures	S-curve	No	16	/m2	B3.1	R 75.04	R 0.00	Belongs to Morgan Creek	No	16	/m2	B3.1	R 75.04	R 0.00	Belongs to Morgan Creek
		Demolish concrete bases	S-curve	No	16	/m2	A2.6	R 122.28	R 0.00		No	16	/m2	A2.6	R 122.28	R 0.00	
807		Pump house								Height: 3m							
		Removal of single storey brick building	S-curve	No	18	/m2	C1	R 391.29	R 0.00	Belongs to Morgan Creek	No	18	/m2	C1	R 391.29	R 0.00	Belongs to Morgan Creek
808		Sewage plant building 2								Height: 3m							
		Removal of single storey brick building	S-curve	No	16	/m2	C1	R 391.29	R 0.00	Belongs to Morgan Creek	No	16	/m2	C1	R 391.29	R 0.00	Belongs to Morgan Creek
809		Sewage plant building 3								Height: 2.5m							
		Removal of single storey brick building	S-curve	No	25	/m2	C1	R 391.29	R 0.00	Belongs to Morgan Creek	No	25	/m2	C1	R 391.29	R 0.00	Belongs to Morgan Creek
810		Sewage plant building 4								Height: 2.5m							
		Removal of single storey brick building	S-curve	No	20	/m2	C1	R 391.29	R 0.00	Belongs to Morgan Creek	No	20	/m2	C1	R 391.29	R 0.00	Belongs to Morgan Creek
811		Sewage plant building 5								Height: 3m							
		Removal of single storey brick building	S-curve	No	16	/m2	C1	R 391.29	R 0.00	Belongs to Morgan Creek	No	16	/m2	C1	R 391.29	R 0.00	Belongs to Morgan Creek
812		Sewage plant building 6								Height: 2.5m							
		Removal of single storey brick building	S-curve	No	96	/m2	C1	R 391.29	R 0.00	Belongs to Morgan Creek	No	96	/m2	C1	R 391.29	R 0.00	Belongs to Morgan Creek
813		Sewage plant building 7								Height: 2.5m							
		Removal of single storey brick building	S-curve	No	8	/m2	C1	R 391.29	R 0.00	Belongs to Morgan Creek	No	8	/m2	C1	R 391.29	R 0.00	Belongs to Morgan Creek
814		Sewage plant building 8								Height: 3m							
		Removal of single storey brick building	S-curve	No	55	/m2	C1	R 391.29	R 0.00	Belongs to Morgan Creek	No	55	/m2	C1	R 391.29	R 0.00	Belongs to Morgan Creek
815		Sewage plant building 9								Height: 3m							
		Removal of single storey brick building	S-curve	No	52	/m2	C1	R 391.29	R 0.00	Belongs to Morgan Creek	No	52	/m2	C1	R 391.29	R 0.00	Belongs to Morgan Creek
816		Sewage plant building 10								Height: 3m							
		Removal of single storey brick building	S-curve	No	55	/m2	C1	R 391.29	R 0.00	Belongs to Morgan Creek	No	55	/m2	C1	R 391.29	R 0.00	Belongs to Morgan Creek
849		Weighbridge								Height: 5m							Height: 5m
		Removal of double storey brick building	S-curve	Yes	14	/m2	C2	R 704.33	R 9 860.62		Yes	14	/m2	C2	R 704.33	R 9 860.62	
850		Substation								Height: 4m							Height: 4m
		Removal of single storey brick building	S-curve	Yes	90	/m2	C1	R 391.29	R 35 216.10		Yes	90	/m2	C1	R 391.29	R 35 216.10	
851		Pump house								Height: 3m							Height: 3m
		Removal of single storey brick building	S-curve	Yes	50	/m2	C1	R 391.29	R 19 564.50		Yes	50	/m2	C1	R 391.29	R 19 564.50	
852		Shed								Height: 2.5m							Height: 2.5m
		Dismantling and removal of steel structures	S-curve	Yes	50	/m2	B3.1	R 75.04	R 3 752.00		Yes	50	/m2	B3.1	R 75.04	R 3 752.00	
		Demolish concrete bases	S-curve	No	50	/m2	A2.6	R 122.28	R 0.00		Yes	50	/m2	A2.6	R 122.28	R 6 114.00	
853		Club house								Height: 4m							Height: 4m
		Removal of single storey brick building	S-curve	No	634	/m2	C1	R 391.29	R 0.00		Yes	634	/m2	C1	R 391.29	R 248 077.86	
854		Store (derelict)								Height: 2.5m							Height: 2.5m
		Removal of single storey brick building	S-curve	Yes	25	/m2	C1	R 391.29	R 9 782.25		Yes	25	/m2	C1	R 391.29	R 9 782.25	
855		Squash courts (derelict)								Height: 5m							Height: 5m
		Removal of single storey brick building	S-curve	Yes	183	/m2	C1	R 391.29	R 71 606.07		Yes	183	/m2	C1	R 391.29	R 71 606.07	
856		Caddy shack								Height: 2m							Height: 2m
		Removal of single storey brick building	S-curve	No	20	/m2	C1	R 391.29	R 0.00		Yes	20	/m2	C1	R 391.29	R 7 825.80	
857		Workshop								Height: 3m							Height: 3m
		Removal of single storey brick building	S-curve	No	96	/m2	C1	R 391.29	R 0.00		Yes	96	/m2	C1	R 391.29	R 37 563.84	
858		Staff quarters								Height: 2.5m							Height: 2.5m
		Removal of single storey brick building	S-curve	No	70	/m2	C1	R 391.29	R 0.00		Yes	70	/m2	C1	R 391.29	R 27 390.30	
859		Staff quarters								Height: 4m							Height: 4m
		Removal of single storey brick building	S-curve	No	45	/m2	C1	R 391.29	R 0.00		Yes	45	/m2	C1	R 391.29	R 17 608.05	
860		Residential houses								Height: 4m							Height: 4m
		Removal of single storey brick building	S-curve	No	5760	/m2	C1	R 391.29	R 0.00		Yes	5760	/m2	C1	R 391.29	R 2 253 830.40	
860		Residential houses								Height: 4m							Height: 4m
		Removal of single storey brick building	S-curve	No	4692	/m2	C1	R 391.29	R 0.00		Yes	4692	/m2	C1	R 391.29	R 1 835 932.68	
860		Residential houses								Height: 4m							Height: 4m
		Removal of single storey brick building	S-curve	No	7224	/m2	C1	R 391.29	R 0.00		Yes	7224	/m2	C1	R 391.29	R 2 826 678.96	
		Sub-total for Demolition of offices, workshops and residential buildings	#REF!						**R 4 002 757.44**							**R 7 410 803.43**	
	1.6	**Demolition and rehabilitation of electrified railway lines**															
		Not applicable	S-curve	No	0	N/A	L1	R 0.00	R 0.00		No	0	N/A	L1	R 0.00	R 0.00	
		Sub-total for Demolition and rehabilitation of electrified railway lines							**R 0.00**							**R 0.00**	
	1.7	**Demolition and rehabilitation of non-electrified railway lines**															
		Not applicable	S-curve	No	0	N/A	L1	R 0.00	R 0.00		No	0	N/A	L1	R 0.00	R 0.00	
		Sub-total for Demolition and rehabilitation of non-electrified railway lines	0.00						**R 0.00**							**R 0.00**	
	1.8	**Other linear Infrastructure**															
	1.8.1	**Pipelines**															
		HDPE pipelines in plant area	S-curve	Yes	1000	/m	D3.7	R 26.49	R 26 490.00	Assume an average HDPE pipe length of 1 000m around plant area	Yes	1000	/m	D3.7	R 26.49	R 26 490.00	Assume an average HDPE pipe length of 1 000m around plant area
		New HDPE Return pipe (2015)	S-curve	Yes	340	/m	D3.7	R 26.49	R 9 006.60	Pipe dia. 150mm, with a total length of 340m.	Yes	340	/m	D3.7	R 26.49	R 9 006.60	Pipe dia. 150mm, with a total length of 340m.
		New HDPE Feed pipe (2015)	S-curve	Yes	340	/m	D3.7	R 26.49	R 9 006.60	Pipe dia. 200mm, with a total length of 340m.	Yes	340	/m	D3.7	R 26.49	R 9 006.60	Pipe dia. 200mm, with a total length of 340m.
	1.8.2	**Fencing**															
		Removal of security fencing	S-curve	Yes	5000	/m	I2.1	R 42.40	R 212 000.00		Yes	5000	/m	I2.1	R 42.40	R 212 000.00	
		Sub-total for Other linear Infrastructure	S-curve						**R 256 503.20**							**R 256 503.20**	
	1.9	**Demolition waste**															
	1.9.1	Steel equipment and scrap steel															
		Construction of a decontamination bay	S-curve	Yes	1	sum	N2	R 567 628.64	R 567 628.64	Nominal allowance	Yes	1	sum	N2	R 567 628.64	R 567 628.64	Assume 1000 m² in-situ concrete surface of 150 mm thick, at R 2 660/m³ plus 25% for sumps, etc. 10% added to the original rate of R2600 for escalation
		Decontamination of steel equipment	S-curve	Yes	1	/sum	L2	R 349 604.68	R 349 604.68	3 percent of total demolition cost of steel components. The percentages for decontamination of demolition waste was obtained from demolition contractors, as estimated for an operation of this size and nature.	Yes	1	/sum	L2	R 186 764.00	R 186 764.00	3 percent of total demolition cost of steel components. The percentages for decontamination of demolition waste was obtained from demolition contractors, as estimated for an operation of this size and nature.
		Establishment of a salvaging yard	S-curve	Yes	1	sum	N3	R 220 394.10	R 220 394.10	Nominal allowance	Yes	1	sum	N3	R 220 394.10	R 220 394.10	Assume 5000 m² salvage yard of 50m x 100m, with imported aggregate surface 150 mm at R 1 70/m³ including in-situ material compaction , plus 300m security fencing @ R 151/m
	1.9.2	Concrete demolition waste															
		Decontamination of concrete	S-curve	Yes	1	/sum	L2	R 346 574.81	R 346 574.81	5 percent of total demolition cost of concrete components. The percentages for decontamination of demolition waste was obtained from demolition contractors, as estimated for an operation of this size and nature.	Yes	1	/sum	L2	R 179 459.14	R 179 459.14	5 percent of total demolition cost of concrete components. The percentages for decontamination of demolition waste was obtained from demolition contractors, as estimated for an operation of this size and nature.
		Crushing of concrete	S-curve	Yes	10213	/m3	A3.1	R 206.43	R 2 108 176.70	Assume 15km transport distance	Yes	5803	/m3	A3.1	R 206.43	R 1 197 985.54	
		Transport of waste to waste site	S-curve	Yes	10213	/m3	M7	R 126.79	R 1 294 849.21	Assume 15km transport distance	Yes	5803	/m3	M7	R 126.79	R 735 806.75	Assume 15km transport distance
	1.9.3	General demolition waste															
		Sorting and screening of demolition waste	S-curve	Yes	1	/sum	L2	R 1 073 440.60	R 1 073 440.60	3 percent of total demolition cost. The percentage for sorting and screening of demolition waste was obtained from demolition contractors, as estimated for an operation of this size and nature.	Yes	1	/sum	L2	R 620 359.67	R 620 359.67	3 percent of total demolition cost. The percentage for sorting and screening of demolition waste was obtained from demolition contractors, as estimated for an operation of this size and nature.
		Transport of waste to dedicated demolition waste disposal site	S-curve	Yes	7992.30	/m3	M7	R 126.79	R 1 013 343.72	Assume 15km haul distance.	Yes	7191.3	/m3	M7	R 126.79	R 911 784.93	Assume 15km haul distance.
	1.9.4	Hazardous waste															
		Transport hazardous waste to Holfontein	S-curve	Yes	100	/m3	M10	R 889.40	R 88 940.00	Nominal allowance of 100m3. Transport and disposal at 130km distance. A detailed inventory of waste volumes requiring disposal was not available for the purposes of the costing and hence a conservative sum allowance was made.	Yes	100	/m3	M10	R 889.40	R 88 940.00	Nominal allowance of 100m3. Transport and disposal at 130km distance. A detailed inventory of waste volumes requiring disposal was not available for the purposes of the costing and hence a conservative sum allowance was made.
	1.9.5	Cyanide- related decontamination of gold plant	S-curve	Yes	1	/sum	L2	R 617 359.36	R 617 359.36	Provisional amount, assume 5% of total plant infrastructural cost excluding disposal of demolition waste	Yes	1	/sum	L2	R 494 103.02	R 494 103.02	Provisional amount, assume 5% of total plant infrastructural cost excluding disposal of demolition waste
		Sub-total for Demolition waste	S-curve						**R 7 680 311.83**							**R 5 203 225.78**	
		Sub-total for Infrastructural Areas							**R 43 969 408.46**							**R 26 389 624.74**	
	2	**Mining Areas**															
	2.1	**Open pit rehabilitation including final voids and ramps**															
		Not applicable	S-curve	No	0	N/A	L1	R 0.00	R 0.00		No	0	N/A	L1	R 0.00	R 0.00	
		Sub-total for Open pit rehabilitation including final voids and ramps	0.00						**R 0.00**							**R 0.00**	
	2.2	**Sealing of shafts, adits and inclines**															
	2.2.1	**SHAFT AND HOSTEL AREA**															
		Seal ventilation shaft	S-curve	Yes	1	sum	F1.4	R 2 564 232.00	R 2 564 232.00	Assume diameter 5m	Yes	1	sum	F1.4	R 2 564 232.00	R 2 564 232.00	Assume diameter 5m
		Seal vertical shaft	S-curve	Yes	1	sum	F1.6	R 3 655 620.00	R 3 655 620.00	Assume diameter 7m	Yes	1	sum	F1.6	R 3 655 620.00	R 3 655 620.00	Assume diameter 7m
		Sub-total for Sealing of shafts, adits and inclines	S-curve						**R 6 219 852.00**							**R 6 219 852.00**	
	2.3	**Rehabilitation of stockpiles and processing residues**															
		Not applicable	S-curve	No	0	N/A	L1	R 0.00	R 0.00		No	0	N/A	L1	R 0.00	R 0.00	
		Sub-total for Rehabilitation of stockpiles and processing residues	0.00						**R 0.00**							**R 0.00**	
	2.4	**Rehabilitation of clean water impoundments**															
		Not applicable	S-curve	No	0	N/A	L1	R 0.00	R 0.00		No	0	N/A	L1	R 0.00	R 0.00	
		Sub-total for Rehabilitation of clean water impoundments	0.00						**R 0.00**							**R 0.00**	
	2.5	**Rehabilitation of dirty water impoundments**															
	2.5.1	**Tailings Dam**								Note - Only Cooke 4 Active, dormant is included under RUSO							
	2.5.1.1 A	**UNSCHEDULED CLOSURE - STANDARD 500MM SOIL COVER (applied as per 2017 closure cost assessment)**															
		Spillway for upper surface routing	S-curve	Yes	720	/m²	N8	R 408.00	R 293 760.00	Spillway and penstock required during care and maintenance to prevent flooding	No	0	/sum	L2	R 0.00	R 0.00	Not Applicable to scheduled closure
		Dismantling and closing of penstock	S-curve	Yes	1	sum	F2.3	R 79 470.00	R 79 470.00		No	0	/sum	L2	R 0.00	R 0.00	Not Applicable to scheduled closure
		Shaping/slope modification of northern and western outer slopes	S-curve	Yes	204398	/m3	H4.4	R 9.87	R 2 017 411.76	Slope of walls at 28 deg; assume average height is 23m. Shape walls to 18 deg (1:3). A slope factor of 79.1m3/m and the TSF Perimeter = 4494m measured on Google earth.. Half of TSF perimeter used to represent N + W slopes	No	0	/sum	L2	R 0.00	R 0.00	Not Applicable to scheduled closure
		Apply lime breaker layer	S-curve	Yes	99	/ha	G2.11	R 10 384.08	R 1 032 177.55	Assume 35t/ha	No	0	/sum	L2	R 0.00	R 0.00	Not Applicable to scheduled closure
		Soil cover to N + W slopes and upper surface	S-curve	Yes	397600	/m3	H2.1.1	R 33.95	R 13 498 520.00	Assumed 400mm thickness. N + W slope area plus 15% (assumed increase in total area due to reprofiling) as well as beach used, to prevent percollation	No	0	/sum	L2	R 0.00	R 0.00	Not Applicable to scheduled closure
		Vegetation of cover	S-curve	Yes	99	/ha	G2.1	R 33 820.08	R 3 361 715.95	N + W area plus 15% (assumed increase in total area due to reprofiling) and beach used.	No	0	/sum	L2	R 0.00	R 0.00	Not Applicable to scheduled closure
		General storm water routing along upper surface	S-curve	Yes	81	/ha	N24	R 2 945.47	R 238 583.07	Total beach area	No	0	/sum	L2	R 0.00	R 0.00	Not Applicable to scheduled closure
		General storm water routing along N + W slopes	S-curve	Yes	18.4	/ha	N24	R 2 945.47	R 54 196.65	N + W slopes plus 15% (assumed increase in total area due to reprofiling) used.	No	0	/sum	L2	R 0.00	R 0.00	Not Applicable to scheduled closure
		General storm water routing along toe	S-curve	Yes	5168.1	/m	G3.2	R 286.09	R 1 478 541.73	Measured perimeter plus 15% (assumed increase in perimeter due to reprofiling) used.	No	0	/sum	L2	R 0.00	R 0.00	Not Applicable to scheduled closure
		Vegetation establishment on TSF beach	S-curve	No	81	/ha	N29	R 105 460.85	R 0.00	Not applicable - top vegetation to be established on soil cover and not directly on tailings, to prevent percollation	No	0	N/A	L1	R 0.00	R 0.00	Not Applicable to scheduled closure

1896352 Sibanye Ezulwini Mine Closure Costs, as at December 2018

Ezulwini

Ref.		Closure Component (Select)	Cash flowed costs expensed method	Unscheduled Closure (2018)							Scheduled Closure (2027)						
				Applicable	Quantity	Unit	Unit rate code	Unit rate	Total cost	Notes	Applicable	Quantity	Unit	Unit rate code	Unit rate	Total cost	Notes
		Slope preparation of TSF side slopes	S-curve	Yes	16	/ha	N30	R 9 873.00	R 157 968.00	Half of side slope area used, to represent S + E slopes	No	0	N/A	L1	R 0.00	R 0.00	Not Applicable to scheduled closure
		Vegetation establishment directly on TSF side slopes	S-curve	Yes	16	/ha	N31	R 283 131.84	R 4 530 109.44	Half of side slope area used, to represent S + E slopes	No	0	N/A	L1	R 0.00	R 0.00	Not Applicable to scheduled closure
		Installation of leaching equipment	S-curve	Yes	16	/ha	N32	R 50 047.06	R 800 752.96	Half of side slope area used, to represent S + E slopes	No	0	N/A	L1	R 0.00	R 0.00	Not Applicable to scheduled closure
33496495.13		Leaching of side slopes and beach for 18 months	S-curve	Yes	268704	KL	N33	R 12.50	R 3 358 800.00	933 KL/month x 18 months = 16794 kilo liters per Hectare	No	0	N/A	L1	R 0.00	R 0.00	Not Applicable to scheduled closure
	2.5.1.1 B	**UNSCHEDULED CLOSURE OPTION 2 - HOLDING PATTERN (NOT used for 2015 and 2016 closure cost assessment)**	S-curve														
		Spillway for upper surface routing	S-curve	No	720	/m²	N8	R 408.00	R 0.00	Spillway and penstock required during care and maintenance to prevent flooding	No	0	N/A	L1	R 0.00	R 0.00	Not Applicable to scheduled closure
		Dismantling and closing of penstock	S-curve	No	1	sum	F2.3	R 79 470.00	R 0.00		No	0	N/A	L1	R 0.00	R 0.00	Not Applicable to scheduled closure
		Erect signage and painted drums indicating cyanide hazard	S-curve	No	1	sum	N10	R 65 131.54	R 0.00	No fences to be erected as this will be stolen	No	0	N/A	L1	R 0.00	R 0.00	Not Applicable to scheduled closure
		Ridge plowing and cross walls to curb dust impacts	S-curve	No	85	/ha	N11	R 95 091.98	R 0.00	Total beach area used	No	0	N/A	L1	R 0.00	R 0.00	Not Applicable to scheduled closure
		Shaping/slope modification of outer slopes	S-curve	No	355475.4	/m3	H4.4	R 9.87	R 0.00	Not applicable	No	0	N/A	L1	R 0.00	R 0.00	Not Applicable to scheduled closure
		Vegetation of dump directly onto tailings	S-curve	No	134	/ha	G2.2	R 43 671.39	R 0.00	Assume ridge-ploughing measures employed on beach would be sufficient to prevent excessive wind-blown dust. Side slopes are expected to remain stable enough in current configuration for the duration of the holding pattern, toe paddocks will be cleaned out to ensure washed down tailings sediment is intercepted.	No	0	N/A	L1	R 0.00	R 0.00	Not Applicable to scheduled closure
		General repairs of toe paddocks	S-curve	No	11.64375	/ha	G1.1	R 77 152.13	R 0.00	Toe paddocks = 15.5 ha. Allowance was made to excavate and repair 75% of the toe paddock area, 25% of the toe paddocks consist of the embankments and therefore are not included.	No	0	N/A	L1	R 0.00	R 0.00	Not Applicable to scheduled closure
	2.5.1.2	**SCHEDULED CLOSURE - FOOTPRINT CLEANUP FOLLOWING TSF REPROCESSING**															
		Making good of TSF footprint after re-processing and prior to final shaping and rehabilitation								Not applicable to unscheduled closure							According to the Sibanye Mineral reserve this tailings facility will be reprossessed during operations.
		Excavate 250mm material on footrpint (To remove the possiblity of radioactive material)	S-curve	No	0	/m3	H1.1	R 35.37	R 0.00	Not applicable to unscheduled closure	Yes	48750	/m3	H1.1	R 35.37	R 1 724 287.50	Based on observations during the site visit in October 2015, it is assumed limited tailings will remain after reprocessing. A rehabilitation specialist recommended that an additional 250mm over 15% of the footprint area should be removed.
		Apply lime to footprint	S-curve	No	0	t	N9	R 1 047.47	R 0.00	Not applicable to unscheduled closure	Yes	2600	t	N9	R 1 047.47	R 2 723 422.00	Apply 20 ton/ha on entire footprint area. 2017 TSF survey information used. 2017 TSF survey information used
		Shaping and levelling of TSF footprint	S-curve	No	0	/ha	G1.1	R 77 152.13	R 0.00	Not applicable to unscheduled closure	Yes	19.5	/ha	G1.1	R 77 152.13	R 1 504 466.54	Shaping/levelling over the excavated footprint areas, assume 15% will require after reprocessing. 2017 TSF survey information used
		Establish drainage lines over footprint area	S-curve	No	0	/ha	G3.1	R 5 786.41	R 0.00	Not applicable to unscheduled closure	Yes	130	/ha	G3.1	R 5 786.41	R 752 233.30	2017 TSF survey information used
		Establish vegetation on footprint area	S-curve	No	0	/ha	G2.1	R 33 820.08	R 0.00	Not applicable to unscheduled closure	Yes	130	/ha	G2.1	R 33 820.08	R 4 396 610.40	2017 TSF survey information used
	2.5.2	**Old Waste Rock Dump**															
		Over-excavate footprint area by 300mm	S-curve	Yes	5175	/m3	H2.1.1	R 33.95	R 175 691.25	Remove waste rock material (Assume 1.5m high). Over-excavate footprint area by 300mm and 15% larger than footprint area and consolidate with closest TSF	No	0	N/A	L1	R 0.00	R 0.00	Assume to be rehabilitated during operations. 2014 quantity 5175m3
		Shape disturbed footprint area to facilitate drainage	S-curve	Yes	1.5	/ha	G1.1	R 77 152.13	R 115 728.20		No	0	N/A	L1	R 0.00	R 0.00	2014 quantity 1.5ha
		Rip to alleviate compaction	S-curve	Yes	1.5	/ha	H3.1	R 5 078.76	R 7 618.14		No	0	N/A	L1	R 0.00	R 0.00	2014 quantity 1.5ha
		Establish vegetation	S-curve	Yes	1.5	/ha	G2.1	R 33 820.08	R 50 730.12		No	0	N/A	L1	R 0.00	R 0.00	2014 quantity 1.5ha
	2.5.3	**Borrow Pit**															
		Shape steep side slopes to a minimum of 1:5	S-curve	Yes	93100	/m3	H4.3	R 12.92	R 1 202 852.00		No	0	N/A	L1	R 0.00	R 0.00	Assume to be rehabilitated during operations. 2014 quantity 93100m3
		General shaping and levelling of footprint areas	S-curve	Yes	2.58	/ha	G1.1	R 77 152.13	R 199 052.50		No	0	N/A	L1	R 0.00	R 0.00	2014 quantity 2.5ha
		Reinstatement of drainage lines	S-curve	Yes	2.58	/ha	G3.1	R 5 786.41	R 14 928.94		No	0	N/A	L1	R 0.00	R 0.00	2014 quantity 2.5ha
		Establish vegetation	S-curve	Yes	2.58	/ha	G2.1	R 33 820.08	R 87 255.81		No	0	N/A	L1	R 0.00	R 0.00	2014 quantity 2.5ha
	2.5.4	**Calcine dump**															
		Remove and dispose remnant calcine on nearest TSF (2015)	S-curve	Yes	12500	/m3	H2.1.1	R 33.95	R 424 375.00	Load and haul within 1km	No	0	N/A	L1	R 0.00	R 0.00	Assume to be rehabilitated during operations.
		Rip to alleviate compaction	S-curve	Yes	1.25	/ha	H3.1	R 5 078.76	R 6 348.45		No	0	N/A	L1	R 0.00	R 0.00	
		Establish vegetation	S-curve	Yes	1.25	/ha	G2.1	R 33 820.08	R 42 275.10		No	0	N/A	L1	R 0.00	R 0.00	
	2.5.5	**Attenuation dam (Fish dam)**															4.61 Ha, quantity was taken from Umhlaba Nov 2013 report
	2.5.5.1	**Scheduled**															
		Load and Haul <1km	S-curve	No	26508	/m3	H2.1.1	R 33.95	R 0.00		Yes	26508	/m3	H2.1.1	R 33.95	R 899 946.60	Over excavate footprint area by 500mm and 15% extra over on footprint area. Transport to closest TSF - 1km
		Rip to alleviate compaction	S-curve	No	4.61	/ha	H3.1	R 5 078.76	R 0.00		Yes	4.61	/ha	H3.1	R 5 078.76	R 23 413.08	
		Shape disturbed footprint area to facilitate drainage	S-curve	No	4.61	/ha	G1.1	R 77 152.13	R 0.00		Yes	4.61	/ha	G1.1	R 77 152.13	R 355 671.32	
		Establish vegetation	S-curve	No	4.61	/ha	G2.1	R 33 820.08	R 0.00		Yes	4.61	/ha	G2.1	R 33 820.08	R 155 910.57	
	2.5.5.2	**Unscheduled**															
		Load and Haul	S-curve	Yes	23050	/m3	H2.1.1	R 33.95	R 782 547.50	Remove upper 500mm of contaminated soil and consolidate with closest TSF. Transport - 1km	No	0	N/A	L1	R 0.00	R 0.00	2014 quantity 23050 m3
		Remove HDPE liner	S-curve	Yes	46100	/m2	F2.1	R 4.77	R 219 897.00		No	0	N/A	L1	R 0.00	R 0.00	2014 quantity 46100 m2
		Breach dam embankment walls	S-curve	Yes	860	/m	G1.8	R 749.40	R 644 484.00	Measured on Google Earth	No	0	N/A	L1	R 0.00	R 0.00	2014 quantity 860 m
		Shape disturbed footprint area to be free draining and to eliminate ponding	S-curve	Yes	4.61	/ha	G1.1	R 77 152.13	R 355 671.32		No	0	N/A	L1	R 0.00	R 0.00	2014 quantity 4.61 ha
		Rip to alleviate compaction	S-curve	Yes	4.61	/ha	H3.1	R 5 078.76	R 23 413.08		No	0	N/A	L1	R 0.00	R 0.00	2014 quantity 4.61 ha
		Establish vegetation	S-curve	Yes	4.61	/ha	G2.1	R 33 820.08	R 155 910.57		No	0	N/A	L1	R 0.00	R 0.00	2014 quantity 4.61 ha
	2.5.6	**Mud ponds**								Area = 46 596m2.Measures aligned to rehabilitation costing (2017)							Area = 46 596m2. Assume mud ponds will be fully rehabilitated by scheduled closure. Measures aligned to rehabilitation costing (2017)
		Excavate sludge and transport to nearest TSF	S-curve	Yes	93192	/m3	H2.1.1	R 33.95	R 3 163 868.40	Material will be sluiced / pumped to the nearest TSF for disposal. 1 km load and haul allowed for (2017)	No	93192	/m3	H2.1.1	R 33.95	R 0.00	For scheduled closure once material is processed it will be sluiced / pumped to the nearest TSF for disposal. 1 km load and haul allowed for (2017)
		Shape disturbed footprint area to be free draining and to eliminate ponding	S-curve	Yes	4.7	/ha	G1.1	R 77 152.13	R 359 498.06		No	4.7	/ha	G1.1	R 77 152.13	R 0.00	
		Apply liming over footprint area	S-curve	Yes	93	t	N9	R 1 047.47	R 97 615.82	20 t per ha	No	93	t	N9	R 1 047.47	R 0.00	20 t per ha
		Rip to alleviate compaction	S-curve	Yes	4.7	/ha	H3.1	R 5 078.76	R 23 664.99		No	4.7	/ha	H3.1	R 5 078.76	R 0.00	
		Establish vegetation	S-curve	Yes	4.7	/ha	G2.1	R 33 820.08	R 157 588.04		No	4.7	/ha	G2.1	R 33 820.08	R 0.00	
	2.5.7	**Peter Wright dam (2015)**															
		Remove 250mm of sediment	S-curve	Yes	15750	/m3	H2.1.1	R 33.95	R 534 712.50	Remove upper 250mm of contaminated soil and consolidate with closest TSF. Transport - 1km. Allowance was made to remove sediment at inlet area and this was assumed 10% of the area.	Yes	15750	/m3	H2.1.1	R 33.95	R 534 712.50	Remove upper 250mm of contaminated soil and consolidate with closest TSF. Transport - 1km. Allowance was made to remove sediment at inlet area and this was assumed 10% of the area.
		Breach embankment wall	S-curve	No	560	/m	G1.8	R 749.40	R 0.00	Dam to be retained as an asset after closure until need for removal has definitively been established (2017)	No	560	/m	G1.8	R 749.40	R 0.00	Dam to be retained as an asset after closure until need for removal has definitively been established (2017)
		Shape disturbed footprint area to be free draining and to eliminate ponding	S-curve	No	63	/ha	G3.1	R 5 786.41	R 0.00		No	63	/ha	G3.1	R 5 786.41	R 0.00	
		Apply liming over footprint area	S-curve	No	63	/ha	H3.1	R 5 078.76	R 0.00		No	63	/ha	H3.1	R 5 078.76	R 0.00	
		Establish vegetation	S-curve	No	63	/ha	G2.1	R 33 820.08	R 0.00		No	63	/ha	G2.1	R 33 820.08	R 0.00	
		Sub-total for Rehabilitation of dirty water impoundments	S-curve						**R 39 747 733.91**							**R 13 070 673.81**	
	2.6	**Rehabilitation of subsided areas**															
	2.6.1	**GENERAL AREA**															
		Allocation for potential rehab of sinkhole formations	S-curve	Yes	10	/ha	G1.2	R 115 728.19	R 1 157 281.90	Allowance was made for 10 ha based on risk identified by Umhlaba_Nov 2013.	Yes	10	/ha	G1.2	R 115 728.19	R 1 157 281.90	Allowance was made for 10 ha based on risk identified by Umhlaba_Nov 2013.
		Sub-total for Rehabilitation of subsided areas	0.00						**R 1 157 281.90**							**R 1 157 281.90**	
		Sub-total for Mining Areas							**R 47 124 867.81**							**R 20 447 807.71**	
	3	**General Surface Rehabilitation**															
	3.1	**Shaft area**															
		General disturbance associated with the shaft area															
		Clean-up of contaminated soils	S-curve	Yes	43050	/m3	H1.5	R 47.14	R 2 029 377.00	Removing 500mm thick contamination over 30% of footprint and consolidating it with the closest TSF prior to reprocessing thereof . Load and haul of 1km. Detailed information on contamination levels is currently not available therefore cost allowance was made to conduct a contaminated land assessment for this area prior to rehabilitation.	Yes	43050	/m3	H1.5	R 47.14	R 2 029 377.00	Removing 500mm thick contamination over 30% of footprint and consolidating it with the closest TSF prior to reprocessing thereof . Load and haul of 1km. Detailed information on contamination levels is currently not available therefore cost allowance was made to conduct a contaminated land assessment for this area prior to rehabilitation.
		Load and haul contaminated soils	S-curve	Yes	43050	/m3	H2.1.1	R 33.95	R 1 461 547.50	Assume load and haul <1km	Yes	43050	/m3	H2.1.1	R 33.95	R 1 461 547.50	Assume load and haul <1km
		Shaping and levelling of footprint area	S-curve	Yes	28.7	/ha	G1.1	R 77 152.13	R 2 214 266.13	Shaping/levelling of infrastructural footprint areas (500 mm)	Yes	28.7	/ha	G1.1	R 77 152.13	R 2 214 266.13	Shaping/levelling of infrastructural footprint areas (500 mm)
		Apply liming over footprint area	S-curve	Yes	574	t	N9	R 1 047.47	R 601 247.78		Yes	574	t	N9	R 1 047.47	R 601 247.78	
		Rip to alleviate compaction	S-curve	Yes	28.7	/ha	H3.1	R 5 078.76	R 145 760.41		Yes	28.7	/ha	H3.1	R 5 078.76	R 145 760.41	
		Vegetation of footprint area	S-curve	Yes	28.7	/ha	G2.1	R 33 820.08	R 970 636.30		Yes	28.7	/ha	G2.1	R 33 820.08	R 970 636.30	
	3.2	**Waste rock area between shaft and Delta**															Excludes waste rock dump as has already been included in mining areas
		General disturbance associated with the plant area															
		Clean-up of contaminated soils	S-curve	Yes	2860	/m3	H1.5	R 47.14	R 134 820.40	Removing 500mm thick contamination over 30% of footprint and consolidating it with the closest TSF prior to reprocessing thereof . Load and haul of 2km. Detailed information on contamination levels is currently not available therefore cost allowance was made to conduct a contaminated land assessment for this area prior to rehabilitation.	Yes	2860	/m3	H1.5	R 47.14	R 134 820.40	Removing 200mm thick contamination over 10% of footprint and consolidating it with the closest TSF prior to reprocessing thereof . Load and haul of 2km. Detailed information on contamination levels is currently not available therefore cost allowance was made to conduct a contaminated land assessment for this area prior to rehabilitation.
		Load and haul contaminated soils	S-curve	Yes	2860	/m3	M2	R 40.58	R 116 058.80	Assume load and haul 2 km	Yes	2860	/m3	M2	R 40.58	R 116 058.80	Assume load and haul 2 km
		Shaping and levelling of footprint area	S-curve	Yes	14.3	/ha	G1.1	R 77 152.13	R 1 103 275.46	Shaping/levelling of infrastructural footprint areas (500 mm)	Yes	14.3	/ha	G1.1	R 77 152.13	R 1 103 275.46	Shaping/levelling of infrastructural footprint areas (500 mm)
		Rip to alleviate compaction	S-curve	Yes	14.3	/ha	H3.1	R 5 078.76	R 72 626.27		Yes	14.3	/ha	H3.1	R 5 078.76	R 72 626.27	
		Vegetation of footprint area	S-curve	Yes	14.3	/ha	G2.1	R 33 820.08	R 483 627.14		Yes	14.3	/ha	G2.1	R 33 820.08	R 483 627.14	
	3.3	**Gold and Uranium Plant Area**															
		General disturbance associated with the plant area															
		Clean-up of contaminated soils	S-curve	Yes	35400	/m3	H1.5	R 47.14	R 1 668 756.00	Removing 500mm thick contamination over 30% of footprint and consolidating it with the closest TSF prior to reprocessing thereof . Load and haul of 1km. Detailed information on contamination levels is currently not available therefore cost allowance was made to conduct a contaminated land assessment for this area prior to rehabilitation.	Yes	35400	/m3	H1.5	R 47.14	R 1 668 756.00	Removing 500mm thick contamination over 30% of footprint and consolidating it with the closest TSF prior to reprocessing thereof . Load and haul of 1km. Detailed information on contamination levels is currently not available therefore cost allowance was made to conduct a contaminated land assessment for this area prior to rehabilitation.
		Load and haul contaminated soils	S-curve	Yes	35400	/m3	M2	R 40.58	R 1 436 532.00	Assume load and haul 2 km	Yes	35400	/m3	M2	R 40.58	R 1 436 532.00	Assume load and haul 2 km
		Shaping and levelling of footprint area	S-curve	Yes	23.6	/ha	G1.1	R 77 152.13	R 1 820 790.27	Shaping/levelling of infrastructural footprint areas (500 mm)	Yes	23.6	/ha	G1.1	R 77 152.13	R 1 820 790.27	Shaping/levelling of infrastructural footprint areas (500 mm)
		Apply liming over footprint area	S-curve	Yes	472	t	N9	R 1 047.47	R 494 405.84		Yes	472	t	N9	R 1 047.47	R 494 405.84	
		Rip to alleviate compaction	S-curve	Yes	23.6	/ha	H3.1	R 5 078.76	R 119 858.74		Yes	23.6	/ha	H3.1	R 5 078.76	R 119 858.74	
		Vegetation of footprint area	S-curve	Yes	23.6	/ha	G2.1	R 33 820.08	R 798 153.89		Yes	23.6	/ha	G2.1	R 33 820.08	R 798 153.89	
	3.4	**Hostel**															
		General disturbance associated with the hostel area															
		Clean-up of contaminated soils	S-curve	Yes	6980	/m3	H1.5	R 47.14	R 329 037.20	Removing 500mm thick contamination over 30% of footprint and consolidating it with the closest TSF prior to reprocessing thereof . Load and haul of 1km. Detailed information on contamination levels is currently not available therefore cost allowance was made to conduct a contaminated land assessment for this area prior to rehabilitation.	Yes	6980	/m3	H1.5	R 47.14	R 329 037.20	Removing 200mm thick contamination over 10% of footprint and consolidating it with the closest TSF prior to reprocessing thereof . Load and haul of 1km. Detailed information on contamination levels is currently not available therefore cost allowance was made to conduct a contaminated land assessment for this area prior to rehabilitation.
		Load and haul contaminated soils	S-curve	Yes	6980	/m3	M2	R 40.58	R 283 248.40	Assume load and haul 2 km	Yes	6980	/m3	M2	R 40.58	R 283 248.40	Assume load and haul 2 km
		Shaping and levelling of footprint area	S-curve	Yes	34.9	/ha	G1.1	R 77 152.13	R 2 692 609.34	Shaping/levelling of infrastructural footprint areas (500 mm)	Yes	34.9	/ha	G1.1	R 77 152.13	R 2 692 609.34	Shaping/levelling of infrastructural footprint areas (500 mm)
		Rip to alleviate compaction	S-curve	Yes	34.9	/ha	H3.1	R 5 078.76	R 177 248.72		Yes	34.9	/ha	H3.1	R 5 078.76	R 177 248.72	
		Vegetation of footprint area	S-curve	Yes	34.9	/ha	G2.1	R 33 820.08	R 1 180 320.79		Yes	34.9	/ha	G2.1	R 33 820.08	R 1 180 320.79	
	3.5	**Explosives Magazine area**															
		Rip to alleviate compaction	S-curve	Yes	2.83	/ha	H3.1	R 5 078.76	R 14 372.89		Yes	2.83	/ha	H3.1	R 5 078.76	R 14 372.89	
		Establish vegetation	S-curve	Yes	2.83	/ha	G2.1	R 33 820.08	R 95 710.83		Yes	2.83	/ha	G2.1	R 33 820.08	R 95 710.83	
	3.6	**Disturbed area between the plant and Peter wright dam (2015)**															
		Remove 250mm of sediment	S-curve	Yes	74250	/m3	H2.1.1	R 33.95	R 2 520 787.50	Dispose on nearest TSF within 1km	Yes	74250	/m3	H2.1.1	R 33.95	R 2 520 787.50	Dispose on nearest TSF within 1km
		Shape disturbed footprint area to be free draining and to eliminate ponding	S-curve	Yes	29.7	/ha	G3.1	R 5 786.41	R 171 856.38		Yes	29.7	/ha	G3.1	R 5 786.41	R 171 856.38	
	3.7	**Zama Zama area (2015)**								Based on site visit observation October 2015. The dump dimentions 1m high x 5m wide x 20m long.							Based on site visit observation October 2015. The dump dimentions 1m high x 5m wide x 20m long.
		Remove stockpiled material and dispose on closest rock dump	S-curve	Yes	100	/m3	H2.1.1	R 33.95	R 3 395.00	Dispose on nearest TSF within 1km	Yes	100	/m3	H2.1.1	R 33.95	R 3 395.00	Dispose on nearest TSF within 1km
		Establish vegetation	S-curve	Yes	0.01	/ha	G2.1	R 33 820.08	R 338.20		Yes	0.01	/ha	G2.1	R 33 820.08	R 338.20	
	3.8	**Black wattle (2015)**	S-curve														
		Remove all alien vegetation	S-curve	Yes	27.75	/ha	G2.6	R 6 399.89	R 177 596.95	Remove trees over 15% of the area	Yes	27.75	/ha	G2.6	R 6 399.89	R 177 596.95	Remove trees over 15% of the area
		Establish vegetation	S-curve	Yes	27.75	/ha	G2.1	R 33 820.08	R 938 507.22		Yes	27.75	/ha	G2.1	R 33 820.08	R 938 507.22	
	3.9	**General area between Ezulwini TSF and Dump 4**															
		Reinstatement of drainage lines from Ezulwini TSF to adjacent water course	S-curve	No	0	N/A	L1	R 0.00	R 0.00	Not applicable as TSF will be placed in holding pattern and penstock dams repaired	Yes	27	/ha	G3.1	R 5 786.41	R 156 233.07	Minimal profiling of downslope areas to ensure free-draining of rehabilitated TSF footprint to adjacent watercourse

1896352 Sibanye Ezulwini Mine Closure Costs, as at December 2018																		
Ezulwini																		
Ref.		Closure Component (Select)	Cash flowed costs expensed method	Unscheduled Closure (2018)							Scheduled Closure (2027)						
				Applicable	Quantity	Unit	Unit rate code	Unit rate	Total cost	Notes	Applicable	Quantity	Unit	Unit rate code	Unit rate	Total cost	Notes
		Reinstatement of drainage lines from Dump 4 to adjacent water course	S-curve	No	0	N/A	L1	R 0.00	R 0.00	Not applicable as TSF will be placed in holding pattern and penstock dams repaired	Yes	30	/ha	G3.1	R 5 786.41	R 173 592.30	Minimal profiling of downslope areas to ensure free-draining of rehabilitated TSF footprint to adjacent watercourse
		Remove salinated soils downslope of Dump 4 and consolidate with dump	S-curve	Yes	12000	/m3	H2.1.1	R 33.95	R 407 400.00	Remove 150mm and dispose on nearest TSF within 1km	Yes	12000	/m3	H2.1.1	R 33.95	R 407 400.00	Remove 150mm and dispose on nearest TSF within 1km
	3.10	**Wetland rehabilitation**								Measures added 2017, as aligned to 2017 rehabilitation plan for Ezulwini							Measures added 2017, as aligned to 2017 rehabilitation plan for Ezulwini. Assume wetland/Vlei will be rehabilitated by scheduled closure as indicated in the rehabilitation plan (2017)
		Remove sediment	S-curve	Yes	55600	/m3	H1.1	R 35.37	R 1 966 572.00	Wetland area: 27.8 ha. Excavate 200 mm of sediment	No	55600	/m3	H1.1	R 35.37	R 0.00	Wetland area: 27.8 ha. Excavate 200 mm of sediment
		Load and haul sediment	S-curve	Yes	55600	/m3	H2.1.1	R 33.95	R 1 887 620.00	Load and haul sediment to nearest TSF for disposal (1 km)	No	55600	/m3	H2.1.1	R 33.95	R 0.00	Load and haul sediment to nearest TSF for disposal (1 km)
		Reinstate drainage lines	S-curve	Yes	15.7	/ha	G3.1	R 5 786.41	R 90 846.64		No	15.7	/ha	G3.1	R 5 786.41	R 0.00	
		Re-establish wetland vegetation	S-curve	Yes	15.7	/ha	G2.1	R 33 820.08	R 530 975.26		No	15.7	/ha	G2.1	R 33 820.08	R 0.00	
		Leeuspruit, KleinWes Rietspruit and other affected water bodies rehabilitation	S-curve	Yes	1	sum	N27	R 10 000 000.00	R 10 000 000.00	Provisional sum added in 2018, based on Sibanye 2019 budget allocation (communicated in 2018)	No	1	sum	N27	R 10 000 000.00	R 0.00	Assume complted at scheduled closure
		Sub-total for General Surface Rehabilitation	**S-curve**						**R 39 140 183.23**							**R 24 993 994.71**	
	4	**Surface water reinstatement**															
		Not applicable	S-curve	No	0	N/A	L1	R 0.00	R 0.00	Included under 3.9 (above)	No	0	N/A	L1	R 0.00	R 0.00	Included under 3.9 (above)
		Sub-total for Surface water reinstatement	**S-curve**						**R 0.00**							**R 0.00**	
		Sub-Total 1 (for infrastructure and related aspects)							**R 130 234 459.49**							**R 71 831 427.15**	
	5	**P&Gs, Contingencies and Additional Allowances**															
	5.1	Preliminaries and general	S-curve	Yes	1	/sum	L2	R 15 628 135.14	R 15 628 135.14	Assumed 12% of Sub-total 1	Yes	1	/sum	L2	R 8 619 771.26	R 8 619 771.26	Assumed 12 % of Sub-total 1
	5.2	Contingencies	S-curve	Yes	1	/sum	L2	R 10 746 089.04	R 10 746 089.04	Assumed 7.5% of infrastructural and mining aspects and 10% of surface rehabilitation aspects	Yes	10	/sum	L2	R 6 012 206.90	R 6 012 206.90	Assumed 7.5% of infrastructural and mining aspects and 10% of surface rehabilitation aspects
		Sub-total for P's and G's and contingencies	S-curve						**R 26 374 224.18**							**R 14 631 978.16**	
	5.3	Additional studies (to redefine RSIP going forward)															
	5.3.1	Radioactivity decommissioning study (2017)	S-curve	Yes	1	/ha	N4	R 400 000.00	R 400 000.00	Nominal allowance for radiation scan of plant and all shaft areas (amended 2018)	No	1	/ha	N4	R 400 000.00	R 0.00	Assumed completd at scheduled closure
	5.3.2	Radiation scan after removal of mud ponds sludge	S-curve	Yes	1	/ha	N15	R 91 306.00	R 91 306.00		No	1	/ha	N15	R 91 306.00	R 0.00	Assumed completd at scheduled closure
	5.3.3	Cooke 4 Contaminated land assessment for Shaft area (excl. implementation of measures)	S-curve	Yes	1	sum	N6	R 75 000.00	R 75 000.00	Small/less contaminated plant sites (i.e. 10% footprint contamination to depth of 250 mm).	No	1	sum	N6	R 75 000.00	R 0.00	Assumed completd at scheduled closure
	5.3.4	Cooke 4 Contaminated land assessment for Uranium plant (excl. implementation of measures)	S-curve	Yes	1	sum	N5	R 75 000.00	R 75 000.00	Moderately to heavy/large contaminated plant sites (.1. 30% footprint contamination to depth of 500 mm)	No	1	sum	N5	R 75 000.00	R 0.00	Assumed completd at scheduled closure
	5.3.5	Conduct waste assessment to determine whether mud ponds sludge is hazardous and associated post-rehabilitation requirements	S-curve	Yes	1	/ha	N13	R 150 000.00	R 150 000.00	Order of magnitude costs provided by Golder specialist	No	1	/ha	N13	R 150 000.00	R 0.00	Assumed completd at scheduled closure
	5.3.6	Infrastructure third-party transfer feasibility pilot study based on Ezulwini housing units and associated infrastructure	S-curve	Yes	1	/ha	N28	R 350 000.00	R 350 000.00		No	1	/ha	N13	R 150 000.00	R 0.00	Assumed completd at scheduled closure
	5.3.7	TSF geochemical characterisation	S-curve	Yes	1	/ha	N25	R 250 000.00	R 250 000.00		No	1	/ha	N25	R 250 000.00	R 0.00	Assumed completd at scheduled closure
	5.3.8	Engineering cover designs and landform profiling designs for all in-situ rehabilitated TSFs	S-curve	Yes	1	/ha	N26	R 350 000.00	R 350 000.00		No	1	/ha	N26	R 350 000.00	R 0.00	Assumed completd at scheduled closure
	5.3.9	Integrated specialist study to identify and scope surface contamination, surface and groundwater remediation and management requirements	S-curve	Yes	1	sum	N7	R 250 000.00	R 250 000.00	Sum allowance based on various communications with Sibanye in 2018 and projected budget allocations for 2019	No	1	sum	N7	R 250 000.00	R 0.00	Assumed completd at scheduled closure
	5.3.10	Structures cracking photographic assessment	S-curve	Yes	1	/ha	N38	R 15 000.00	R 15 000.00	Conduct photographic survey of existing cracking for all existing surrounding structures prior to rewatering	No	1	/ha	N38	R 15 000.00	R 0.00	Assumed completd at scheduled closure
	5.3.11	Sinkole and subsidence LIDAR monitoring	S-curve	Yes	1	sum	N39	R 2 750 000.00	R 2 750 000.00	Conduct 10 cm LIDAR subsidence monitoring of Ezulwini underground workings area annually for a period of 10 years after rewatering commences. Costs for pre-pumping cessation and mine re-watering LIDAR monitoring not included, as it was assumed this cost is budgeted for elsewhere	Yes	1	sum	N39	R 2 750 000.00	R 2 750 000.00	Conduct 10 cm LIDAR subsidence monitoring of Ezulwini underground workings area annually for a period of 10 years after rewatering commences. Costs for pre-pumping cessation and mine re-watering LIDAR monitoring not included, as it was assumed this costs is budgeted for elsewhere
		Sub-total for additional studies	S-curve						**R 4 756 306.00**							**R 2 750 000.00**	
		Sub-Total 2 (for Additional Allowances)							**R 31 130 530.18**							**R 17 381 978.16**	
	6	**Post Closure Aspects**															
	6.1	Initial rehabilitation monitoring and aftercare								Note: Costs for pre-pumping cessation and mine re watering surface and groundwater, wetlands, aquatics and biomonitoring not included, as it was assumed these costs are budgeted for elsewhere							Note: Costs for pre-pumping cessation and mine re-watering surface and groundwater, wetlands, aquatics and biomonitoring not included, as it was assumed these costs are budgeted for elsewhere
	6.1.1	Surface water monitoring	S-curve	Yes	10	/yr	K1	R 342 078.00	R 3 420 780.00	Assume 10 years of monitoring 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	Yes	10	/yr	K1	R 342 078.00	R 3 420 780.00	Assume 10 years of monitoring 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
	6.1.2	Wetlands, biomonitoring and aquatics monitoring	S-curve	Yes	10	/yr	N41	R 126 000.00	R 1 260 000.00	Wetlands, biomonitoring and aquatics monitoring as per EMPr, incorporating all relevant monitoring plans (monthly SW quality for 10 years, biannual biomonitoring for 3 years and annual PES,EIS and Ecosystem Services for 3 years on Leeuspruit & KleinWes, but for 10 years on Wonderfonteinspruit).	Yes	10	/yr	N41	R 126 000.00	R 1 260 000.00	Wetlands, biomonitoring and aquatics monitoring as per EMPr, incorporating all relevant monitoring plans (monthly SW quality for 10 years, biannual biomonitoring for 3 years and annual PES,EIS and Ecosystem Services for 3 years on Leeuspruit & KleinWes, but for 10 years on Wonderfonteinspruit).
	6.1.3	Groundwater monitoring	S-curve	Yes	10	/yr	K2	R 165 994.40	R 1 659 944.00	Groundwater monitoring at 28 boreholes. 6 must be monitored for GW quality and all for GW levels. Assume 10 years of monitoring, by which time decant at Gemsbokfontein 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	Yes	10	/yr	K2	R 165 994.40	R 1 659 944.00	Groundwater monitoring at 28 boreholes. 6 must be monitored for GW quality and all for GW levels. Assume 10 years of monitoring, by which time decant at Gemsbokfontein 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
	6.1.4	Rehabilitation monitoring	S-curve	Yes	202.1	ha/5yrs	J1	R 2 322.63	R 469 379.37	Sum of rehabilitation areas	Yes	363.4	ha/5yrs	J1	R 2 322.63	R 844 043.74	Sum of rehabilitation areas
	6.1.5	Care and maintenance	S-curve	Yes	202.1	ha/5yrs	J2	R 34 045.00	R 6 880 140.43	Sum of rehabilitation areas	Yes	363.4	ha/5yrs	J2	R 34 045.00	R 12 371 953.00	Sum of rehabilitation areas
	6.1.6	TSF extensive care and maintenace (Unscheduled)	S-curve	Yes	99	/ha	N12	R 51 067.50	R 5 076 109.50		No	0	/ha	N12	R 51 067.50	R 0.00	
	6.2	Post-closure water quality monitoring															
	6.2.1	Post-decant groundwater monitoring	S-curve	Yes	5	/yr	N34	R 33 198.88	R 165 994.40	Post-decant groundwater quality monitoring at 3 locations (upstream-, at- and downstream of Gemsbokfontein Eye decant point), 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	Yes	5	/yr	N34	R 33 198.88	R 165 994.40	Post-decant groundwater quality monitoring at 3 locations (upstream-, at- and downstream of Gemsbokfontein Eye decant point), 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
	6.2.2	Post-decant surface water and sediment radioactivity monitoring	S-curve	Yes	5	/yr	N35	R 171 039.00	R 855 195.00	Post-decant surface water quality monitoring at 3 locations (upstream-, at- and downstream of Gemsbokfontein Eye decant point), as well as sampling of and NECSA laboratory analysis of Kleinwes and Leeuspruit 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	Yes	5	/yr	N35	R 171 039.00	R 855 195.00	Post-decant surface water quality monitoring at 3 locations (upstream-, at- and downstream of Gemsbokfontein Eye decant point), as well as sampling of and NECSA laboratory analysis of Kleinwes and Leeuspruit 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
		Post-closure aspects	S-curve						**R 19 787 542.70**							**R 20 577 910.14**	
	6.3	Contingencies for post-closure aspects								Note to post-closure contingencies: Sibanye's gold mining operations in the region will continue for approximately two decades, and Sibanye will have the ability to intervene and address/manage post-closure aspects if and when these occur, and is also in the process of developing a holistic and integrated post-closure mine water strategy for all of its mines in the region. Furthermore, whether or not any of the potential post-closure interventions as indicated may be required is at present unknown, and will only become known once rewatering of the underground workings is complete and decant occurs. Hence, these cost allowances are for *potential* occurrences and are therefore included as post-closure contingencies, and will be reviewed and updated as more information becomes available							Note to post-closure contingencies: Sibanye's gold mining operations in the region will continue for approximately two decades, and Sibanye will have the ability to intervene and address/manage post-closure aspects if and when these occur, and is also in the process of developing a holistic and integrated post-closure mine water strategy for all of its mines in the region. Furthermore, the likelihood that the potential post-closure interventions as indicate mqy be required is at present unknown, and will only become known once rewatering of the underground workings is complete and decant occurs. Hence, these cost allowances are for potential occurrences and are therefore included as post-closure contingencies, and will be reviewed and updated as more information becomes available
	6.3.1	Potential emergency halting of re-watering	S-curve	Yes	1	sum	N36	R 60 950 000.00	R 60 950 000.00	Allows for installation of 2 x ANDRITZ dewatering pumps, pipelines, associated equipment and ancillary support work	Yes	1	sum	N36	R 60 950 000.00	R 60 950 000.00	Allows for installation of 2 x ANDRITZ dewatering pumps, pipelines, associated equipment and ancillary support work
	6.3.2	Possible re-watering sinkhole rehabilitation costs	S-curve	Yes	1	sum	N37	R 7 060 000.00	R 7 060 000.00	Allowance to repair potential post-rewatering damage to open land, highways, railway lines and residences	Yes	1	sum	N37	R 7 060 000.00	R 7 060 000.00	Allowance to repair potential post-rewatering damage to open land, highways, railway lines and residences
	6.3.3	Possible relocation of existing 5ML Ezulwini WTP	S-curve	Yes	1	sum	N40	R 8 000 000.00	R 8 000 000.00	Estimated costs to relocated the existing Ezulwini 5ML water treatment plant to the Gemsbokfontein eye decant point, should poor quality water decant	Yes	1	sum	N40	R 8 000 000.00	R 8 000 000.00	Estimated costs to relocated the existing Ezulwini 5ML water treatment plant to the Gemsbokfontein eye decant point, should poor quality water decant
		Sub-total for post-closure contingency aspects	#REF!						**R 76 010 000.00**							**R 76 010 000.00**	
		Sub-Total 3 (for Post-Closure aspects)							**R 95 797 542.70**							**R 96 587 910.14**	
		Grand Total Excl. VAT. (for Sub-total 1 +2 +3)							**R 257 162 532.37**							**R 185 801 315.46**	

UNIT RATES FOR DEMOLITION, EARTHWORKS, REHABILITATION AND RELATED WORK, as at December 2018							December 2018
Ref nr			Currency	Unit Rate	Unit	Comment	Base rate	1.0000
A	Concrete						2018/12/31	Applied unit rate
A1	**Demolition of concrete structures**							
A1.1	Very heavy concrete with thickness greater than 750 mm	:	Rands	1 547.78	/m^3	Demolition cost of reinforced concrete, excluding screening & sorting and disposal of waste	R 1 547.78	R 1 547.78
A1.2	Heavy concrete with thickness 500 - 750 mm	:	Rands	1 159.16	/m^3	Demolition cost, excluding screening & sorting and disposal of waste	R 1 159.16	R 1 159.16
A1.3	Medium concrete with thickness between 250 and 500 mm	:	Rands	770.54	/m^3	Demolition cost, excluding screening & sorting and disposal of waste	R 770.54	R 770.54
A1.4	Light concrete thickness less than 250 mm	:	Rands	489.12	/m^3	Demolition cost, excluding screening & sorting and disposal of waste	R 489.12	R 489.12
A2	**Demolition of concrete floors, bases and foundations**					Based on unit rates A1		
A2.1	Strip foundation	:	Rands	161.81	/m	Reinforced (0.35 m x 0.6m x 1 m x Medium concrete unit rate)	R 161.81	R 161.81
A2.2	Column footing	:	Rands	1 300.29	/unit	(1.5 m x 1.5 m x 0.75 m) x (Medium concrete unit rate)	R 1 300.29	R 1 300.29
A2.3	Bases and floors after removal of super structures	:	Rands	269.69	/m^2	Reinforced (0.35 m x 1 m^2 x Medium concrete unit rate)	R 269.69	R 269.69
A2.4	Heavy duty floors and bases after removal of super structure	:	Rands	385.27	/m^2	0.5 m x 1 m^2 x Medium concrete unit rate	R 385.27	R 385.27
A2.5	Concrete slabs < 200 mm thick , no reinforcement	:	Rands	97.82	/m^2	Excludes disposal (Light concrete unit rate x 0.20 m)	R 97.82	R 97.82
A2.6	Concrete slabs < 250 mm, no reinforcement	:	Rands	122.28	/m^2	Excludes disposal (Light concrete unit rate x 0.25 m)	R 122.28	R 122.28
A2.7	Dam concrete liner 150 mm thickness	:	Rands	73.37	/m^2	Removal of 150 mm thick concrete liner, excluding disposal. [0.150 m x Light concrete unit rate]	R 73.37	R 73.37
A3	**Concrete crushing**							
A3.1	Crush concrete to aggregate	:	Rands	206.43	/m^3	Crushing concrete to 75 mm aggregate.	R 206.43	R 206.43
B	**Steel structures and equipment**							
B1	**Demolition of steel buildings and related infrastructure (Including Sheeting)**					Based on unit rated of B2		
B1.1	Light plant or structures	:	Rands	319.59	/m²	Up to 300 kg of steel per square metre. Includes sheeting	R 319.59	R 319.59
B1.2	Light/medium plant or structures	:	Rands	667.80	/m²	Up to 500 kg of steel per square metre. Includes sheeting	R 667.80	R 667.80
B1.3	Medium plant or structures	:	Rands	1 288.96	/m²	Up to 800 kg of steel per square metre. Includes sheeting	R 1 288.96	R 1 288.96
B1.4	Medium/heavy plant or structures	:	Rands	2 289.60	/m²	Up to 1200 kg of steel per square metre. Includes sheeting	R 2 289.60	R 2 289.60
B1.5	Heavy plant structures	:	Rands	3 307.20	/m²	Up to 1500 kg of steel per square metre. Includes sheeting	R 3 307.20	R 3 307.20
B1.6	Very heavy plant structures	:	Rands	4 006.80	/m^2	Up to 1750 kg of steel per square metre. Includes sheeting	R 4 006.80	R 4 006.80
B2	**Demolition of steel structures**							
B2.1	Steel structures: light	:	Rands	1 065.30	/t	As per Jet demolition	R 1 065.30	R 1 065.30
B2.2	Steel structures: medium	:	Rands	1 611.20	/t	As per Jet demolition	R 1 611.20	R 1 611.20
B2.3	Steel structures: medium/heavy	:	Rands	1 908.00	/t	As per Jet demolition	R 1 908.00	R 1 908.00
B2.4	Steel structures: heavy	:	Rands	2 204.80	/t	As per Jet demolition	R 2 204.80	R 2 204.80
B3	**Demolition of permanent shed type structures**							
B3.1	0m – 5m high	:	Rands	75.04	/m^2	Includes sheeting. Cost based on unit rate B1.1, light steel 80 kg/m2	R 75.04	R 75.04
B3.2	5m – 10m high	:	Rands	132.02	/m^2	Includes sheeting. Cost based on unit rate B1.1, light steel 80 kg/m2	R 132.02	R 132.02
B3.3	10m – 15m high	:	Rands	224.64	/m^2	Includes sheeting. Cost based on unit rate B1.1, light steel 80 kg/m2	R 224.64	R 224.64
B3.4	15m – 20m high	:	Rands	321.54	/m^2	Includes sheeting. Cost based on unit rate B1.1, light steel 80 kg/m2	R 321.54	R 321.54
B4	**Crane hire and use**							
B4.1	120 ton Crane hire	:	:	39 629.04	/d	Rate per 10 h/day, Include site establishment and personnel accommodation, assuming a minimum of 10 days on site. As per Johnson Crane hire	R 39 629.04	R 39 629.04
B4.2	220 ton Crane hire	:	:	75 022.20	/d	Rate per 10 h/day, Include site establishment and personnel accommodation, assuming a minimum of 10 days on site. As per Johnson Crane hire	R 75 022.20	R 75 022.20
B5	**Demolition of steel tanks and dams with rubber lining**							
B5.1	≤5m diameter	:	Rands	6 797.85	/tank	Cost includes an allowance for removal of liner, and excludes demolition of support structure and concrete base	R 6 797.85	R 6 797.85
B5.2	5m - 10m diameter	:	Rands	22 417.81	/tank	Cost includes an allowance for removal of liner, and excludes demolition of support structure and concrete base	R 22 417.81	R 22 417.81
B5.3	10 - 15m diameter	:	Rands	48 944.55	/tank	Cost includes an allowance for removal of liner, and excludes demolition of support structure and concrete base	R 48 944.55	R 48 944.55
B5.4	15 - 20m diameter	:	Rands	89 187.84	/tank	Cost includes an allowance for removal of liner, and excludes demolition of support structure and concrete base	R 89 187.84	R 89 187.84
B5.5	20 - 30m diameter	:	Rands	221 338.12	/tank	Cost includes an allowance for removal of liner, and excludes demolition of support structure and concrete base	R 221 338.12	R 221 338.12
B5.6	30 - 45m diameter	:	Rands	595 763.90	/tank	Cost includes an allowance for removal of liner, and excludes demolition of support structure and concrete base	R 595 763.90	R 595 763.90
B5.7	Unlined steel tanks - 5m dia	:	Rands	5 911.18	/tank		R 5 911.18	R 5 911.18
B6	**Dismantling of cable racks**							
B6.1	Cable rack - general	:	Rands	31.96	/m	Light steel structure of 30 kg/m	R 31.96	R 31.96
B7	**General steel aspects**							
B7.1	Cladding and sheeting	:	Rands	19.07	/m^2	Steel sheeting	R 19.07	R 19.07
B7.2	Car ports (IBR roof)	:	Rands	49.21	/m^2	Excluding paving	R 49.21	R 49.21
B7.3	Car ports (shade net)	:	Rands	30.14	/m^2	Excluding paving	R 30.14	R 30.14
B7.4	Substations	:	Rands	602.80	/m^2	Soft strip substation infrastructure before demolition, excludes brick building and disposal of waste	R 602.80	R 602.80
C	**Demolition of buildings and structures**							
C1	Normal one storey brick buildings	:	Rands	391.29	/m^2	Soft strip before demolition, excludes disposal of waste. As per Jet Demolition (0.8m3m2 of light concrete)	R 391.29	R 391.29
C2	Normal double storey brick buildings	:	Rands	704.33	/m^2	Soft strip before demolition, excludes disposal of waste As per Jet Demolition	R 704.33	R 704.33
C3	Single brick wall (110mm)	:	Rands	15.61	/m	Free standing single brick wall 110 mm thick x 2000 mm high x per running meter	R 15.61	R 15.61
C4	Double brick wall (220mm)	:	Rands	22.71	/m	Free standing double brick wall 220 mm thick x 2000 mm high x per running meter	R 22.71	R 22.71
C5	Prefabricated Buildings	:	Rands	97.82	/m^2	As per Jet Demolition (factor of 0.25 of brick buildings)	R 97.82	R 97.82
C6	Fibre reinforced walls	:	Rands	7.81	/m	As per Jet Demolition (half the cost of single brick wall)	R 7.81	R 7.81
C7	Removal of timber structures	:	Rands	195.65	/m^2	As per Jet Demolition (half the cost of brick building)	R 195.65	R 195.65
	Asbestos							
C8	Upfront preparation for asbestos removal	:	Rands	286 218.48	sum	Preparing area for removal of asbestos material	R 286 218.48	R 286 218.48
C9	Dismantling of asbestos	:	Rands	183.50	/m^2	Removal of asbestos material, excluding disposal (note: apply applicable hazardous waste disposal cost)	R 183.50	R 183.50
D	**Linear infrastructure**							
D1	**Conveyors**							
D1.1	**Demolition of overland conveyors**							
D1.1.1	Overland conveyors - light, without cladding	:	Rands	398.20	/m	Single conveyor including dismantling of steel and demolition of concrete footings, excludes disposal of waste. Assumes 180kg / m	R 398.20	R 398.20
D1.1.2	Overland conveyors - light, with cladding	:	Rands	457.93	/m	Single conveyor including dismantling of steel and demolition of concrete footings, excludes disposal of waste. Assumes 180kg / m and 15% for cladding	R 457.93	R 457.93
D1.1.3	Overland conveyors - medium, without cladding	:	Rands	451.44	/m	Single conveyor including dismantling of steel and demolition of concrete footings, excludes disposal of waste. Assumes 230kg / m	R 451.44	R 451.44
D1.1.4	Overland conveyors - medium, with cladding	:	Rands	519.16	/m	Single conveyor including dismantling of steel and demolition of concrete footings, excludes disposal of waste. Assumes 230kg / m and 15% for cladding	R 519.16	R 519.16
D1.1.5	Overland conveyors - heavy, without cladding	:	Rands	525.99	/m	Single conveyor including dismantling of steel and demolition of concrete footings, excludes disposal of waste. Assumes 300kg / m	R 525.99	R 525.99
D1.1.6	Overland conveyors - heavy, with cladding	:	Rands	604.88	/m	Single conveyor including dismantling of steel and demolition of concrete footings, excludes disposal of waste. Assumes 300kg / m and 15% for cladding	R 604.88	R 604.88
D1.2	**Demolition of suspended conveyors**							
D1.2.1	Suspended conveyors - light, without cladding	:	Rands	497.75	/m	Single conveyor including dismantling of steel, support structures and demolition of concrete footings, excludes disposal of waste. Included a 25% premium on overland conveyors	R 497.75	R 497.75
D1.2.2	Suspended conveyors - light, with cladding	:	Rands	572.41	/m	Single conveyor including dismantling of steel, support structures and demolition of concrete footings, excludes disposal of waste. Included a 25% premium on overland conveyors	R 572.41	R 572.41
D1.2.3	Suspended conveyors - medium	:	Rands	648.95	/m	Single conveyor including dismantling of steel, support structures and demolition of concrete footings, excludes disposal of waste. Included a 25% premium on overland conveyors	R 648.95	R 648.95

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D1.2.4	Suspended conveyors - heavy, without cladding	:	Rands	657.48	/m	Single conveyor including dismantling of steel, support structures and demolition of concrete footings, excludes disposal of waste. Included a 25% premium on overland conveyors	R 657.48	R 657.48
D1.2.5	Suspended conveyors - heavy, with cladding	:	Rands	756.10	/m	Single conveyor including dismantling of steel, support structures and demolition of concrete footings, excludes disposal of waste. Included a 25% premium on overland conveyors	R 756.10	R 756.10
D2	**Demolition of overland power lines**							
D2.1	Minor power lines	:	Rands	26.50	/m	< 11 kV (local lines, usually wooden poles). Assume 1 km / day, therefore approximately 20 poles demolished per day	R 26.50	R 26.50
D2.2	Major power lines	:	Rands	66.25	/m	> 11 kV (not usually used because transferred to service provider). Assume 500 m per day, 25% added premium for additional steel handling at a cost of R25 000 / day	R 66.25	R 66.25
D3	**Demolition of pipelines**							
D3.1	Overland steel pipeline on plinths (< 200 mm)	:	Rands	48.33	/m	5m plinths spacing, includes disposal of waste @ 10 km	R 48.33	R 48.33
D3.2	Overland steel pipeline on plinths (200-350mm)	:	Rands	85.33	/m	5m plinths spacing, includes disposal of waste @ 10 km	R 85.33	R 85.33
D3.3	Overland steel pipeline on plinths (350-500mm)	:	Rands	139.09	/m	5m plinths spacing, includes disposal of waste @ 10 km	R 139.09	R 139.09
D3.4	Overland steel pipeline on plinths (500-1000mm)	:	Rands	218.81	/m	5m plinths spacing, includes disposal of waste @ 10 km	R 218.81	R 218.81
D3.5	Suspended steel pipeline	:	Rands	175.67	/m	Includes removal of support structures	R 175.67	R 175.67
D3.6	HDPE pipelines (< 350mm)	:	Rands	17.66	/m	Assume 1.5 km a day at R15 000 labour plus R10000 cutting cost	R 17.66	R 17.66
D3.7	HDPE pipelines (350mm - 500mm)	:	Rands	26.49	/m	Assume 1 km a day at R15 000 labour plus R10000 cutting cost	R 26.49	R 26.49
D4	**Demolition of cabling**							
D4.1	Copper cables	:	Rands	1 032.17	/t	Removal and dismantling of copper cables	R 1 032.17	R 1 032.17
D5	**Railway lines**							
D5.1	Demolition of electrified medium gauge railway line	:	Rands	243.67	/m	Demolish rail tracks, sleepers and collect ballast for local stockpiling for re-use. Assumed removal of overhead powerlines at 0.75 of overhead powerlines	R 243.67	R 243.67
D5.2	Demolition of non-electrified medium gauge railway line	:	Rands	193.61	/m	Demolish rail tracks, sleepers and collect ballast for local stockpiling for re-use.	R 193.61	R 193.61
E	**Removal of roads, paving and walkways**							
E1	Tar roads with 500 - 600mm layerworks	:	Rands	62.81	/m^2	Layerworks buried in trench next to road , but excludes the disposal of tar as this will be stockpiled for beneficial re-use by local Municipalities. Assume asphalt thickness of 750 mm	R 62.81	R 62.81
E2	Haul roads	:	Rands	25.57	/m^2	Include ripping, dozing (D9), shaping/level and vegetation of road, excludes veneer clean-up at a road width of 45 m	R 25.57	R 25.57
E3	Gravel road with engineered surface	:	Rands	50.21	/m^2	Roads where layerworks is stabilised with cement. ripping, profiled and vegetated	R 50.21	R 50.21
E4	Normal gravel roads	:	Rands	10.48	/m^2	Gravel roads without layerworks or stabilisation of layerworks - ripping, profiled and vegetated	R 10.48	R 10.48
E5	Two track gravel road	:	Rands	6.39	/m		R 6.39	R 6.39
E6	Hard stand	:	Rands	59.75	/m^2	Excluding disposal	R 59.75	R 59.75
E7	Brick paving	:	Rands	21.63	/m^2	Excluding disposal (note: included in demolition waste calculator, disposal costs to be assigned)	R 21.63	R 21.63
F	**Shafts, inclines and dam impoundments**							
F1	**Plugging/sealing of shafts**							
F1.1	Sealing of vertical shaft of 2 m diameter	:	Rands	1 260 924.00	sum	Refer to shaft calculator	R 1 260 924.00	R 1 260 924.00
F1.2	Sealing of vertical shaft of 2.5 m diameter	:	Rands	1 441 056.00	sum		R 1 441 056.00	R 1 441 056.00
F1.3	Sealing of vertical shaft of 3.5 m diameter	:	Rands	1 843 704.00	sum		R 1 843 704.00	R 1 843 704.00
F1.4	Sealing of vertical shaft of 5 m diameter	:	Rands	2 564 232.00	sum		R 2 564 232.00	R 2 564 232.00
F1.5	Sealing of vertical shaft of 5.5 m diameter	:	Rands	2 797 344.00	sum		R 2 797 344.00	R 2 797 344.00
F1.6	Sealing of vertical shaft of 7 m diameter	:	Rands	3 655 620.00	sum		R 3 655 620.00	R 3 655 620.00
F1.7	Sealing of vertical shaft of 8 m diameter	:	Rands	4 259 592.00	sum		R 4 259 592.00	R 4 259 592.00
F1.8	Sealing of vertical shaft of 10 m diameter	:	Rands	5 605 284.00	sum		R 5 605 284.00	R 5 605 284.00
F1.9	Sealing of vertical shaft of 12.5 m diameter	:	Rands	7 470 180.00			R 7 470 180.00	R 7 470 180.00
F1.10	Incline shaft reinforced plug (3.5mx5m dimension)	:	Rands	273 423.90	sum	For 3.5x5m dimension, includes venting, excludes portal filling	R 273 423.90	R 273 423.90
F1.11	Incline shaft reinforced plug (3.5mx8m dimension)	:	Rands	437 478.24	sum	For 3.5x8m dimension, includes venting, excludes portal filling	R 437 478.24	R 437 478.24
F1.12	Adits (1.5x1.5)	:	Rands	35 154.50	sum	Routine adits of 1.5mx1.5m derived from incline shaft plug rate	R 35 154.50	R 35 154.50
F2	**Removal of dam liners and plugging and sealing of penstock**							
F2.1	Single HDPE liner	:	Rands	4.77	/m^2	Removal and disposal of single HDPE liner	R 4.77	R 4.77
F2.2	Three HDPE liners	:	Rands	7.15	/m^2	Removal and disposal of three HDPE liners	R 7.15	R 7.15
F2.3	Plug outlet and seal penstock of tailings dam	:	Rands	79 470.00	sum		R 79 470.00	R 79 470.00
G	**Rehabilitation of disturbed areas**							
G1	**Profiling**							
G1.1	Shaping/levelling of infrastructural footprint areas (500 mm)	:	Rands	77 152.13	/ha	Includes stockpiling of material, backfilling of excavations in cut to fill operation and final profiling, at an average depth of 500 mm over footprint area. Included an allowance of 25% extra over for negotiating remaining foundations, Excavations etc.	R 77 152.13	R 77 152.13
G1.2	Shaping/levelling of infrastructural footprint areas (750 mm)	:	Rands	115 728.19	/ha	Includes stockpiling of material, backfilling of excavations in cut to fill operation and final profiling, at an average depth of 750 mm over footprint area. Included an allowance of 25% extra over for negotiating remaining foundations, Excavations etc.	R 115 728.19	R 115 728.19
G1.3	Reshaping / profiling of dumps (general)	:	Rands	186 097.18	/ha		R 186 097.18	R 186 097.18
G1.4	Import cover material and spread (300 mm)	:	Rands	130 097.26	/ha	3000 m3 over 2 km average @ R Rands/m3	R 130 097.26	R 130 097.26
G1.5	Import cover material and spread (500 mm)	:	Rands	216 828.77	/ha	5000 m3 over 2 km average @ R Rands/m3	R 216 828.77	R 216 828.77
G1.6	Shaping and levelling of cover material **(Doze over)**	:	Rands	11.35	/m^3	Including quality control in terms of leveling (60% of routine dozing rate)	R 11.35	R 11.35
G1.7	Profiling of general disturbed areas (excluding infrastructural footprint areas)	:	Rands	1 916.08	/ha	Minimal dozing to enhance site drainage - no backfilling of excavations etc.	R 1 916.08	R 1 916.08
G1.8	Breach dam wall and reshape to 1:5	:	Rands	749.40	/m	Dam wall of approx. 5 m high with existing side slopes 1:3	R 749.40	R 749.40
G2	**Vegetation**							
G2.1	Establishment of vegetation (general)	:	Rands	33 820.08	/ha	Grasses on flat areas - hand seeding	R 33 820.08	R 33 820.08
G2.2	Establishment of vegetation on dumps	:	Rands	43 671.39	/ha	Grasses on slopes and upper surfaces - hand seeding	R 43 671.39	R 43 671.39
G2.3	Establishment of vegetation (Natural grassland)	:	Rands	8 598.63	/ha	Vegetation established from the seedbed harvested from the surrounding undisturbed grasslands areas. Include auger harvesting, seeding and labour. Excluding any fertilisation and soil amelioration	R 8 598.63	R 8 598.63
G2.4	Establishment of woody / thorny species	:	Rands	17 169.49	/ha	100 trees per ha @ R80 per tree X2 for labour and establishment	R 17 169.49	R 17 169.49
G2.5	Establishment of wetland vegetation (vegetation plugs)	:	Rands	190 728.00	/ha	Establish vegetation plugs with hydroscopic gel along scarified strips 500 mm apart in organic silt trap cells. @ R 36 /m2	R 190 728.00	R 190 728.00
G2.6	Removal of exotic/alien vegetation/small trees (<10ha)	:	Rands	6 399.89	/ha	For small areas <10ha	R 6 399.89	R 6 399.89
G2.7	Removal of exotic/alien vegetation/small trees (>100ha)	:	Rands	3 509.00	/ha	For substantial areas >100ha	R 3 509.00	R 3 509.00
G2.8	Removal of individual trees	:	Rands	45.81	/no		R 45.81	R 45.81
G2.9	Hydroseeding	:	Rands	22 805.40	/ha	Seeding slurry (artificial seed and compost mix) is transported in a tank, either truck mounted and sprayed over prepared surface. @ R 3.70 /m2	R 22 805.40	R 22 805.40
G2.10	Stabilize pH levels of soil with good quality lime	:	Rands	6 227.86	/ha	3-4ton/ha. Includes purchase, transport, handling and spreading. Nvirobuild	R 6 227.86	R 6 227.86
G2.11	Stabilize pH levels of soil with industrial lime	:	Rands	10 384.08	/ha	35ton/ha. Includes purchase, transport, handling and spreading.	R 10 384.08	R 10 384.08
G2.12	Establish tree stations	:	Rands	94 563.58	/ha	Excavation 1.5m X 1.5m X 1.5m = 3.375m3. Including excavation rate R32.60 X 2. Assume 5 trees per station @ R150 per tree. Additional 15% of labour + fertilisers. 80 tree stations per ha	R 94 563.58	R 94 563.58
G3	**Water management (pans, riparian areas, re-instatement of drainage lines)**							
G3.1	Reinstatement of drainage lines	:	Rands	5 786.41	/ha	Using a drainage density of 0.2 on average (Pittman et al.), average drainage corridor depth of 250 mm, general shaping and levelling rate but excludes 25% extra over	R 5 786.41	R 5 786.41
G3.2	Routing of storm water along dump toe	:	Rands	286.09	/m		R 286.09	R 286.09
G3.3	Reinstatement of wetlands	:	Rands	799 939.67	/ha	Please refer to wetland calculator	R 799 939.67	R 799 939.67
G3.4	**Boreholes**							
G3.4.1	Drilling of general boreholes (< 35m)	:	Rands	58 052.84	/unit	The rate includes site establishment and related costs, labour and PVC casing	R 58 052.84	R 58 052.84
G3.5	Equipping of scavenger borehole (Pump, electrical and piping)	:	Rands	52 980.00	/unit	Nominal allowance	R 52 980.00	R 52 980.00
G3.6	Pumping of water	:	Rands	2.00	/m^3		R 2.00	R 2.00
G3.6	**Plug and seal of boreholes**							

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G3.6.1	Surface plug (5m)	Rands	7 113.57	sum	The rate includes site establishment and related costs, all plug material and labour.	R 7 113.57	R 7 113.57
G3.6.2	Full depth plug (35m)	Rands	17 010.67	sum	The rate includes site establishment and related costs, all plug material and labour.	R 17 010.67	R 17 010.67
G4	**Surface subsidence**						
G4.1	Placement of composite rock grid with geotextile	Rands	58.16	/m^2	10% added for stitching of overlaps	R 58.16	R 58.16
G4.2	Rehabilitation of sinkholes and subsided areas	Rands	470 089.90	/ha	Infilling and stabilisation of cracks. Assumed double rate of rip, general shaping & levelling, and vegetation. Assume 1 m3 of infill material would be required for every 100 m2 (3km haul distance)	R 470 089.90	R 470 089.90
G4.3	Placement of geotextile over surface	Rands	45.74	/m^2	A8 bidim material	R 45.74	R 45.74
G5	**Demolition waste handling and disposal**						
G5.1	Disposal of inert demolition waste at an appropriate disposal facility	Rands	115.79	/m^3	Excluding transport	R 115.79	R 115.79
G5.2	Disposal of hazardous waste (disposal to Holfontein)	Rands	1 318.39	/m^3	Excluding transport	R 1 318.39	R 1 318.39
H	**Earthworks**						
H1	**Excavation**						
H1.1	Minor excavation	Rands	35.37	/m^3	(< 10 000 m3). As per Fraser Alexander	R 35.37	R 35.37
H1.2	Bulk excavation	Rands	22.64	/m^3	(> 100 000 m3)	R 22.64	R 22.64
H1.3	Trench excavation	Rands	44.67	/m^3	Continuous trench excavation. As per Fraser Alexander	R 44.67	R 44.67
H1.4	Removal of gunited embankments	Rands	103.68	/m^2	Excludes disposal. As per Fraser Alexander	R 103.68	R 103.68
H1.5	Clean-up of contaminated materials/soils	Rands	47.14	/m^3	Excavation only, load and haul and disposal to be determined separately. As per Fraser Alexander	R 47.14	R 47.14
H1.6	Dragline	Rands	5.20	/m^3		R 5.20	R 5.20
H2	**Materials transport**						
H2.1	**General load and haul**						
H2.1.1	Load and haul (1km haul)	Rands	33.95	/m^3	Small volumes on site (< 10 000 m3). As per Fraser Alexander	R 33.95	R 33.95
H2.1.2	Load and haul (2 km haul)	Rands	43.46	/m^3	Small volumes on site (< 10 000 m3). As per Fraser Alexander	R 43.46	R 43.46
H2.1.3	Load, haul (1- 2 km free haul) and spread over	Rands	39.66	/m^3	Including flattening/dozing of material. As per Fraser Alexander	R 39.66	R 39.66
H2.1.4	Extra over rates for overhaul beyond free haul distance	Rands	6.63	/m^3	Small volumes on site (< 10 000 m3). As per Fraser Alexander	R 6.63	R 6.63
H2.2	**Bulk load and haul (restricted to 5km)**						
H2.2.1	0 - 1km (CAT 777)	Rands	28.41	/m^3	Bulk volumes (> 50 000 m3)	R 28.41	R 28.41
H2.2.2	1 - 2km (CAT 777)	Rands	30.24	/m^3	Bulk volumes (> 50 000 m3)	R 30.24	R 30.24
H2.2.3	2 - 3km (CAT 777)	Rands	32.19	/m^3	Bulk volumes (> 50 000 m3)	R 32.19	R 32.19
H2.2.4	3 - 4km (CAT 777)	Rands	35.34	/m^3	Bulk volumes (> 50 000 m3)	R 35.34	R 35.34
H2.2.5	4 - 5km (CAT 777)	Rands	36.81	/m^3	Bulk volumes (> 50 000 m3)	R 36.81	R 36.81
H3	**Ripping**						
H3.1	General ripping	Rands	5 078.76	/ha	D 7 dozer - 3 ripper tines to depth of 500 mm. As per Fraser Alexander	R 5 078.76	R 5 078.76
H3.2	Deep ripping (heavy)	Rands	17 457.11	/ha	D 9 dozer - 1 ripper tine to depth of 1 m. As per Fraser Alexander	R 17 457.11	R 17 457.11
H3.3	Ripping for alleviation of compaction	Rands	3 464.41	/ha	D 6 dozer - 3 ripper tines to depth of 500 mm. As per Fraser Alexander	R 3 464.41	R 3 464.41
H3.4	Scarify upper surface of dumps	Rands	2 969.41	/ha	4X4 Tractor for vegetation preparation . As per Fraser Alexander	R 2 969.41	R 2 969.41
H4	**Dozing rates**						
H4.1	Flat dozing for profiling	Rands	18.92	/m^3	Small volumes, cut to fill including final profiling- Dozing of loose material D6/7. As per Frase	R 18.92	R 18.92
H4.2	Down dozing of material	Rands	14.90	/m^3	Small volumes - no profiling – Dozing of loose material D6/7. As per Fraser Alexander	R 14.90	R 14.90
H4.3	Flat dozing for profiling	Rands	12.92	/m^3	Large volumes - levelling and dozing of loose material / D10/D11. As per Kotze Construction	R 12.92	R 12.92
H4.4	Down dozing of material	Rands	9.87	/m^3	Large volumes - levelling and dozing of loose material	R 9.87	R 9.87
H5	**General earthworks**						
H5.1	Compaction	Rands	27.38	/m^3	Compaction in layers of 250 mm thickness. As per Fraser Alexander	R 27.38	R 27.38
H5.3	Blasting	Rands	19.07	/m^3		R 19.07	R 19.07
I	**Fencing**						
I1	**Erect fence**						
I1.1	Security fencing	Rands	167.51	/m		R 167.51	R 167.51
I1.2	Stock fencing	Rands	33.50	/m		R 33.50	R 33.50
I1.3	Concrete palisade	Rands	1 000.00	/m		R 1 000.00	R 1 000.00
I2	**Dismantle fence**						
I2.1	Security fencing	Rands	42.40	/m	Include in inert demolition	R 42.40	R 42.40
I2.2	Stock fencing	Rands	13.40	/m	Include in inert demolition	R 13.40	R 13.40
I2.3	Concrete palisade	Rands	147.40	/m	Include in inert demolition	R 147.40	R 147.40
J	**Post-closure aspects**						
J1	Rehabilitation monitoring	Rands	2 322.63	ha/5yrs	For 5 years	R 2 322.63	R 2 322.63
J2	Care and maintenance - high intensity	Rands	34 045.00	ha/5yrs	Rate is /ha/year. Assume worker hourly rate of R33/h, 240hr(6 weeks)/worker/year x 20 workers. 2 tractor an trailer for 30 days @ R 4 500/day. Additional allowance of 50% for	R 34 045.00	R 34 045.00
J3	Care and maintenance - low intensity	Rands	12 830.00	ha/5yrs	Rate is /ha/year. Assume worker hourly rate of R33/h, 80hr(2 weeks)/worker/year x 10 workers. One tractor an trailer for 30 days @ R 4 500/day. Additional allowance of 50% for supervision, general transport and other expenses	R 12 830.00	R 12 830.00
J4	Care and maintenance - to sustain grass cover vitality	Rands	7 340.00	ha/5yrs	Cutting @ R680/ha, baling@ R600/ha, plus transport by tractor average 5 km@R21/km. (note: rate to be applied @ 3 year intervals)	R 7 340.00	R 7 340.00
K	**Post-closure monitoring (Site Specific)**				**Refer to project information tab for calculation**		
K1	Initial surface water	Rands	342 078.00	/yr	Duration and intervals are indicated as per calculation and line item description	R 342 078.00	R 342 078.00
K2	Initial groundwater	Rands	165 994.40	/yr	Duration and intervals are indicated as per calculation and line item description	R 165 994.40	R 165 994.40
L	**Other**						
L1	Not applicable	Rands	-	N/A		R 0.00	R 0.00
L2	Sum allowance	Rands	-	/sum	Only to be used for post-closure aspects and additional allowances	R 0.00	R 0.00
M	**Site Specific**				**Refer to project information tab for calculation**		
M1	Load and Haul - 1 km	Rands	33.95	/m^3	Site specific Small Volume load and haul distance 1 km, Refer to project information tab for the calculation	R 33.95	R 33.95
M2	Load and Haul - 2 km	Rands	40.58	/m^3	Site specific Small Volume load and haul distance 2 km, Refer to project information tab for the calculation.	R 40.58	R 40.58
M3	Load and Haul - 3 km	Rands	47.21	/m^3	Site specific Small Volume load and haul distance 3 km, Refer to project information tab for the calculation.	R 47.21	R 47.21
M4	Load and Haul - 4 km	Rands	53.84	/m^3	Site specific Small Volume load and haul distance 4 km, Refer to project information tab for the calculation	R 53.84	R 53.84
M5	Load and Haul - 5 km	Rands	60.48	/m^3	Site specific Small Volume load and haul distance 5 km, Refer to project information tab for the calculation	R 60.48	R 60.48
M6	Load and Haul - 10 km	Rands	93.63	/m^3	Site specific Small Volume load and haul distance 10 km, Refer to project information tab for the calculation	R 93.63	R 93.63
M7	Load and Haul - 15 km	Rands	126.79	/m^3	Site specific Small Volume load and haul distance 15 km, Refer to project information tab for the calculation	R 126.79	R 126.79
M8	Load and Haul - 20 km	Rands	159.95	/m^3	Site specific Small Volume load and haul distance 20 km, Refer to project information tab for the calculation	R 159.95	R 159.95
M9	Load and Haul - 95 km	Rands	657.30	/m^3	Site specific Small Volume load and haul distance 95 km, Refer to project information tab for the calculation	R 657.30	R 657.30
M10	Load and Haul - 130 km	Rands	889.40	/m^3	Site specific Small Volume load and haul distance 130 km, Refer to project information tab for the calculation	R 889.40	R 889.40
N	**Site Specific**				**Refer to project information tab for calculation**		
N1	Removal of Transformer	Rands	38 001.24	sum	Cost includes removal and safe disposal of possible PCB's	R 38 001.24	R 38 001.24
N2	Construction of decontamination bay	Rands	567 628.64	sum	Assume 1000 m² in-situ concrete surface of 150 mm thick, at R 2 660/m³ plus 25% for sumps, etc. 10% added to the original rate of R2600 for escalation	R 567 628.64	R 567 628.64
N3	Establishment of a salvaging yard	Rands	220 394.10	sum	Assume 5000 m² salvage yard of 50m x 100m, with imported aggregate surface 150 mm at R 195/m³ including in-situ material compaction , plus 300m security fencing @ R 158/m.	R 220 394.10	R 220 394.10
N4	Radiation scan	Rands	400 000.00	sum	Cost for an average plant site radiation scan as derived from serveral recent quotations	R 400 000.00	R 400 000.00

UNIT RATES FOR DEMOLITION, EARTHWORKS, REHABILITATION AND RELATED WORK, as at December 2018							December 2018
Ref nr		Currency	Unit Rate	Unit	Comment	Base rate	1.0000
N5	Contaminated land assessment for Shaft area (excl. implementation of measures)	Rands	75 000.00	sum	Moderately to heavy/large contaminated plant sites (30% footprint contamination to depth of 500 mm) Includes site visit, sampling at 20 sites, organic and inorganic as well as soluble analysis, data analysis, source-pathway-receptor concept model and reporting	R 75 000.00	R 75 000.00
N6	Contaminated land assessment for Uranium plant (excl. implementation of measures)	Rands	75 000.00	sum	Small/less contaminated plant sites (i.e. 10% footprint contamination to depth of 250 mm). Includes site visit, sampling at 10 sites, organic and inorganic as well as soluble analysis, data analysis and reporting	R 75 000.00	R 75 000.00
N7	Integrated specialist study to identify and scope surface contamination, surface and groundwater remediation and management requirements	Rands	250 000.00	sum	Sum allowance based on various communications with Sibanye in 2018 and projected budget allocations for 2019	R 250 000.00	R 250 000.00
N8	Spillway for upper surface routing	Rands	408.00	/m²	Armoflex 180.Armorflex units to be installed and wired using 3.1 mm galvanised fencing wire and anchored on steep slopes using steel pegs through top cable loops. Supply and install Bidim A8 or similar to prevent scouring below the rock lined drain and berm inlets.Bidim to extend to the berm inlets. Addtional 10% for reinforcement and minimal earthworks.	R 408.00	R 408.00
N9	Stabilize PH levels of soil with lime	Rands	1 047.47	t		R 1 047.47	R 1 047.47
N10	Erect signage and painted drums indicating cyanide hazard	Rands	65 131.54	sum		R 65 131.54	R 65 131.54
N11	Ridge plowing and cross walls to curb dust impacts	Rands	95 091.98	/ha		R 95 091.98	R 95 091.98
N12	Care and maintenance (Extensive High intensity)	Rands	51 067.50	/ha	5 years. Disturbed areas from which infrastructure has been removed, ash dam, sand mines. Allowed for 50% premium for TSF that are in a holding pattern.	R 51 067.50	R 51 067.50
N13	Conduct waste assessment to determine whether sludge is hazardous	Rands	150 000.00	/ha	Nominal allowance for waste assessment on mud ponds	R 150 000.00	R 150 000.00
N14	Milling through the Ezulwini plant	Rands	170.34	/ha	Nominal allowance for processing mud pond sludge in processing plant, as supplied by the mine	R 170.34	R 170.34
N15	Radiation scan after removal of sludge	Rands	91 306.00	/ha		R 91 306.00	R 91 306.00
	Shafts (Headgear calculator)						
N16	Headgear concrete "concrete outer shell"	Rands	937 366.61	sum		R 937 366.61	R 937 366.61
N17	Headgear "inner steel superstructure"	Rands	513 043.70	sum		R 513 043.70	R 513 043.70
N18	Headgear - Dismantling and lowering of headgear equipment	Rands	158 300.46	sum		R 158 300.46	R 158 300.46
N19	Removal of heavy equipment - Winder house	Rands	703 318.79	sum		R 703 318.79	R 703 318.79
N20	Headgear Steel "steel superstructure"	Rands	289 053.37	sum		R 289 053.37	R 289 053.37
N21	Headgear (plinths)	Rands	53 427.24	sum		R 53 427.24	R 53 427.24
N22	Headgear - Dismantling and lowering of headgear equipment	Rands	128 614.92	sum		R 128 614.92	R 128 614.92
N23	Removal of heavy equipment - Winder house	Rands	487 527.80	sum		R 487 527.80	R 487 527.80
N24	Routing of storm water along outer slopes/upper surface	Rands	2 945.47	/ha		R 2 945.47	R 2 945.47
N25	TSF geochemical characterisation	Rands	250 000.00	sum		R 250 000.00	R 250 000.00
N26	Engineering cover designs and landform profiling designs for all in-situ rehabilitated TSFs	Rands	350 000.00	sum		R 350 000.00	R 350 000.00
N27	Leeuspruit rehabilitation	Rands	10 000 000.00	sum		R 10 000 000.00	R 10 000 000.00
N28	Infrastructure third-party transfer feasibility pilot study based on Ezulwini housing units and associated infrastructure	Rands	350 000.00	sum		R 350 000.00	R 350 000.00
N29	Vegetation establishment on TSF beach	Rands	105 460.85	/ha	Dryland rate sourced from Agreenco for 2015, escalated by CPI to 2018	R 105 460.85	R 105 460.85
N30	Slope preparation of TSF side slopes (southern and eastern slopes)	Rands	9 873.00	/ha	Rate sourced from Agreenco (September 2018)	R 9 873.00	R 9 873.00
N31	Vegetation establishment directly on TSF side slopes (southern and eastern slopes)	Rands	283 131.84	/ha	Rate sourced from Agreenco (September 2018)	R 283 131.84	R 283 131.84
N32	Installation of leaching equipment	Rands	50 047.06	/ha	Rate sourced from Agreenco (September 2018)	R 50 047.06	R 50 047.06
N33	Leaching of side slopes for 18 months	Rands	12.50	KL	Rate sourced from Agreenco (September 2018)	R 12.50	R 12.50
N34	Post-decant groundwater quality monitoring	Rands	33 198.88	/yr	Post-decant groundwater quality monitoring at 3 locations (upstream-, at- and downstream of Gemsbokspruit decant point)	R 33 198.88	R 33 198.88
N35	Post-decant surface water quality and sediment radioactivity monitoring	Rands	171 039.00	/yr	Post-decant groundwater quality monitoring at 3 locations (upstream-, at- and downstream of Gemsbokspruit decant point), as well as sampling of and NECSA laboratory analysis of Kleinwes Rietspruit sediment, for potential mobilisation of radioactivity in sediments	R 171 039.00	R 171 039.00
N36	Potential emergency halting of re-watering	Rands	60 950 000.00	sum	Allows for installation of 2 x ANDRITZ dewatering pumps, pipelines, associated equipment and ancillary support work. Costs escalated by 12% (9% for 2 yrs and additional 3% for ancillary support work), from estimate received from Sibanye dated 2016.	R 60 950 000.00	R 60 950 000.00
N37	Possible re-watering sinkhole rehabilitation costs	Rands	7 060 000.00	sum	Allowance to repair potential post-rewatering damage to open land, highways, railway lines and residences. Costs escalated by 5%, from estimate received from Jones & Wagener dated 2017.	R 7 060 000.00	R 7 060 000.00
N38	Structures cracking photographic assessment	Rands	15 000.00	sum	Conduct photographic survey of existing cracking for all existing surrounding structures prior to rewatering	R 15 000.00	R 15 000.00
N39	Sinkole and subsidence LIDAR monitoring	Rands	2 750 000.00	sum	Conduct 10 cm LIDAR subsidence monitoring of Ezulwini underground workings area annually for a period of 10 years after rewatering commences. Costs escalated by 5%, from estimate received from Jones & Wagener dated 2017.	R 2 750 000.00	R 2 750 000.00
N40	Possible relocation of existing 5ML Ezulwini WTP	Rands	8 000 000.00	sum	Estimated costs to relocated the existing Ezulwini 5ML water treatment plant to the Gemsbokspruit eye decant point, should poor quality water decant. Estimate supplied by Sibanye dated 2019	R 8 000 000.00	R 8 000 000.00
N41	wetlands, biomonitoring and aquatics monitoring)	Rands	126 000.00	/yr	Wetlands, biomonitoring and aquatics monitoring as per EMPr, incorporating all relevant monitoring plans (monthy SW quality for 10 years, biannual biomonitoring for 3 years and annual PES,EIS and Ecosystem Services for 3 years on Leeuspruit & KleinWes, but for 10 years on Wonderfonteinspruit). Costs escalated by 5%, from estimate received from Jones & Wagener dated 2017.	R 126 000.00	R 126 000.00

APPENDIX C

Document limitations

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