

**Kudumane Manganese Resources (Pty) Ltd:
Kudumane Manganese Mine (Hotazel, Devon and
Kipling)**

**Closure Liability Report for the KMR
Expansion Project**

Report date: 9/3/2021
DMRE Reference: NC 30/5/1/2/2/10053 MR
Report Reference: SRK-KUD-21-05-04



Stewards



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CLOSURE LIABILITY UPDATE REPORT 2021

COMPILED IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT (ACT NO 28 OF 2002) AND THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998) REGULATIONS PERTAINING TO THE FINANCIAL PROVISION FOR PROSPECTING, EXPLORATION, MINING OR PRODUCTION OPERATIONS (GN. NO. R. 1147, 20 NOVEMBER 2015)

Mine Name	Kudumane Manganese Resources (Pty) Ltd: Kudumane Manganese Mine (Hotazel, Devon and Kipling)
Location	Hotazel, Northern Cape
Project	Closure liability calculation for the KMR expansion project
Document	Draft Closure liability report for the KMR expansion project
Project Number	SRK-KUD-21-05-04
DMRE Reference No	NC 30/5/1/2/2/10053 MR
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Date	September 2021

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SHANGONI
Management Services (Pty) Ltd

Executive summary

Project context:

Shangoni Management Services (Pty) Ltd (“Shangoni”) was appointed by SRK Consulting (South Africa) (Pty) Ltd. to calculate the closure liability associated with the expansion activities planned for Kudumane Manganese Resources (“KMR”) expansion project located in Hotazel, Northern Cape. The purpose of this document is to provide the closure liability calculation for the proposed activities as required by the National Environmental Management Act, 1998 (Act 107 of 1998) (“NEMA”) and the Mineral and Petroleum Resource Development Act, (Act 28 of 2002) (“MPRDA”).

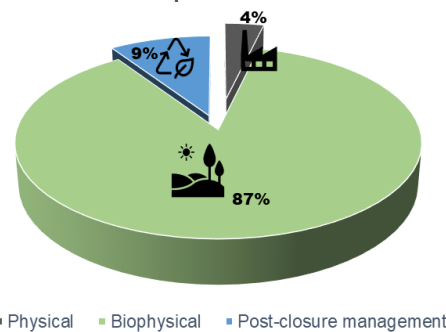
Summarised updated liability (Combined for all three operations):

Item	Total
Physical	R1 141 994,63
Biophysical	R27 198 229,04
Post-closure management	R2 916 973,68
Sub-Total 1	R31 257 197,35
Preliminary & General (12%)	R3 750 863,68
Weighing factor 2	R3 938 406,87
Contingency (10%)	R3 125 719,74
Sub-Total 2 (including P&G cost and excluding VAT)	R38 321 323,95

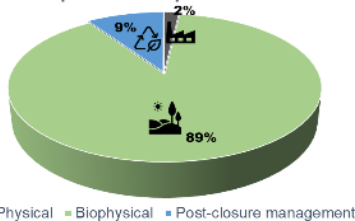
Summary – all operations:

The combined closure liability for the expansion activities associated with the Hotazel, Devon and Kipling operations is R38 321 323 (Excl. VAT). The liability is made up of three main components namely physical (demolition/removal of infrastructure), biophysical (rehabilitation of disturbed areas) and post-closure management (monitoring and maintenance). The largest portion of the liability (87%) lies with the biophysical cost component, i.e., rehabilitation of processing waste deposits (waste rock dumps), rehabilitation of opencast pits and general surface rehabilitation.

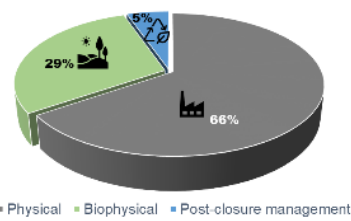
Cost per main component - All operations



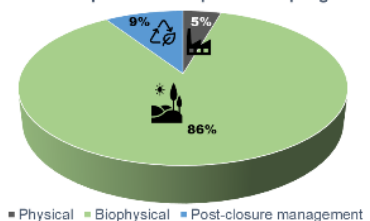
Cost per main component - Hotazel



Cost per main component - Devon



Cost per main component - Kipling



Summary – Hotazel:

The closure liability for the expansion activities associated with the Hotazel operation is R19 036 266,44 (Excl. VAT). The expansion entails the extension of the pit, waste rock dump footprints and the construction of additional infrastructure.

Summary – Devon:

The closure liability for the expansion activities associated with the Devon operation is R302 818,36 (Excl. VAT). The expansion entails the construction of explosives magazine on the Devon farm.

Summary – Kipling:

The closure liability for the expansion activities associated with the Kipling operation is R18 982 239,16 (Excl. VAT). Kipling operation entails the establishment of mining activities (pit, WRD and infrastructure).

Residual and latent risks liability:

The residual and latent risk liability cannot be determined as there is insufficient specialist information supporting residual and latent risks identification and quantification.



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References

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Definitions

Term	Explanation
Concurrent rehabilitation	Rehabilitation that occurs during the process of mining as the ore body is mined out in parts of a mine.
Environment	The surroundings (biophysical, social and economic) within which humans exist and that are made up of: <ul style="list-style-type: none"> • the land, water and atmosphere of the earth; • micro-organisms, plant and animal life; • any part or combination of (i) and (ii) and the interrelationships among and between them; and • the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.
Environmental Impacts	Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's activities, products or services.
Financial Provision	The insurance, bank guarantee, trust fund or cash that applicants for an environmental authorisation must provide in terms of this Act guaranteeing the availability of sufficient funds to undertake the- <ol style="list-style-type: none"> (a) rehabilitation of the adverse environmental impacts of the listed or specified activities; (b) rehabilitation of the impacts of the prospecting, exploration, mining or production activities, including the pumping and treatment of polluted or extraneous water; (c) decommissioning and closure of the operations; (d) remediation of latent or residual environmental impacts which become known in the future; (e) removal of building structures and other objects; or (f) remediation of any other negative environmental impacts.
Land use	The various ways in which land may be employed or occupied. Planners compile, classify, study and analyse land use data for many purposes, including the identification of trends, the forecasting of space and infrastructure requirements, the provision of adequate land area for necessary types of land use, and the development or revision of comprehensive plans and land use regulations.
Rehabilitation	The process of reshaping and re-vegetating land to restore it to a stable condition with a land-use that is appropriate for the particular location and is not associated with any pollution issues such as water pollution.
Topography	Topography, a term in geography, refers to the "lay of the land" or the physio-geographic characteristics of land in terms of elevation, slope and orientation.
Vegetation	All of the plants growing in and characterising a specific area or region; the combination of different plant communities found there.
Waste	As per the definition of the National Environmental Management: Waste Amendment Act, 2014 – means <ol style="list-style-type: none"> (a) any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can



Term	Explanation
	<p>be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 to the Act; or</p> <p>(b) any other substance, material or object that is not included in Schedule 3 that may be defined as a waste by the Minister by notice in the Gazette, but any waste or portion of waste, referred to in paragraphs (a) and (b), ceases to be a waste:</p> <p>(i) once an application for its re-use, recycling or recovery has been approved or, after such approval, once it is, or has been re-used, recycled or recovered;</p> <p>(ii) where approval is not required, once a waste is, or has been re-used, recycled or recovered;</p> <p>(iii) where the Minister has, in terms of section 74, exempted any waste or a portion of waste generated by a particular process from the definition of waste; or</p> <p>(iv) where the Minister has, in the prescribed manner, excluded any waste stream or a portion of a waste stream from the definition of waste.</p>

Abbreviations

AML	-	Asia Minerals Limited
BoQ	-	Bill of Quantities
DMRE	-	Department of Mineral Resources and Energy
EIA/EMPr	-	Environmental Impact Assessment and Environmental Management Programme report
I&APs	-	Interested and Affected parties
KMM	-	Kudumane Manganese Mine
KMR	-	Kudumane Manganese Resources
LOM	-	Life of Mine
MPRDA	-	Mineral and Petroleum Resource Development Act
NEMA	-	National Environmental Management Act
NCMC	-	Northern Cape Manganese Company
WML	-	Waste Management Licence
WRD	-	Waste rock dump
WULA	-	Water Use Licence application



1. Introduction

1.1. Appointed reviewer

Table 1: Appointed reviewer & experience

Name of firm	Shangoni Management Services
Postal address	P.O. Box 74726 Lynnwood Ridge 0040
Telephone No.	(012) 807 7036
Fax	(012) 807 1014
E-mail	anika@shangoni.co.za

Team of Environmental Assessment Practitioners on project

Name	Qualification	Responsibility
Brian Hayes	Professional Engineer	Quality Assurance
Emma Fourie	B.Sc. (Hons) Environmental Management (NWU)	Product Owner
Anika van Vuuren	B.Sc. (Hons) Environmental Management (NWU)	Project Lead

Detailed CVs for the project team are appended (Appendix C).

1.2. Mine details

Table 2: Mine / Client details

Aspect	Description
Client name	SRK Consulting (South Africa) (Pty) Ltd. (on behalf of KMR)
Company name	Kudumane Manganese Resources (Pty) Ltd
Name of Mine	Kudumane Manganese Mine
DMRE Ref. No.	NC 30/5/1/2/2/10053 MR
Responsible Person	Tshifhiwa Nemakhavhani
Physical address	328 Rivonia Boulevard, 1st Floor North Wing, Rivonia, 2128
Postal address	P.O. Box 1010, Houghton, 2041
Telephone	011 880 2771
E-mail	Tshifhiwa.Nemakhavhani@kmr.co.za



1.3. Project background

Shangoni Management Services (Pty) Ltd (“Shangoni”) was appointed by SRK Consulting South Africa (Pty) Ltd (“SRK”) to calculate the closure liability associated with the expansion activities planned for Kudumane Manganese Resources mine (“KMR”), located in Hotazel, Northern Cape.

The purpose of this document is to supply the Department of Mineral Resources and Energy (“DMRE”) with the closure liability estimate for the proposed activities, as required by the National Environmental Management Act, 1998 (Act 107 of 1998) (“NEMA”) and the Mineral and Petroleum Resource Development Act, (Act 28 of 20025) (“MPRDA”). The contents of this financial provisioning report are based on the requirements as stipulated under Government Notice Regulations 1147.

2. Legislation and guidelines applicable

2.1. NEMA, 1998 (Act No. 107 of 1998)

Section 24P (1) of NEMA requires that *“An applicant for an environmental authorisation relating to prospecting, exploration, mining or production must, before the Minister responsible for mineral resources issues the environmental authorisation, comply with the prescribed financial provision for the rehabilitation, closure and ongoing post decommissioning management of negative environmental impacts”*.

The Financial Provisioning Regulations, 2015 was published in GN R1147 in GG 39425 of 20 November 2015, as amended. In terms of regulation 2, *“the purpose of these regulations is to regulate the determination and making of financial provision for the costs associated with the undertaking of management, rehabilitation and remediation of environmental impacts from prospecting, exploration, mining or production operations through the lifespan of such operations and latent or residual impacts that may become known in the future.”* There is an extended transitional period of 39 months after the commencement of these Regulations for alignment of the review, assessment and adjustment of financial provision, as well as the submission of certain documentation, with these regulations.

On 22 April 2021, the Minister of Forestry, Fisheries and Environment published a notice of her intention to amend the transitional arrangements contained in the Financial Provisioning Regulations, 2015, (as amended), published in terms of the NEMA. The proposed amendment extends the deadline for compliance to the Financial Provision Regulations to 19 June 2022.

In terms of regulation 6 of the Financial Provisioning Regulations, 2015, *“An applicant must determine the financial provision through a detailed itemisation of all activities and costs, calculated based on the actual costs of implementation of the measures required for-*

- a) *annual rehabilitation, as reflected in an annual rehabilitation plan;*
- b) *final rehabilitation, decommissioning and closure of the prospecting, exploration, mining or production operations at the end of the life of operations, as reflected in a final rehabilitation, decommissioning and mine closure plan; and*



- c) *remediation of latent or residual environmental impacts which may become known in the future, including the pumping and treatment of polluted or extraneous water, as reflected in an environmental risk assessment report.*"

2.2. The MPRDA (2002) (Act 28 of 2002) and regulations

The Mineral and Petroleum Resources Development Regulations as published in GN R527 in GG 26275 of 23 April 2004, as amended (MPRDR) are still in force and applicable to mine closure. The following principles in regulation 56 of the MPRDR govern mine closure:

"In accordance with applicable legislative requirements for mine closure, the holder of a prospecting right, mining right, retention permit or mining permit must ensure that -

- a) *the closure of a prospecting or mining operation incorporates a process which must start at the commencement of the operation and continue throughout the life of the operation;*
- b) *risks pertaining to environmental impacts must be quantified and managed pro-actively, which includes the gathering of relevant information throughout the life of a prospecting or mining operation; in accordance with the provisions of the National Environmental Management Act, 1998, the Financial Provision Regulations, 2015 and the Environmental Impact Assessment Regulations, 2014.*
- c) *the safety and health requirements in terms of the Mine Health and Safety Act, 1996 (Act No. 29 of 1996) are complied with;*
- d) *residual and possible latent environmental impacts are identified and quantified; in accordance with the provisions of the National Environmental Management Act, 1998, the Financial Provision Regulations, 2015 and the Environmental Impact Assessment Regulations, 2014.*
- e) *the land is rehabilitated, as far as is practicable, to its natural state, or to a predetermined and agreed standard or land use which conforms with the concept of sustainable development; in accordance with the provisions of the National Environmental Management Act, 1998, the Financial Provision Regulations, 2015 and the Environmental Impact Assessment Regulations, 2014; and*
- f) *prospecting or mining operations are closed efficiently and cost effectively."*

A closure certificate in terms of section 43 of the MPRDA is required as part of the closure process. In terms of section 43(4) of the MPRDA *"an application for a closure certificate must be made to the Regional Manager in whose region the land in question is situated within 180 days of the occurrence of the lapsing, abandonment, cancellation, cessation, relinquishment or completion contemplated in section 43(3) and must be accompanied by the required information, programmes, plans and reports prescribed in terms of this Act and the National Environmental Management Act, 1998."* The application for a closure certificate must be accompanied by the following documentation (in terms of regulation 57(2) of the MPRDR):

- a) *"A closure plan contemplated in regulation 62;*
- b) *an environmental risk report contemplated in regulation 60;*



- c) a final performance assessment report contemplated in the Environmental Impact Assessment Regulations, 2014; and
- d) a completed application form contemplated in regulation 58(1) to transfer environmental liabilities and responsibilities, if the transfer of such liabilities have been applied for.”

Section 43(5) of the MPRDA stipulates that “no closure certificate may be issued unless the Chief Inspector and each government department charged with the administration of any law which relates to any matter affecting the environment have confirmed in writing that the provisions pertaining to health and safety and management pollution to water resources, the pumping and treatment of extraneous water and compliance to the conditions of the environmental authorisation have been addressed.”

Environmental liabilities and responsibilities as identified in the environmental authorisation and the required closure plan may be transferred to a competent person by the Minister of Mineral Resources and Energy in terms of regulation 58 of the MPRDR.

3. Mine description and closure objectives

3.1. Mine description

KMR is a joint venture between two BBBEE companies, Dirleton Minerals & Energy and the Northern Cape Manganese Company (“NCMC”), that own equal shares in the firm. Hong Kong-based manganese multinational Asia Minerals Limited (“AML”) owns a 49% share in both companies and is the project’s technical partner.

KMR established a manganese mine, KMM, situated approximately 3 km south-west of the town Hotazel and 60 km north-west of Kuruman. KMM’s initial operations were undertaken on the farms Telele 312 and York 279 (DMRE reference No: NC 30/5/1/2/2/268 MR). KMR took a decision to expand its mining operations and applied for a mining right to include the farms Kipling 271, Devon 277 and Hotazel 280, to which this closure liability report applies. An Environmental Impact Assessment and Environmental Management Programme report (“EIA/EMPr”) compiled by SLR Consulting, 2014, supporting this application was submitted to the DMRE in September 2014 and the application was approved in January 2017 (DMRE reference No. NC 30/5/1/2/2/10053 MR). The Life of Mine of the operation is estimated at 6 years (SLR, 2014).

The current mining method followed is roll-over opencast mining with concurrent rehabilitation that will be the mining method of choice for the proposed opencast pit areas. As part of the roll-over opencast mining operations, waste rock and overburden will be used to backfill the pit in the same order as removed. Topsoil will then be placed over the backfilled void and vegetation will be re-established.

Mining activities at KMM can be summarised as follows:

- Devon Farm No. 277: Mining and removal of manganese ore from the historical pit. KMR has not undertaken any mining activities on the site to date. A conceptual rehabilitation and closure criteria for Devon pit and surrounding disturbed areas has been compiled (Shangoni, 2020). Sebilo



Resources (Pty) Ltd removed product stockpiles, BIF Dumps (1a, 1b and 1d), and fines stockpile belonging to third party;

- Hotazel Farm No. 280, remaining extent: Opencast mining was initiated in 2017. Haul roads, laydown areas, administrative / site management offices, waste rock stockpiles and topsoil stockpiles were established. The ore from Hotazel is transported to York for processing; and
- Kipling Farm No. 271: This farm has been included for the purposes of potential future mining operations. KMR is intending to commence with mining on this farm as part of the expansion project.

It is the intention of KMR to expand its existing operations and construct additional infrastructure to improve production capacity.

SRK Consulting (South Africa) (Pty) Ltd (“SRK”) was appointed by KMR to undertake an integrated environmental authorisation process for the proposed KMR expansion project in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) and National Water Act, 1998 (Act No. 36 of 1998) (NWA).

The infrastructure and activities associated with the proposed KMR expansion project require a new Environmental Authorisation, the amendment of the mine’s existing EMPs, a Waste Management Licence (“WML”) and a Water Use Licence application (“WULA”) to authorise the following key infrastructure:

- A new opencast pit mine on Kipling;
- Expansion of the Hotazel opencast pit to allow for the mining of KMRs boundary pillar associated with the pit; and
- An attenuation dam on the Ga-Mogara River, to allow for the expansion of the Hotazel pit.

The proposed expansion activities and infrastructure associated with KMR’s Mining Right (NC/30/5/1/2/2/10053 MR) are summarised in Table 3 in relation to the farms on which the proposed activities/infrastructure are planned for.

Table 3: KMR Expansion Project proposed activities

Property	Activities to be undertaken
Kipling 271	Development of: <ul style="list-style-type: none"> • New opencast pit operation; • Waste rock dump; • RoM stockpiles; • Haul road (approx. 1.2 km); • Sewerage treatment facility; • Potable water tank; • Administrative offices; • Change houses; • Diesel bay and fuel storage; • Waste storage facility; • Pollution control dam; • Construction and upgrading of access gravel road to Kipling offices; and



Property	Activities to be undertaken
	<ul style="list-style-type: none"> Powerlines and associated infrastructure.
Hotazel 280	<ul style="list-style-type: none"> Expansion of the Hotazel Pit (to allow for the mining of the boundary pillar); Relocation of administrative offices to be outside the blast zone; Development of: <ul style="list-style-type: none"> RoM stockpile; Waste Rock Dump North, South and East (next to the pit); Attenuation dam within the Ga-Mogara River; Potable water tank; Sewage treatment plant (Lilliput plant); and Truck parking area.
Devon 277	<ul style="list-style-type: none"> Establishment of an explosive magazine; Rehabilitation activities at the existing pit; and Establishment of monitoring boreholes.

The mine locality map, properties on which the mine is located, the master layout plan and detailed site plan containing current and planned disturbances are included in Appendix A of this report.

3.2. Closure objectives / commitments in EIAR/EMPr

The main closure objective for KMM, as defined in the EIAR/EMPr (Metago, 2010) is to return the project area to its pre-project state (pre-use land capability of natural / grazing land). In this regard, upon mine closure:

- No further mining activities will take place;
- The topography of the area will have been restored to its pre-project state (with the exception of the permanent mineralised waste facilities and possibly surface water management structures if required);
- Topsoil will have been replaced at disturbed areas; and
- Disturbed areas will have been re-vegetated.

In the event that water quality monitoring around any waste rock dumps indicates that the dumps are causing pollution, catchment paddocks and soakaways will be provided to minimise the risk of exposure to wildlife, livestock and humans. The waste rock dump ("WRD") facilities would remain as permanent landforms at closure. Rehabilitation will be undertaken to ensure that a productive land use can take place post-closure (even though it is unlikely to be at the same carrying capacity) as per the EIA/EMPr for Devon and Hotazel at KMM (SLR, 2014).

Where the decommissioning and operational phases overlap, operational facilities will be used in support of decommissioning activities until such time as these facilities are decommissioned. Once these facilities are decommissioned, the same temporary contractor's working areas used during the construction phase will be utilised.

Decommissioning and closure activities, as identified in the EIAR/EMPr (SLR, 2014) are listed below:

- Backfilling the open pits with waste rock material;



- Stabilising and profiling of permanent WRDs;
- Stabilising underground mine workings (existing mining rights area only);
- Dismantling and demolishing of infrastructure;
- Replacing topsoil resources on disturbed areas;
- Ensure that vegetation on rehabilitated areas is sustainable;
- Dismantling and rehabilitation of railway tracks and rehabilitation of roads (depending on end use);
- Rehabilitation of the disturbed areas where infrastructure has been removed by sloping, filling in excavations and re-vegetating where possible;
- The surface of the tailings dam will be covered with waste rock and/or vegetation (new mining rights area only);
- There will be a period of active after-care followed by a passive after-care phase;
- Maintenance of vegetation where this is used for rehabilitation;
- Maintenance of facilities such as fencing, fire breaks, access roads and ramps, overflow structures;
- Removal of any invasive species from the rehabilitated sites;
- Inspecting on an annual basis to repair any erosion gullies; and
- Monitoring of potential groundwater pollution plumes.

Rehabilitation success will be determined by monitoring trends in soil nutrient levels, soil microbial levels, vegetation cover and vegetation biodiversity levels and comparing data and temporal trends in the data to numerical targets. Rehabilitated areas will be monitored for a minimum period of five years, and managed where necessary to ensure the objective of restoring the land to its pre-mining land use capability. This issue will be revisited as part of the detailed closure planning for the project.

These closure objectives will need to consider a number of site-specific closure criteria in order to be incorporated and actioned within the final rehabilitation, decommissioning and mine closure plan. Proposed closure criteria have been defined in the closure and rehabilitation plan (Shangoni, 2021a)

3.3. End-land use

It is proposed in the mine closure plan (Shangoni, 2021a) that KMM will endeavour to rehabilitate the areas disturbed by mining activities to ensure that the areas are safe and stable and relate as close as possible to the state of the surrounding natural vegetation.

Currently, the most likely final land use is to use the area primarily for grazing and game farming. This proposed final land use must be discussed with the stakeholders (such as DMRE, local municipality, local communities, etc.) and agreed upon.

4. Costing assumptions

The following assumptions were made as part of the closure liability determination:

- All existing activities and infrastructure associated with the Hotazel and Devon farms that might overlap with the activities associated with this expansion project, were calculated in the existing



closure liability report (Shangoni, 2021). This report contains the liability associated with the proposed new or additional activities not already costed in the existing liability report.

- The compilation of the closure liability associated with the KMR expansion project is based on information (volumes/quantities) provided by the mine and SRK.
- No allowances are made for money received from sale of equipment, recyclable materials, structures, vehicles or the hiring out of infrastructure.
- It is assumed that not all the power lines will have to be removed, as it is anticipated that some of the power lines will be kept as a source of power supply for post-closure use.
- Concrete structures will be demolished and buried one metre below natural ground adjacent to their current positions as per DMRE guideline requirements.
- Boundary/perimeter fencing will not be removed and will remain post closure to support the end-land use.
- In order to allow for the mining of the boundary pillars associated with Hotazel pit, an in-stream attenuation dam will be constructed within the Ga-Mogara river. It is assumed that this attenuation dam will remain in place after the cessation of mining activities at Hotazel.
- It is assumed that all topsoil will be stored in the following manner to preserve the integrity of the topsoil:
 - Use a loader to dump the topsoil in windrow;
 - Allow to vegetate with indigenous vegetation; and
 - The windrows should be no higher than 3 m.
- General disturbed areas were included in the closure-cost calculation. These are areas that were disturbed by mining activities and should be rehabilitated in order to return them to their pre-mining state.
- Maintenance and aftercare (repairing erosion, ensuring vegetation is established and that water management structures are effective) were calculated for the entire area encompassing the proposed activities.
- A contingency of 10% is applied on the sub-total for physical and biophysical costs.
- Preliminary and general costs (P&Gs) of 12% are applied to the subtotals, as per DMRE guideline document.

5. Closure liability calculation

5.1. Process followed (methodology)

The following steps were taken to compile the environmental closure liability:

- The structures/disturbances were measured using designs, surveyor maps, aerial photos and other documents necessary to calculate the closure liability obtained from the mine and information was incorporated in the calculation spreadsheet;
- The assumptions were defined based on existing EIA/EMPr commitments; and



- Existing liabilities associated with the closure liability report compiled in April 2021 (Shangoni) were considered to avoid double costing.

The closure liability calculation consists of the following main categories:

- Physical - Demolition of infrastructure where infrastructure does not form part of end-land use;
- Biophysical - Actions to safeguard (making safe and stable) and re-establish the biophysical to ensure a sustainable landform and mitigate identified risks. This includes ripping disturbed areas and seeding some of the ripped areas (where vegetation could not establish naturally); and
- Post-closure management – Actions required as part of aftercare after the mine has been closed.

The following information (Table 4) serves as input into explaining the process followed to calculate the financial provision required.

Table 4: DMRE criteria applied in calculating the liability

Aspect	DMRE Guideline Reference	Input
Minerals mined / processed	Table B12	Manganese ore (oxide)
Primary risk class	-	Class B, medium risk
Environmental sensitivity	Table B4	Medium
Specialist studies required	Table B9	Screening level risk assessment
Preliminary and General	-	12% of sub-total 1 because sub-total 1 < R 100 000 000.00.
Contingency	-	10%
Weighing factor 1 – Nature of terrain	Table B7	Flat – 1.00
Weighing factor 2 – Proximity to urban area	Table B8	Peri-urban – 1.05 (Peri-urban: less than 150 km from a developed urban area)

5.2. Demolition and rehabilitation rates

The personnel within the DMRE Regional Offices are required to review and approve the quantum, that is, the monetary value of the financial provision that has been computed by the holder of a prospecting right, mining right or mining permit during the annual review as being sufficient to cover the environmental liability at that time and at closure of the mine.

A guideline document titled *Guideline document for the evaluation of financial provision made by the mining industry* has been developed to address this need and is for use by the DMRE personnel in the Regional Offices.

The guideline for the calculation of closure cost issued by DMRE in 2005 was used to support the calculation of the closure cost quanta. The tariffs used in the liability calculation were obtained from the DMRE on the 10th of May 2021. Table 5 contains the rates used for the 2021 closure liability calculation.



Table 5: Applicable DMRE rates used for quantum determination

Description		Unit	Rate
2a	Demolition of steel buildings and structures	m ²	R 238,71
2b	Demolition of reinforced concrete buildings and structures	m ²	R 351,79
3	Rehabilitation of access roads	m ²	R 42,72
5	Demolition of housing and/or administration facilities	m ²	R 477,42
6	Opencast rehabilitation including final voids and ramps	ha	R 242 984,15
8a	Rehabilitation of overburden and spoils	ha	R 166 847,44
8b	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	R 207 805,47
10	General surface rehabilitation	ha	R 132 171,31
11	River diversions	ha	R 132 171,31
12	Fencing	m	R 150,77
13	Water management	ha	R 50 255,25
14	2 to 3 years of maintenance and aftercare	ha	R 17 589,34

5.3. Closure liability update 2021

The combined closure liability for all three mining operations associated with the Mining Right (NC 30/5/1/2/2/10053 MR), as calculated in September 2021, amounts to **R38 321 323,95** (including P&Gs, contingencies and excluding VAT). This liability is associated with the activities planned as part of the KMR expansion project.

Table 6 provides the liability calculation summary combined for the proposed activities at Hotazel, Devon and Kipling.

Figure 1 depicts that the rehabilitation of processing waste deposits (waste rock dumps) as well as general surface rehabilitation contribute the majority of the liability cost. Focussed concurrent rehabilitation of residue deposits as well as mine planning with closure in mind can minimise the liability.

Tables 7, 8 and 9 provide the liability per operation, for Hotazel, Devon and Kipling respectively. The detailed closure liability calculations and database have been included in Appendix B.



Table 6: Closure liability calculation 2021 – All operations combined

No	Description	Unit	Quantity	Master Rate	Multiplication factor	Weighing factor 1	Amount (Rand)
2a	Demolition of steel buildings and structures	m ²	403,98	R238,71	1,00	1,00	R96 434,10
2b	Demolition of reinforced concrete buildings and structures	m ²	789	R351,79	1,00	1,00	R277 559,76
3	Rehabilitation of access roads	m ²	82681	R42,72	1,00	1,00	R3 531 881,37
5	Demolition of housing and/or administration facilities	m ²	108	R477,42	1,00	1,00	R51 561,89
6	Opencast rehabilitation including final voids and ramps	ha	24,86	R242 984,15	0,52	1,00	R3 141 104,67
8a	Rehabilitation of overburden and spoils	ha	63,49	R166 847,44	1,00	1,00	R10 593 143,92
8b	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	1,5	R207 805,47	1,00	1,00	R311 708,21
10	General surface rehabilitation	ha	67,12	R132 171,31	1,00	1,00	R8 870 783,53
11	River diversions	ha	20	R132 171,31	1,00	1,00	R-
12	Fencing	m	4752	R150,77	1,00	1,00	R716 438,88
13	Water management	ha	24,86	R50 255,25	0,60	1,00	R749 607,35
14	2 to 3 years of maintenance and aftercare	ha	165,8376	R17 589,34	1,00	1,00	R2 916 973,68
					<i>Sub-total 1</i>		<i>R31 257 197,35</i>
Preliminary and General (12%)			R3 750 863,68		Weighing Factor 2	1,05	R3 938 406,87
Contingencies (10%)							R3 125 719,74
<i>Sub-total 2</i>							<i>R38 321 323,95</i>
VAT (15%)							R5 748 198,59
Grand Total							R44 069 522,55



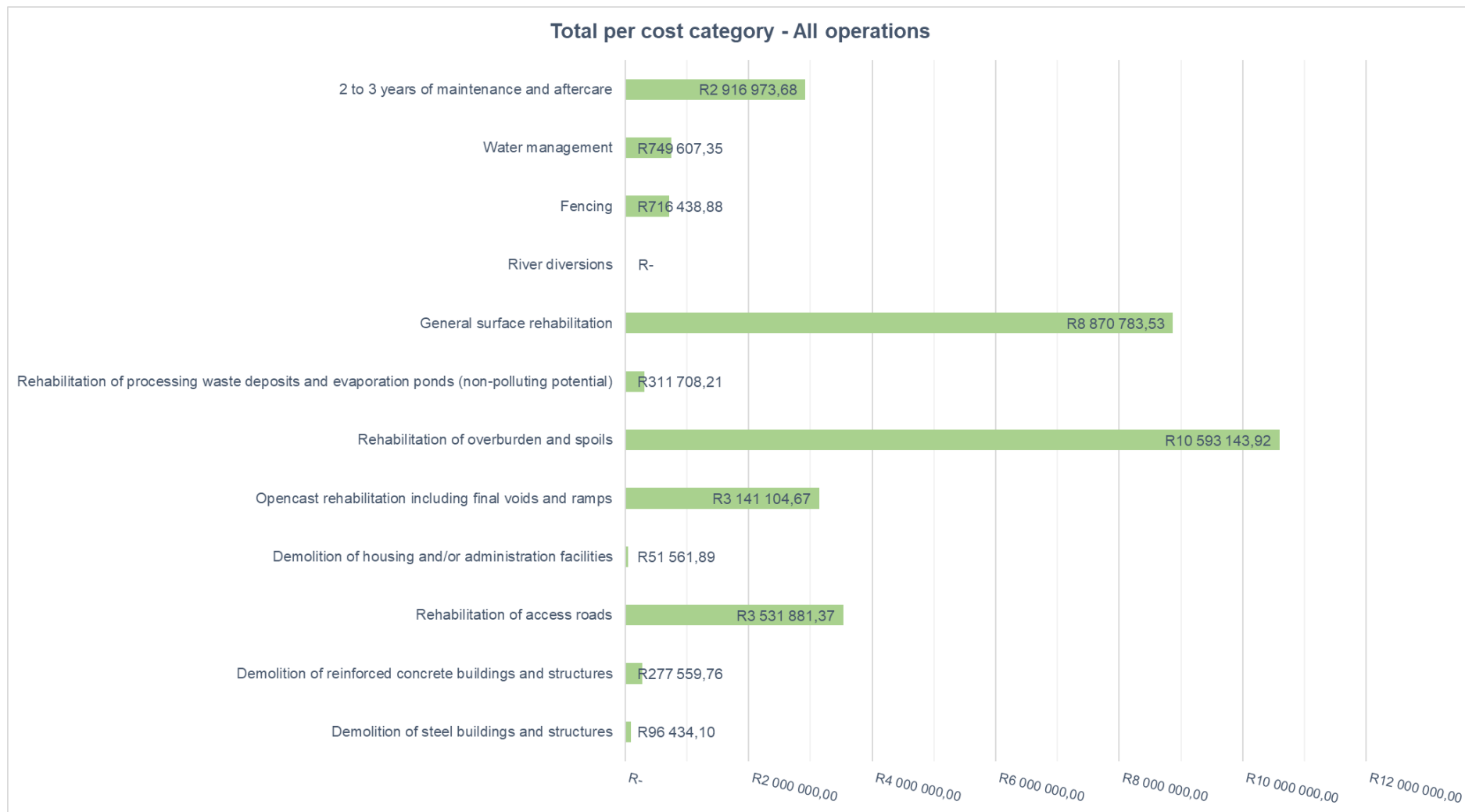


Figure 1: Closure liability per rate category for all operations (10053 MR) (Excl. Contingency, P&Gs and VAT)



5.3.1. Hotazel liability

The closure liability for Hotazel operation associated with the KMR expansion project, as calculated in September 2021, amounts to **R19 036 266,44** (including P&Gs, contingencies and excluding VAT).

Table 7 provides the liability calculation summary for the Hotazel operation.

As depicted in Figure 2, rehabilitation of overburden and spoils (the proposed North and East waste rock dumps) as well as general surface rehabilitation contribute the majority of the liability cost. In order to allow for the mining of the boundary pillar associated with Hotazel pit, an in-stream attenuation dam will be constructed within the Ga-Mogara river. It has been indicated that this attenuation dam will remain in place after the cessation of mining activities at Hotazel; therefore, no liability is associated with the rehabilitation thereof (Component 11).

Table 7: Closure liability calculation 2021 – Hotazel

No	Description	Unit	Quantity	Master Rate	Multiplication factor	Weighing factor 1	Amount (Rand)
2a	Demolition of steel buildings and structures	m ²	43,988	R238,71	1,00	1,00	R10 500,48
2b	Demolition of reinforced concrete buildings and structures	m ²	254	R351,79	1,00	1,00	R89 353,84
3	Rehabilitation of access roads	m ²	39936	R42,72	1,00	1,00	R1 705 944,71
6	Opencast rehabilitation including final voids and ramps	ha	6,86	R242 984,15	0,52	1,00	R866 773,05
8a	Rehabilitation of overburden and spoils	ha	38,49	R166 847,44	1,00	1,00	R6 421 957,94
8b	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0	R207 805,47	1,00	1,00	R-
10	General surface rehabilitation	ha	34,53	R132 171,31	1,00	1,00	R4 563 597,94
11	River diversions	ha	20	R132 171,31	1,00	1,00	R-
12	Fencing	m	1239	R150,77	1,00	1,00	R186 798,77
13	Water management	ha	6,86	R50 255,25	0,60	1,00	R206 850,62
14	2 to 3 years of maintenance and aftercare	ha	83,88	R17 589,34	1,00	1,00	R1 475 356,77



No	Description	Unit	Quantity	Master Rate	Multiplication factor	Weighing factor 1	Amount (Rand)
					<i>Sub-total 1</i>		<i>R15 527 134,12</i>
	Preliminary and General (12%)		R1 863 256,09		Weighing Factor 2	1,05	R1 956 418,90
						Contingencies (10%)	R1 552 713,41
						<i>Sub-total 2</i>	<i>R19 036 266,44</i>
						VAT (15%)	R2 855 439,97
						Grand Total	R21 891 706,40



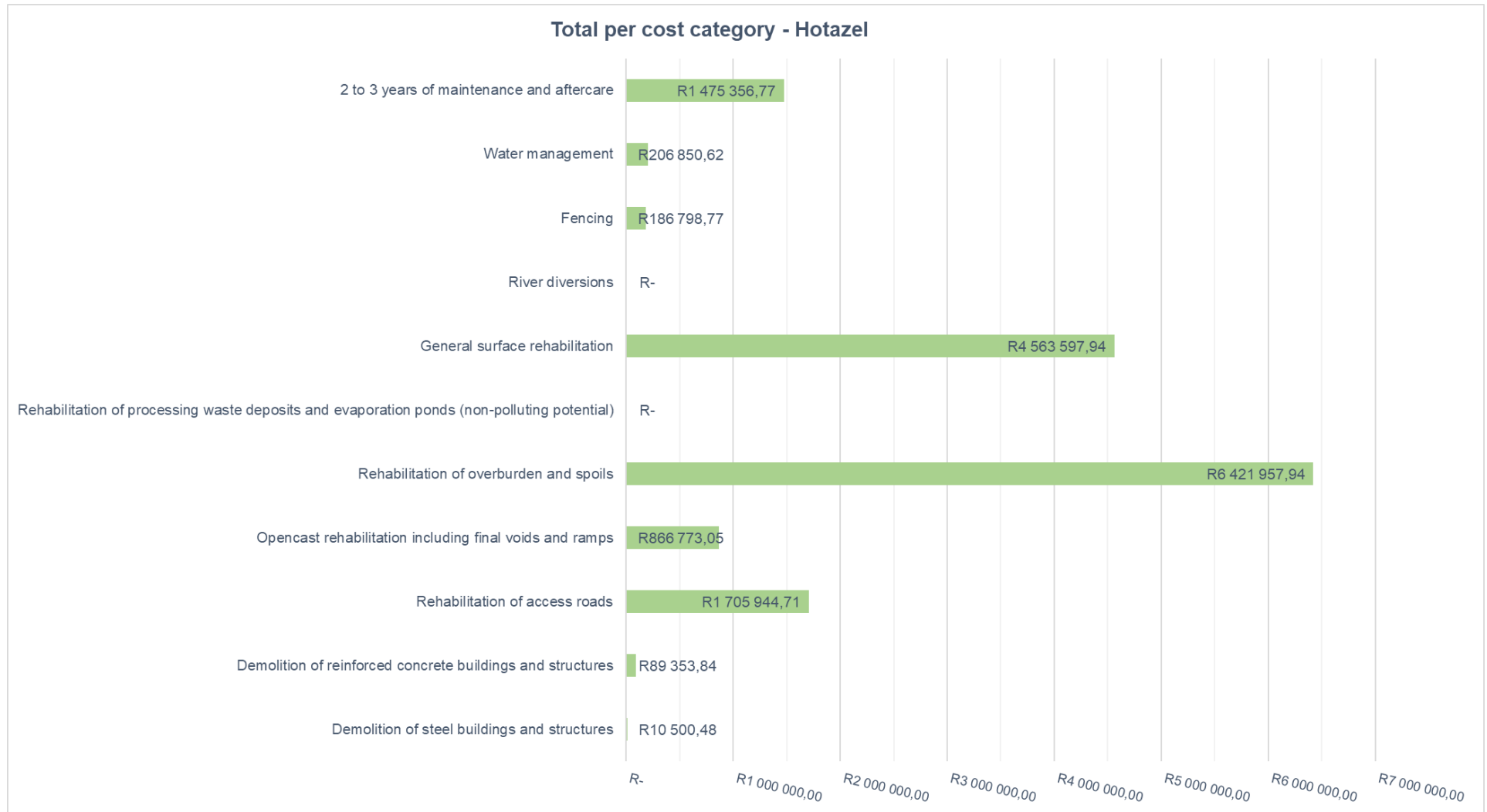


Figure 2: Closure liability per rate category for Hotazel (Excl. Contingency, P&Gs and VAT)



5.3.2. Devon liability

The closure liability for Devon operation associated with the KMR expansion project, as calculated in September 2021, amounts to **R302 818.36** (including P&Gs, contingencies and excluding VAT).

Table 8 provides the liability calculation summary for the Devon operation.

As depicted in Figure 3, the removal of the fencing, demolition of concrete structures and the rehabilitation of access roads associated with the magazine contribute the majority of the liability cost. It should be noted that the Devon pit was included in the Environmental Authorisation application, but the rehabilitation thereof was not included in this liability report as it is covered in the existing liability calculation (Shangoni, 2021).

Table 8: Closure liability calculation 2021 – Devon

No	Description	Unit	Quantity	Master Rate	Multiplication factor	Weighing factor 1	Amount (Rand)
2b	Demolition of reinforced concrete buildings and structures	m ²	209	R351,79	1,00	1,00	R73 523,43
3	Rehabilitation of access roads	m ²	1691	R42,72	1,00	1,00	R72 234,39
12	Fencing	m	584	R150,77	1,00	1,00	R88 047,20
14	2 to 3 years of maintenance and aftercare	ha	0,75	R17 589,34	1,00	1,00	R13 192,00
					<i>Sub-total 1</i>		<i>R246 997,03</i>
Preliminary and General (12%)			R29 639,64		Weighing Factor 2	1,05	R31 121,63
Contingencies (10%)							R24 699,70
					<i>Sub-total 2</i>		<i>R302 818,36</i>
VAT (15%)							R45 422,75
Grand Total							R348 241,11



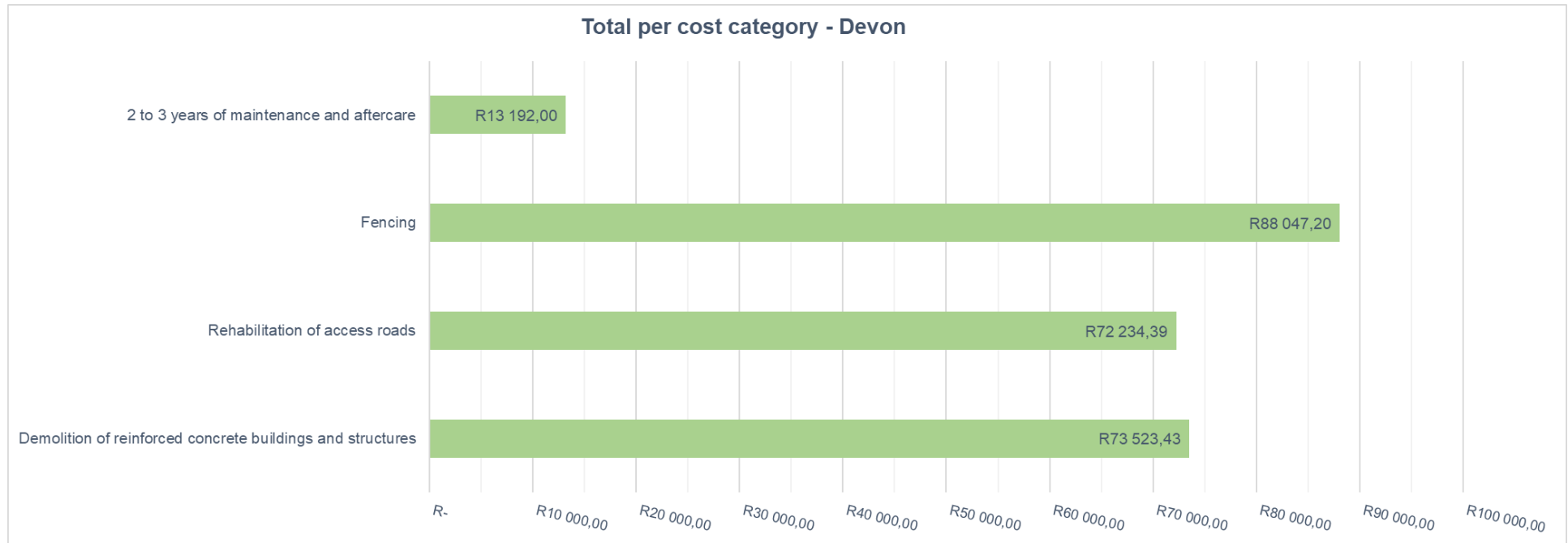


Figure 3: Closure liability per rate category for Devon (Excl. Contingency, P&Gs and VAT)

5.3.3. Kipling liability

The closure liability for Kipling operation associated with the KMR expansion project, as calculated in September 2021, amounts to **R18 982 239.16** (including P&Gs, contingencies and excluding VAT).

Table 9 provides the liability calculation summary for the Kipling operation.

It is evident in Figure 4 that the rehabilitation of overburden and spoils (waste rock dump) as well as general surface rehabilitation contribute the majority of the liability cost. There are no existing mining activities at Kipling and no provision was made as part of April 2021 liability report for the Mining Right. All activities proposed as part of the KMR expansion project associated with Kipling have been costed in this report.



Table 9: Closure liability calculation 2021 – Kipling

No	Description	Unit	Quantity	Master Rate	Multiplication factor	Weighing factor 1	Amount (Rand)
2a	Demolition of steel buildings and structures	m ²	359,99	R238,71	1,00	1,00	R85 933,62
2b	Demolition of reinforced concrete buildings and structures	m ²	326	R351,79	1,00	1,00	R114 682,49
3	Rehabilitation of access roads	m ²	41054	R42,72	1,00	1,00	R1 753 702,28
5	Demolition of housing and/or administration facilities	m ²	108	R477,42	1,00	1,00	R51 561,89
6	Opencast rehabilitation including final voids and ramps	ha	18	R242 984,15	0,52	1,00	R2 274 331,62
8a	Rehabilitation of overburden and spoils	ha	25	R166 847,44	1,00	1,00	R4 171 185,98
8b	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	1,5	R207 805,47	1,00	1,00	R311 708,21
10	General surface rehabilitation	ha	32,59	R132 171,31	1,00	1,00	R4 307 185,59
12	Fencing	m	2929	R150,77	1,00	1,00	R441 592,91
13	Water management	ha	18	R50 255,25	0,60	1,00	R542 756,73
14	2 to 3 years of maintenance and aftercare	ha	81,21	R17 589,34	1,00	1,00	R1 428 424,90
					<i>Sub-total 1</i>		<i>R15 483 066,20</i>
Preliminary and General (12%)			R1 857 967,94		Weighing Factor 2	1,05	R1 950 866,34
					Contingencies (10%)		R1 548 306,62
					<i>Sub-total 2</i>		<i>R18 982 239,16</i>
					VAT (15%)		R2 847 335,87
					Grand Total		R21 829 575,03



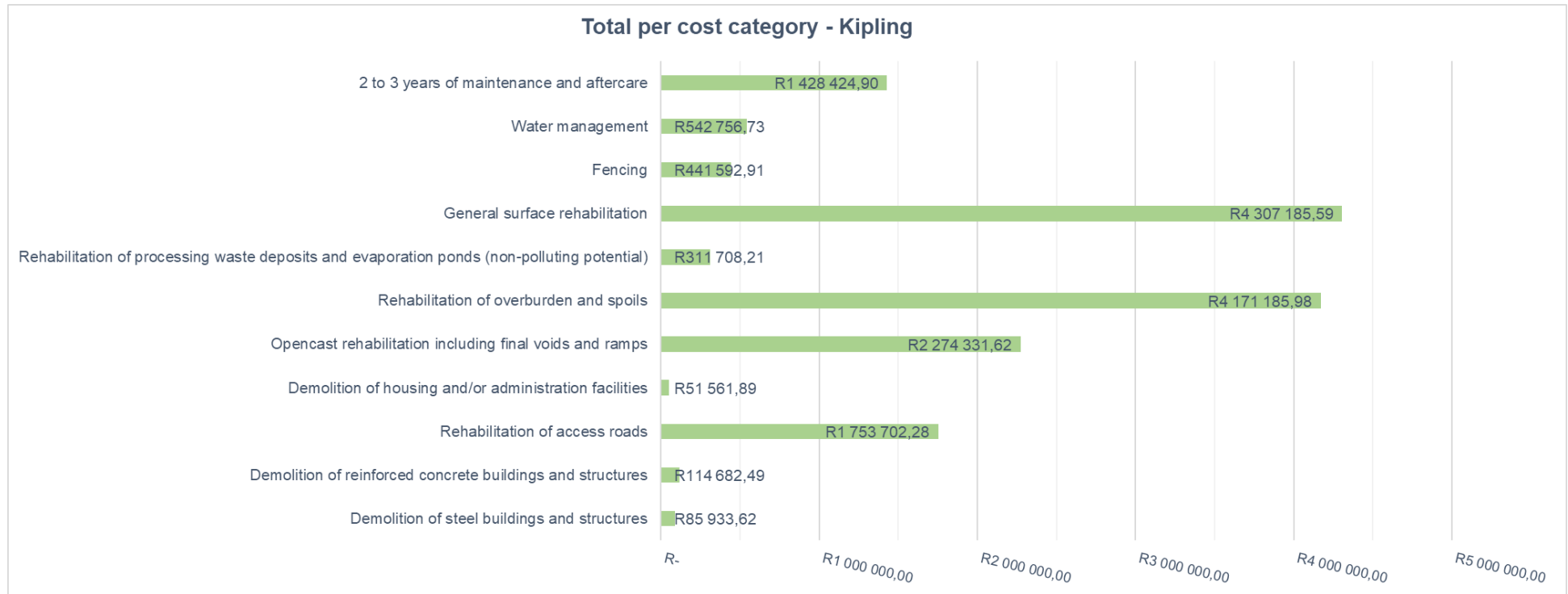


Figure 4: Closure liability per rate category for Kipling (Excl. Contingency, P&Gs and VAT)



6. Knowledge gaps and opportunities

The following knowledge gaps are identified that could have an effect on the closure liability quantum:

- It is important to note that the DMRE opencast rehabilitation closure component (including final voids and ramps) does not allow for backfilling of the void, but only makes provision for the sloping of the pit walls to 1V:3H i.e., making the voids safe for humans and domestic animals. This is contradictory to the KMM EIA/ EMP report which states that “*Once the open pit reaches steady state, ongoing backfilling and rehabilitation of the mined-out areas will occur as mining advances. Upon completion of opencast mining operations, the remaining opencast voids will be backfilled and rehabilitated*” (Metago, 2010). The implementation of the NEMA financial provision regulations may lead to an increase in liability since the actual cost of backfilling will have to be estimated.
- The anticipated liability related to the activities associated with the proposed KMR expansion project was calculated based on the available information that was provided. Assumptions were made to calculate the relevant quantities where no information was available.
- No closure-specific specialist studies were conducted to determine the probability of potential residual and latent risks; therefore, the residual and latent risk liability cannot be determined at this stage.

7. Conclusion

The combined closure liability for all three mining operations associated with the Mining Right (NC 30/5/1/2/2/10053 MR), as calculated in September 2021, is **R38 321 323,95** (including P&G and contingency, excluding VAT). The liability (including P&Gs, contingencies and excluding VAT) per operation is:

- Hotazel – R19 036 266,44;
- Devon – R302 818,36; and
- Kipling – R18 982 239,16.

The financial provision guarantee that is currently available for rehabilitation is R44 518 776.00 as issued by Lombard Insurance (validation document dated 8 September 2020). The liability update completed in April 2021 for Hotazel and Devon indicates a shortfall of R1 105 939.14 between the 2020 guarantee and the 2021 liability estimate. The guarantee will be adjusted in line with the closure liability for the proposed activities after Environmental Authorisation is received.

KMR is in the process of compiling the Final Rehabilitation, Decommissioning and Mine Closure plan, with the associated Risk Assessment as required by the Financial Provision Regulations for all the activities associated with the KMR expansions project.



8. Disclaimer

This report has been produced by Shangoni Management Services (Pty) Ltd., (“Shangoni”) with the skill and care ordinarily exercised by a reasonable Environmental Consultant at the time the services were performed. Further, and in particular, the Services were performed by Shangoni taking into account the limits of the scope of works required by the Client, the time scale involved and the resources, including financial and manpower resources. None of the work performed during this project shall constitute or be represented as a legal opinion of any kind or nature but shall be a representation of the findings.

No warranties or guarantees, expressed or implied, are included in or intended by the report, except that it has been prepared in accordance with the current generally accepted practices and standards consistent with the level of care and skill exercised under similar circumstances by professional consultants or firms that perform the same or similar services. Any reference to legislation in this report should not be perceived as a substitute for the provisions of such legislation. In the event of any inconsistency between this document and such legislation, the latter would prevail.

Whilst every endeavour has been made by the Shangoni to ensure that information provided is correct and relevant, this report is, of necessity, based on information that could reasonably have been sourced within the time period allocated to the assessment, and is, furthermore, of necessity, dependent on information provided by management and/or its representatives. It should, accordingly, not be assumed that all possible and applicable findings, observations and/or measures are included in this report as this report represents a sample of assessable parameters. As a subsequent event, should additional information become available, Shangoni reserves the right to amend its findings, observations, measures and executive summary.

9. Declaration of independence

Shangoni hereby declares that it is an environmental consultant in that it has no business, financial, personal or other interest in this project in respect of which Shangoni is appointed. Furthermore, no circumstances exist that may compromise the objectivity of Shangoni, excluding fair remuneration for work performed in connection with this report.

Report compiled Anika van Vuuren
by:

Report reviewed by: Brian Hayes

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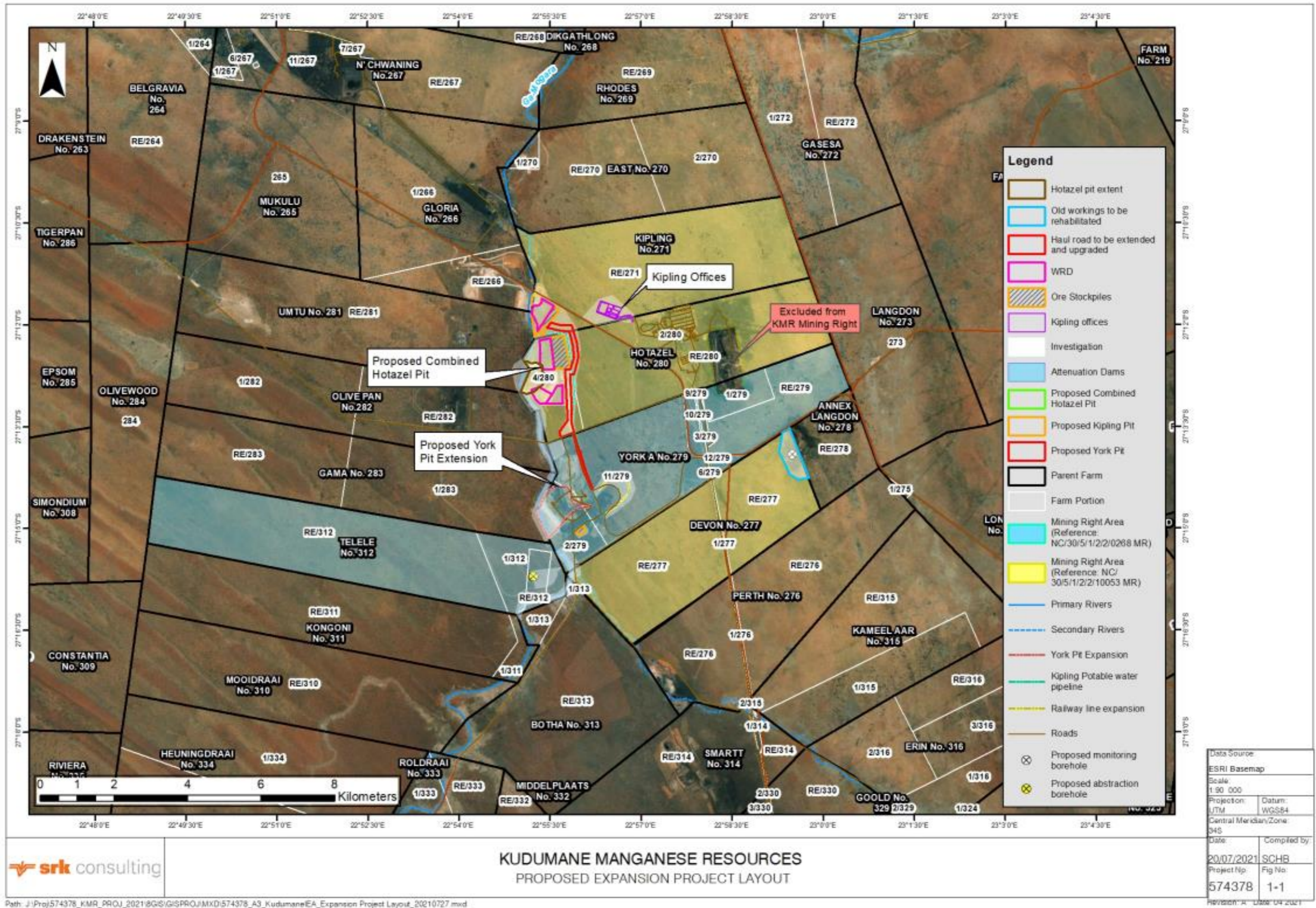
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Appendix A – Maps

To be compiled once data is received





Appendix B: Detailed closure liability calculations

Map Ref. No.	Farm	Main item	Structure activity detail	DMRE Class.	Description	Quantity 2021	Unit	Source of quantity	DMRE Rates 2021	Multiplication factor	Weighing factor 1	Cost 2021	Notes 2021
D1	Devon 277	Establish magazine	Explosives Concrete slabs	2b	Demolition of reinforced concrete buildings and structures	209	m ²	Proposed Magazine layout	R351,79	1	1,00	R73 523,43	Waiting for footprint, measurements assumed based on Proposed Magazine layout.
D3	Devon 277	Establish magazine	Explosives Fence (double)	12	Fencing	584	m	Proposed Magazine layout	R150,77	1	1,00	R88 047,20	Double fence, measurements and location assumed based on Proposed Magazine layout, 5 m gap between two fences.
D5	Devon 277	Establish magazine	Explosives Access road	3	Rehabilitation of access roads	1691	m ²	Google earth	R42,72	1	1,00	R72 234,39	Measurements and location assumed, 5 m width.
D4	Devon 277	General area			General footprint for maintenance and aftercare	0,75	ha	Proposed Magazine layout	R17 589,34	1	1,00	R13 192,00	
H3	Hotazel 280	Establish Run of Mine Stockpile			ROM stockpile cleared area	29,44	ha	EA Application	R132 171,31	1	1,00	R3 891 123,51	36 ha total footprint, excluded ROM stockpile footprint (C8) and topsoil footprint (E4) already costed in existing liability database (Report dated April 2021).
H4	Hotazel 280	Establish Waste Rock Dump North			WRD	27,37	ha	EA Application	R166 847,44	1	1,00	R4 566 614,41	28 ha total footprint, excluded ew disturbed area (C10) already costed in existing liability database (Report dated April 2021).
H5	Hotazel 280	Establish Waste Rock Dump South			WRD	0	ha	N/A	R166 847,44	1	1,00	R-	Total footprint of south waste dump already costed in the existing liability database (Report dated April 2021) under waste rock dump (F) and a section of the pit (D).
H6	Hotazel 280	Establish Waste Rock Dump East			WRD	11,12	ha	EA Application	R166 847,44	1	1,00	R1 855 343,52	14,5 ha footprint. Sections of this footprint already costed in existing liability database (Report dated April 2021) - Topsoil dump footprint (E2), Disturbed area (C2) and a section already costed as waste rock dump (F).
H7	Hotazel 280	Expansion of Hotazel pit			Pit	6,86	ha	Google earth	R242 984,15	0,52	1,00	R866 773,05	25 ha as per EA application covers the entire pit including the expansion to mine the boundary pillar. The rehabilitation of the existing pit has already been costed in the existing liability database (Report dated April 2021) under Opencast pit (D1). This footprint has been subtracted from the expansion footprint provided.
H8	Hotazel 280	Establish Attenuation dam			Dam	20	ha	EA Application	R132 171,31	1	1,00	R-	Dam will remain post-closure, i.e., river diversion will remain after closure of the mine and no liability is associated with rehabilitation of the river.
H1	Hotazel 280	Establish Potable water tank			Steel water tank	44,0	m ²	Workshop discussion & calculation	R238,71	1	1,00	R10 500,48	Floor mounted circular steel 500 KI with booster pump (7 m diameter). 4 m height assumed. Measurements and exact location assumed.
H1a	Hotazel 280	Establish Potable water tank			Concrete slabs	64	m ²	Workshop discussion	R351,79	1	1,00	R22 514,35	Concrete footprint (8m x 8m). Measurements and exact location assumed.
H2	Hotazel 280	Establish Sewage Treatment Plant			Concrete slabs	190	m ²	Workshop discussion - same as York	R351,79	1	1,00	R66 839,49	Cost the same as for existing Liliput STP at York.
H2a	Hotazel 280	Establish Sewage Treatment Plant			General disturbed footprint	0,0879	ha	Workshop discussion - same as York	R132 171,31	1	1,00	R11 617,86	Cost the same as for existing Liliput STP at York.



Map Ref. No.	Farm	Main item	Structure activity detail	DMRE Class.	Description	Quantity 2021	Unit	Source of quantity	DMRE Rates 2021	Multiplication factor	Weighing factor 1	Cost 2021	Notes 2021
H2b	Hotazel 280	Establish Sewage Treatment Plant	Fence	12	Fencing	220	m	Workshop discussion - same as York	R150,77	1	1,00	R33 168,47	Cost the same as for existing Liliput STP at York.
H2c	Hotazel 280	Establish Sewage Treatment Plant	Access road	3	Rehabilitation of access roads	128	m ²	Google earth	R42,72	1	1,00	R5 467,77	Measurements and exact location assumed.
H10	Hotazel 280	Establishment of Truck Parking Area	General disturbed footprint	10	General surface rehabilitation	5	ha	EA Application	R132 171,31	1	1,00	R660 856,57	Cost as per EA application.
H10a	Hotazel 280	Establishment of Truck Parking Area	Fence	12	Fencing	1019	m	Google earth & Workshop discussion	R150,77	1	1,00	R153 630,31	
NOM	Hotazel 280	Relocation of Admin offices and security building	N/A	5	Demolition of housing and/or administration facilities	0	m ²	N/A	R477,42	1	1,00	R-	Relocate outside of blast zone. The Kipling offices will provide the alternative location. The existing admin office and security structures has already been costed in the existing liability database (Report dated April 2021). No liability associated.
NOM	Hotazel 280	Rehabilitation of road due to construction of New Waste Rock Dump	N/A	3	Rehabilitation of access roads	0	m ²	N/A	R42,72	1	1,00	R-	Road has already been covered by waste rock dump footprint. Remainder of road to south of WRD has been costed in the existing liability database (Report dated April 2021).
H9	Hotazel 280	Establish Haul Road	Haul road	3	Rehabilitation of access roads	39808	m ²	Google earth & Workshop discussion	R42,72	1	1,00	R1 700 476,94	Part of haul road on Hotazel property.
NOM	Hotazel 280	Pollution control dam	Dam	8b	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	0		Workshop discussion	R207 805,47	1	1,00	R-	Additional PCD At North WRD
NOM	Hotazel 280	General area	General surface rehabilitation	10	General surface rehabilitation	0	ha	Update from spreadsheet	R132 171,31	1	1,00	R-	Shaping and seeding already included in rates (1,2a,2b,3,6 & 8a). No additional cost for general surface rehabilitation.
NOM	Hotazel 280	General area	Pit expansion water management	13	Water management	6,86	ha	Update from spreadsheet	R50 255,25	0,6	1,00	R206 850,62	Applied only to pit expansion footprint.
NOM	Hotazel 280	General area	Maintenance and aftercare	14	2 to 3 years of maintenance and aftercare	78,88	ha	Update from spreadsheet	R17 589,34	1	1,00	R1 387 410,08	Applied to components 6, 8a, 10, 2b and 3 footprints above.
K12	Kipling 271	Establish Opencast pit	Pit	6	Opencast rehabilitation including final voids and ramps	18	ha	EA Application	R242 984,15	0,52	1,00	R2 274 331,62	Combined 18 ha (6 ha and 12 ha) as per EA application.
K13	Kipling 271	Establish Waste rock dump	WRD	8a	Rehabilitation of overburden and spoils	25	ha	EA Application	R166 847,44	1	1,00	R4 171 185,98	Cost as per EA application.
K14	Kipling 271	Establish Topsoil dump	WRD	8a	Rehabilitation of overburden and spoils	0	ha	N/A	R166 847,44	1	1,00	R-	Topsoil dump below ROM stockpile area. No indication of footprint.
K15	Kipling 271	Establish RoM Stockpiles	ROM stockpile cleared area	10	General surface rehabilitation	11	ha	EA Application	R132 171,31	1	1,00	R1 453 884,46	Cost as per EA application.



Map Ref. No.	Farm	Main item	Structure activity detail	DMRE Class.	Description	Quantity 2021	Unit	Source of quantity	DMRE Rates 2021	Multiplication factor	Weighing factor 1	Cost 2021	Notes 2021
K16	Kipling 271	Establish Haul Road	Road	3	Rehabilitation of access roads	20800	m ²	Google earth & Workshop discussion	R42,72	1	1,00	R888 512,87	Part of haul road on Kipling property.
K2	Kipling 271	Establish Sewerage Treatment Plant	Concrete slabs	2a	Demolition of steel buildings and structures	190	m ²	Workshop discussion - same as York	R238,71	1	1,00	R45 355,37	Cost the same as for existing Liliput STP at York.
K2a	Kipling 271	Establish Sewerage Treatment Plant	General disturbed footprint	10	General surface rehabilitation	0,0879	ha	Workshop discussion - same as York	R132 171,31	1	1,00	R11 617,86	Cost the same as for existing Liliput STP at York.
K2b	Kipling 271	Establish Sewerage Treatment Plant	Fence	12	Fencing	220	m	Workshop discussion - same as York	R150,77	1	1,00	R33 168,47	Cost the same as for existing Liliput STP at York.
K3	Kipling 271	Establish Potable water tank	Steel water tank	2a	Demolition of steel buildings and structures	44,0	m ²	Workshop discussion & calculation	R238,71	1	1,00	R10 500,48	Floor mounted circular steel 500 KI with booster pump (7 m diameter). 4 m height assumed. Measurements and exact location assumed.
K3a	Kipling 271	Establish Potable water tank	Concrete slabs	2b	Demolition of reinforced concrete buildings and structures	64	m ²	Workshop discussion	R351,79	1	1,00	R22 514,35	Concrete footprint (8m x 8m). Measurements and exact location assumed.
K4a	Kipling 271	Establish Office area	Buildings with concrete slabs	5	Demolition of housing and/or administration facilities	108	m ²	Workshop discussion	R477,42	1	1,00	R51 561,89	Exact location assumed.
K4b	Kipling 271	Establish Office area	Steel covered parkings	2a	Demolition of steel buildings and structures	126	m ²	Google earth & Workshop discussion	R238,71	1	1,00	R30 077,77	10 parking bays. Exact location assumed. Used York parking structure as reference to measure.
K4c	Kipling 271	Establish Office area	General disturbed footprint	10	General surface rehabilitation	20	ha	EA Application	R132 171,31	1	1,00	R2 643 426,30	Cost as per EA application.
K5	Kipling 271	Establish Diesel Bay and fuel storage	Concrete slabs	2b	Demolition of reinforced concrete buildings and structures	40	m ²	Workshop discussion	R351,79	1	1,00	R14 071,47	Costed for concrete bundwall. No information to cost for the tanks (self-contained tanks with associated infrastructure).
K5a	Kipling 271	Establish Diesel Bay and fuel storage	General disturbed footprint	10	General surface rehabilitation	0,7	ha	EA Application	R132 171,31	1	1,00	R92 519,92	Cost as per EA application.
NOM	Kipling 271	Establish Waste storage facility	Concrete slabs	2b	Demolition of reinforced concrete buildings and structures	122	m ²	Workshop discussion	R351,79	1	1,00	R42 917,99	Same as currently at York (12p). Use York footprint measurement for slab under bins
K6	Kipling 271	Establish Waste storage facility	General disturbed footprint	10	General surface rehabilitation	0,8	ha	EA Application	R132 171,31	1	1,00	R105 737,05	Cost as per EA application.
K6a	Kipling 271	Establish Waste storage facility	Fence	12	Fencing	359	m	Google earth & Workshop discussion	R150,77	1	1,00	R54 124,91	
K8	Kipling 271	Establish Pollution control dam	Dam	8b	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	1,5	ha	EA Application	R207 805,47	1	1,00	R311 708,21	Cost as per EA application.



Map Ref. No.	Farm	Main item	Structure activity detail	DMRE Class.	Description	Quantity 2021	Unit	Source of quantity	DMRE Rates 2021	Multiplication factor	Weighing factor 1	Cost 2021	Notes 2021
K8a	Kipling 271	Establish Pollution control dam	Fence	12	Fencing	500	m	Google earth & Workshop discussion	R150,77	1	1,00	R75 382,88	Measurements and exact location assumed
K1	Kipling 271	Kipling offices	Fence	12	Fencing	1850	m	Google earth & Workshop discussion	R150,77	1	1,00	R278 916,65	
NOM	Kipling 271	Establish Pollution control dam	Concrete sump	2b	Demolition of reinforced concrete buildings and structures	100	m ²	Google earth (using concrete sump footprint at York) & Workshop discussion	R351,79	1	1,00	R35 178,68	Costed for concrete sump (same size as one at York PCD).
K10	Kipling 271	Upgrade access gravel road to Kipling offices	Access road	3	Rehabilitation of access roads	20254	m ²	Google earth	R42,72	1	1,00	R865 189,41	
NOM	Kipling 271	Powerlines	Powerlines	1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	0	m ³	N/A	R17,14	1	1,00	R-	Extension of powerlines to associated infrastructure (Extension of 11kV supply). No designs with quantities available.
NOM	Kipling 271	Additional electrical infrastructure	MCC's & Transformers	2b	Demolition of reinforced concrete buildings and structures	0	m ²	N/A	R351,79	1	1,00	R-	MCC & transformer (bundled). Cannot cost, no data.
NOM	Kipling 271	General area	General surface rehabilitation	10	General surface rehabilitation	0	ha	Update from spreadsheet	R132 171,31	1	1,00	R-	Shaping and seeding already included in rates (1,2a,2b,3,6 & 8a). No additional cost for general surface rehabilitation.
NOM	Kipling 271	General area	Pit water management	13	Water management	18	ha	Updated spreadsheet	R50 255,25	0,6	1,00	R542 756,73	Applied to pit footprint
NOM	Kipling 271	General area	Maintenance and aftercare	14	2 to 3 years of maintenance and aftercare	81,21	ha	Updated spreadsheet	R17 589,34	1	1,00	R1 428 424,90	Applied to components 6, 8a,8b, 10, 2b and 3 footprints above



Appendix C: Detailed CVs for the project team

