
LETTER OF AGREEMENT

by and between:

HOTAZEL MANGANESE MINES PROPRIETARY LIMITED ("HMM")

and

TSHIPI É NTLÉ MANGANESE MINING PROPRIETARY LIMITED ("Tshipi")

in respect of

**MERGING OF TWO WASTE ROCK DUMPS - HMM SINTERFONTEIN DUMP AND TSHIPI
EASTERN DUMP**

IT BEING HEREBY RECORDED AND AGREED AS FOLLOWS:

1. The parties to this letter of agreement ("**LoA**") are:
 - 1.1 **HOTAZEL MANGANESE MINES PROPRIETARY LIMITED**, with registration number 2007/004878/07, a private company registered in terms of the laws of the Republic of South Africa, with its main registered offices situated at 39 Melrose Boulevard, Melrose Arch, Johannesburg, Gauteng, 2076; and
 - 1.2 **TSHIPI É NTLÉ MANGANESE MINING PROPRIETARY LIMITED** with registration number 2008/003117/07, a private company registered in terms of the laws of the Republic of South Africa, with its main registered offices situated at 21 Central Street, Houghton, 2198,

(herein after referred to as the "**Parties**").
2. The Parties intend to merge (combine) the HMM Sinterfontein Dump and the Tshipi Eastern Dump, by filling the void between the two dumps with waste rock ("**Fill the Void**").
3. The Parties shall either jointly, or separately, apply to the relevant governmental bodies for the relevant environmental authorisations to Fill the Void.
4. Once the relevant environmental authorisations have been obtained to Fill the Void, the Parties shall comply with the various rights and obligations of the Parties as set out in the environmental authorisations.
5. The Parties shall comply with the rehabilitation objectives of the rehabilitation plan for both mines in respect of Filling the Void, attached hereto as Annexure "**A**".

Signed at _____ on _____ 2019

For: HOTAZEL MANGANESE MINES PROPRIETARY LIMITED

Signed at _____ on _____ 2019

For: TSHIPI É NTLE MANGANESE MINING PROPRIETARY LIMITED

Tshipi Borwa Mine, Tshipi é Ntle Manganese Mining (Pty) Ltd
and Mamatwan Mine, Hotazel Manganese Mines (Pty) Ltd

REHABILITATION STRATEGY FOR THE COMBINED TSHIPI / MAMATWAN WASTE ROCK DUMP

1. INTRODUCTION

Tshipi propose to extend the Tshipi Eastern Waste Rock Dump (WRD) in a south-easterly direction towards their mining right boundary to merge with the nearby Mamatwan Sinterfontein WRD. Similarly, Mamatwan propose to extend the Mamatwan Sinterfontein WRD in a north-westerly direction towards their mining right boundary, to merge with the nearby Tshipi Eastern WRD. The filling of the void between these two WRDs, will result in a single/merged WRD that both parties will ultimately be responsible for managing and rehabilitating in terms of the rehabilitation objectives of their respective Environmental Authorisations.

The purpose of this document therefore is to align the rehabilitation strategy and objectives associated with the merged waste rock dump between Tshipi and Mamatwan. .

2. CURRENT AND PROPOSED REHABILITATION COMMITMENTS

The current EMPr rehabilitation commitments for the respective Tshipi and Mamatwan WRDs are detailed in Table 2-1, as well as, the proposed rehabilitation commitments for the merged WRD.

Mamatwan's WRD rehabilitation commitments are based on their current 2005 EMPr ("Environmental Mangement Programme – Mamatwan Mine", Report No. 64/05/A095, prepared by Jones and Wagener, dated June 2005).

Tshipi's WRD rehabilitation commitments are based on the proposed 2018 EMPr ("Environmental Impact Report for the Tshipi Borwa Waste Rock Dump Extension Project", Project No. 710.20008.00041, prepared by SLR Consulting, dated September 2018).



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Table 2-1: Current and Proposed WRD Rehabilitation Commitments

Rehabilitation Aspects to be Considered	Tshipi 2018 EMPr Commitments	Mamatwan 2005 EMPr Commitment	Proposed Commitment for the Merged WRD
Post closure land use	Most likely wilderness (although limited and controlled grazing may also be possible).	Grazing. Initial post mining period will be wilderness, and not for grazing until such time as the long term sustainability of the vegetation is established.	Wilderness (i.e. non-grazing land)
Topsoil stripping prior to waste rock deposition	<p>Topsoil will be stripped to a depth of between 0.3 m to 0.5 m.</p> <p>The first 0.15 m of topsoil (A and B horizons) should be stripped separately and not mixed with the deeper horizons.</p>	A minimum layer of 0.2 m of topsoil should be stripped.	<p>Topsoil will be stripped to a depth of at least 0.2 m</p> <p>The first 0.15 m of topsoil (A and B horizons) should be stripped separately and not mixed with the deeper horizons.</p>
Pre-closure decommissioning activities	WRD to be shaped to ensure the area is free draining (i.e. no ponding of water on the top surface post closure).	WRD to be capped and vegetated so as to limit/ prevent recharge to groundwater.	WRD to be shaped to ensure the area is free draining (i.e. no ponding of water on the top surface post closure).
Side slope angle	WRD side slopes will be flattened to 1V:3H.	<p>WRD side slopes will be flattened to 1V:3H.</p> <p>Optimisation of the WRD side slopes still to be investigated by field trials.</p>	<p>WRD side slopes will be flattened to a minimum of 1V:3H.</p> <p>WRD side slopes to be confirmed through ongoing field trials.</p>
Capping	WRD will be capped with a 300 mm topsoil/growth medium material.	<p>WRD will be capped with a 500 mm topsoil/growth medium material.</p> <p>Optimisation of the thickness of capping material still to be investigated by field trials.</p>	<p>WRD will be capped with a minimum of 300 mm topsoil/growth medium material.</p> <p>Capping thickness to be confirmed through ongoing field trials.</p>

Rehabilitation Aspects to be Considered	Tshipi 2018 EMPr Commitments	Mamatwan 2005 EMPr Commitment	Proposed Commitment for the Merged WRD
Revegetation	<p>WRD to be revegetated using a mix of indigenous grasses (i.e. dry seeding) and trees/shrubs (i.e. hand planting of seedlings).</p> <p>Field trials should however be undertaken to determine the best revegetation techniques and plant species.</p>	<p>WRD to be revegetated by seeding (using indigenous material harvested from the surrounding vegetation).</p> <p>Optimisation of the vegetation species still to be investigated by field trials.</p>	<p>WRD to be revegetated using a mix of indigenous grasses (i.e. dry seeding) and trees/shrubs (i.e. hand planting of seedlings).</p> <p>Vegetation species to be confirmed through ongoing field trials.</p>
Storm water management	<p>WRD slopes may require energy/flow breakers to curb the velocity of storm water runoff.</p>	<p>WRD slopes may require intermediate berms, lined down chutes or contour drains to manage erosion.</p> <p>Each WRD will be evaluated to determine the risk of erosion.</p>	<p>Evaluate the risk of erosion for the merged WRD.</p> <p>Storm water management infrastructure to be confirmed through ongoing field trials.</p>
Erosion management	<p>Voids of nearby previous pollution control dams may be used during the maintenance and aftercare phase to act as settling dams and/or silt traps (i.e. following periods of heavy rainfall).</p>	<p>No details provided</p>	<p>Erosion management measures and/or mitigation measures to be confirmed through ongoing field trials.</p>
Post closure monitoring	<p>Bi-annual inspections by a suitably qualified engineer and/or environmental scientist during the estimated 5-year maintenance and aftercare period.</p>	<p>Post closure monitoring period estimated to be 3 years in total.</p>	<p>Post closure monitoring period to be confirmed through ongoing field trials.</p>

Rehabilitation Aspects to be Considered	Tshipi 2018 EMPr Commitments	Mamatwan 2005 EMPr Commitment	Proposed Commitment for the Merged WRD
Maintenance and aftercare period	<p>Estimated to be 5 years in total (i.e.3 years active and a further 2 years passive).</p> <p>Field trials should however be undertaken to more accurately determine the time taken to meet the criteria for WRD revegetation success.</p>	Maintenance and aftercare period estimated to be 3 years in total.	Maintenance and aftercare period to be confirmed through ongoing field trials.
Relinquishment criteria	<p>WRD relinquishment criteria will be through analysis of the vegetative cover.</p> <p>Proposed indicators for WRD relinquishment criteria are:</p> <ol style="list-style-type: none"> 1) Basal cover greater than or equal to 8%. 2) Density of vegetation greater than or equal to 80% of similar reference plots. 3) Species composition similar to reference plots. 4) No Category 1 alien invasive species occur. 	<p>The success of the revegetation program will be based not only on basal cover, but also the diversity of species and the extent to which there are local indigenous species.</p> <p>Invader plants will be eradicated ... following rehabilitation until a self-sustaining vegetation cover is achieved.</p>	<p>WRD relinquishment criteria will be through analysis of the vegetative cover.</p> <p>No Category 1 alien invasive species to establish on the merged WRD.</p> <p>Relinquishment criteria to be confirmed through ongoing field trials.</p>

3. REVEGETATION FIELD TRIALS

Many of the proposed rehabilitation commitments for the merged WRD in the table above need to be confirmed by way of revegetation field trials.

To date, Mamatwan have initiated revegetation field trials, and the results currently indicate that WRD slopes that are rehabilitated at 1V:3H with a topsoil and/or growth medium capping material, erode significantly, have little to no vegetation growth and are therefore not suitable for grazing. It has therefore been recommended that Mamatwan consider changing the final land use of grazing to wilderness based on the outcome of a socio-economic land use study focussing on the post closure environment.

4. MINE CLOSURE PLANNING

Both Tshipi and Mamatwan are in the process of developing conceptual/preliminary mine closure plans in accordance with the New Financial Provisioning Regulations, 2015 that are anticipated to come into effect from February 2020.

As part of the ongoing closure planning process, a number of gaps have been identified within Tshipi's 2018 Preliminary Closure Plan (that forms part of the 2018 EMP) and these may have a bearing on the final closure and rehabilitation activities proposed for the merged WRD. The gaps currently identified include:

- Re-evaluate the mine closure solution for Tshipi Borwa Mine in context of evolving technical, commercial, socio-economic, environmental, legal and cumulative considerations.
- Establish and monitor trial vegetation programmes to evaluate the effectiveness and sustainability of revegetation efforts; methods to further improve and/or optimise; as well as inform the post closure maintenance and aftercare period.
- Identify what species of grasses, shrubs and trees will best support the post closure land use of wilderness and/or grazing.
- Initiate trials of seed collection and germination (i.e. on site nursery) to inform: (i) the revegetation plan (i.e. suitable plant species and methodology for re-establishing vegetation) and (ii) to provide sufficient plant stock for revegetation purposes.
- Assess the likelihood and/or presence of any Category 1 alien invasive plant species on site.
- Develop and incorporate socio-economic aspects into the closure plan. Community development initiatives and programmes together with end land use objectives for the mining area form an important part of this study (e.g. alternative post closure land uses for the WRDs such as aggregate production).
- Compile a detailed storm water management plan at closure for the detailed design and quantification of any storm water infrastructure.

These gaps will be addressed during ongoing mining operations and the development of a Final LOM closure plan.

Similarly, it is anticipated that a number of gaps will be identified during Mamatwan's ongoing closure planning process that may have a bearing on the final closure and rehabilitation activities proposed for the merged WRD (as already identified by the reliance on ongoing field trial data in the table above). **Mamatwan may want to add something in here**

5. CONCLUSION AND RECOMMENDATIONS

This is the first draft rehabilitation strategy agreed to by both Tshipi and Mamatwan for the merged WRD.

As can be seen in the table above, Tshipi and Mamatwan have very similar EMPr closure commitments related to the merged WRD.

It is recommended that this draft rehabilitation strategy form part of both Tshipi and Mamatwan future mine closure plans (i.e. the mine closure plans that are currently being prepared and/or updated in accordance with the New Financial Provisioning Regulations, 2015 that are anticipated to come into effect from February 2020).

This draft rehabilitation strategy will then be further clarified and amended during the ongoing development and finalisation of both Tshipi and Mamatwan's mine closure plans.

S van Niekerk
For SLR Consulting (Africa) Pty (Ltd)