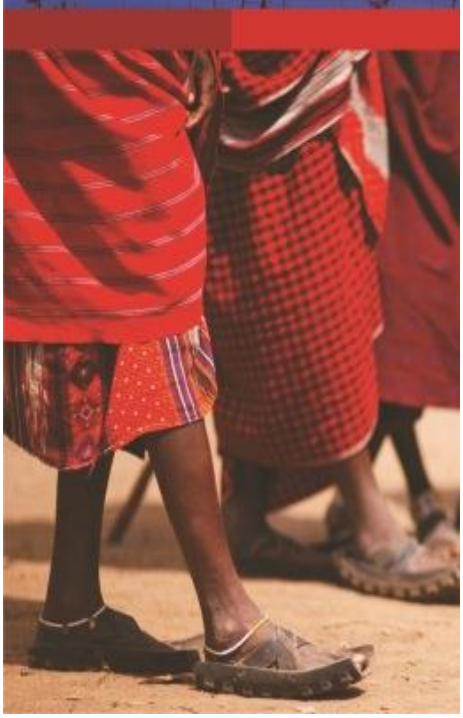


DIGBY WELLS
ENVIRONMENTAL

Closure Liability Report

Closure Report

Project Number:

LAN3111

Prepared for:

LANXESS Chrome Mining (Pty) Ltd

February 2015

Digby Wells and Associates (South Africa) (Pty) Ltd
(Subsidiary of Digby Wells & Associates (Pty) Ltd). Co. Reg. No. 2010/008577/07. Fern Isle, Section 10, 359 Pretoria Ave Randburg Private Bag X10046, Randburg, 2125, South Africa
Tel: +27 11 789 9495, Fax: +27 11 789 9498, info@digbywells.com, www.digbywells.com

Directors: AR Wilke, DJ Otto, GB Beringer, LF Koeslag, AJ Reynolds (Chairman) (British)*, J Leaver*, GE Trusler (C.E.O)
*Non-Executive

This document has been prepared by Digby Wells Environmental.

Report Type:	**Closure Report**
Project Name:	**Closure Liability Report**
Project Code:	**LAN3111**

Name	Responsibility	Signature	Date
Hlayiseko Mashaba	Report Writer		March 2015
Renée van Aardt	Report Reviewer		March 2015

This report is provided solely for the purposes set out in it and may not, in whole or in part, be used for any other purpose without Digby Wells Environmental prior written consent.

EXECUTIVE SUMMARY

Digby Wells Environmental (Digby Wells) was appointed by Lanxess Chrome Mining (Pty) Ltd (LANXESS) to calculate their closure liability for the expanded underground section and for the new proposed opencast section in support of the section 102 amendment. The proposed mining activities will involve the authorisation of the proposed open pit mining operation on the farm Rietfontein 338 JQ (owned by the mine) and the proposed underground mining operations on portions of the farms Kroondal 304 JQ, Klipfontein 300 JQ and Brakspruit 299 JQ. The following associated surface infrastructure will be constructed in support of the additional mining activities proposed for the site: Haul roads, office and workshop, and carport.

Closure liability costs were calculated by means of the DMR's standard method for assessment of mine closure. The closure liability focused on the proposed mining activities and also the existing infrastructure at Wonderkop Mine, the cost for rehabilitation and closure of the proposed site according to the DMR Guideline format is R39 496 123. Allowance has been made for the backfilling of the final void, demolition and management of physical infrastructure, replacement of soil and re-vegetation, and for the general surface rehabilitation of all the disturbed areas within new proposed site.

This report did not attempt to quantify the groundwater impacts or the mitigation thereof as these impacts and their mitigation cannot be accurately predicted without the availability of a detailed hydrogeological study of the area. Cost has been allocated to undertake a detailed study which will describe the potential decant water quality and quantity.

It is a requirement of the Section 24P of NEMA, as amended by the National Environmental Management Laws Amendment Act, 2014 (Act No 25 of 2014) (NEMLA) that the liability figures be updated on an annual basis, or when detailed evaluations of the requirements for hydrogeological closure, or other closure cost items, are obtained.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF APPENDICES

1 Introduction

Digby Wells Environmental (Digby Wells) was appointed by Lanxess Chrome Mining (Pty) Ltd (LANXESS) to calculate their closure liability for the expanded underground section and for the new proposed opencast section in support of the Section 102 amendment undertaken in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA). The closure cost estimate is based on all associated surface infrastructure that will be constructed in support of the additional mining activities proposed for the site and also the existing infrastructure at Wonderkop Mine.

This closure cost calculation is based on the rehabilitation DMR guidelines in the "Guideline Document for the Evaluation of the Quantum of Closure-Related Financial Provision Provided by a Mine". The focus of this financial provision calculation is on the cost to backfill the final void, demolish the proposed infrastructures and the general surface rehabilitation of the disturbed areas. It is expected that concurrent rehabilitation on the pit and various other management measures will be undertaken, whereby environmental liabilities will be reduced during the mine's operations and after closure

2 Terms of Reference

Section 41 (1) of the Mineral and Petroleum Resources Development Act (MPRDA), (28 of 2002) states that, "*an applicant for a prospecting right, mining right or mining permit must, before the Minister approves the environmental management plan or environmental management programme in terms of section 39(4), make the prescribed "financial provision" for the rehabilitation or management of negative environmental impacts*." In terms of Section 24P of NEMA, as amended by the National Environmental Management Laws Amendment Act, 2014 (Act No 25 of 2014) (NEMLA) provides that the holder of a mining right must make financial provision for rehabilitation of negative environmental impacts[1].

3 Study Area and Description

LANXESS Chrome Mine is located 7 km east of Kroondal and 11 km south-east of Rustenburg and falls within the Rustenburg Local Municipality of the North West Province. The current mining rights of LANXESS cover various portions of the farms Kroondal 304 JQ, Rietfontein 338 JQ and Klipfontein 300 JQ. The proposed mining activities will involve the authorisation of the proposed open pit mining operation on the farm Rietfontein 338 JQ (owned by the mine) and the proposed underground mining operations on portions of the farms Kroondal 304 JQ, Klipfontein 300 JQ and Brakspruit 299 JQ. Glencore Operations

[1] It should be noted that draft Regulations dealing with the financial provision for the closure of a mine and the calculation of the quantum of that provision are currently circulating for comment. These Regulations will have a significant impact on the provision for closure but this report is based on the Regulations applicable as at 1 December 2014.

South Africa (Pty) (Ltd) (formally known as Xstrata) currently holds the mining rights for some of these areas which are currently in the legal process of being transferred to Lanxess.

The following associated surface infrastructure will be constructed in support of the additional mining activities proposed for the site:

- Haul roads;
- Waste dump;
- Open pit and underground workings;
- Office and workshop; and
- Carport.

A list of areas which were accounted for in the closure cost estimate can be seen in Appendix A.

4 Expertise of the Specialist

The specialists involved in determining the environmental liabilities for LANXESS were Hlayiseko Mashaba and Renée Van Aardt. Their curricula vitae can be made available upon request.

5 Methodology

As mentioned above, the "*Guideline Document for the Evaluation of the Quantum of Closure-Related Financial Provision Provided by a Mine*" will be used to assess LANXESS closure liability. The DMR Guideline format makes use of a set template for which defined rates and multiplication factors are used. The multiplication and weighting factors which ultimately define the rate to be used are determined by amongst others the topography, the classification of the mine according to mineral mined, the risk class of the mine and its proximity to build up or urban areas.

The methodology described below details how the final closure liability was estimated for the expanded sections.

5.1 Infrastructure Measurement

The infrastructure and pit sizes were measured from plans provided by LANXESS. Measurements that were taken have been standardised to ensure that the costs calculated are easily updatable. An infrastructure plan used for the assessment is attached in Appendix A.

5.2 Rates

The DMR rates were published in 2005 and, due to inflation, are thus no longer accurate. As per the DMR's "Guideline Document for the Evaluation of the Quantum of Closure-related Financial Provision Provided by a Mine", the Master Rates for the DMR spreadsheet have

been updated based on new rates released by the DMR in 2012. An inflationary figure of 4.4% (CPI for January 2015) was then added to the 2014 rates to reflect the current 2015 rates.

5.3 DMR Classification

The DMR Guideline Document for the Evaluation of the Quantum of Closure Related Financial Provision Provided by a Mine (DME, 2005), classifies a mine according to a number of factors which allows one to determine the appropriate weighting factors to be used during the quantum calculation. The following factors are considered:

- The mineral mined;
- The risk class of the mine;
- Environmental sensitivity of the mining area;
- Type of mining operation; and
- Geographic location.

Once the risk class (Class A, B or C) and the sensitivity of the area where the mine is located (Low, Medium or High) had been determined using the appropriate tables (Table 1, Table 2, Table 3, Table 4 and Table 5) the unit rates for the applicable closure components were identified.

Table 1: Primary risk class for type of mineral mined (LANXESS's risk class highlighted in red)

Mineral	Ore	Size: large if > than (tpm)	Primary risk class			
			Large mine		Small mine	
			Mine and Mine waste	Mine, mine waste, plant and plant waste	Mine and Mine waste	Mine, mine waste, plant and plant waste
Antimony		1000	A	A	C	C
Asbestos		0	A	A	A	A
Base metals (Copper, Cadmium, Cobalt, Iron ore, Molybdenum, Nickel, Tin, Vanadium)	Sulphide	10 000	A	A	C	A
	Oxide	10 000	C	A	C	A
Coal		0	A	A	A	A
Chrome		10 000	C	A	C	C

Mineral	Ore	Size: large if > than (tpm)	Primary risk class			
			Large mine		Small mine	
			Mine and Mine waste	Mine, mine waste, plant and plant waste	Mine and Mine waste	Mine, mine waste, plant and plant waste
Diamonds and precious stones		10 000	C	B	C	C
Gold, silver, uranium		10 000	B	A	B	A
Phosphate		10 000	C	B	C	C
Platinum		10 000	C	B	C	B
Mineral sands (Ilmenite, Titanium, Rutile, Zircon)		10 000	C	B	C	C
Zinc and Lead		10 000	C	A	C	A
Industrial Minerals (Andalusite, Barite, Bauxite, Cryolite, Fluorspar)		10 000	C	C	C	C

Table 2: Criteria used to determine the area sensitivity

Sensitivity	Sensitivity criteria		
	Biophysical	Social	Economic
Low	• Largely disturbed from natural state, • Limited natural fauna and flora remains, • Exotic plant species evident, • Unplanned development,	• The local communities are not within sighting distance of the mining operation, • Lightly inhabited area (rural).	• The area is insensitive to development, • The area is not a major source of income to the local communities.

Sensitivity	Sensitivity criteria		
	Biophysical	**Social**	**Economic**
	• Water resources disturbed and impaired.		
Medium	• Mix of natural and exotic fauna and flora, • Development is a mix of disturbed and undisturbed areas, within an overall planned framework, • Water resources are well controlled.	• The local communities are in the proximity of the mining operation (within sighting distance), • Peri-urban area with density aligned with a development framework, • Area developed with an established infrastructure.	• The area has a balanced economic development where a degree of income for the local communities is derived from the area, • The economic activity could be influenced by indiscriminate development.
High	• Largely in natural state, • Vibrant fauna and flora, with species diversity and abundance matching the nature of the area, • Well planned development, • Area forms part of an overall ecological regime of conservation value, • Water resources emulate their original state.	• The local communities are in close proximity of the mining operation (on the boundary of the mine), • Densely inhabited area (urban/dense settlements), • Developed and well-established communities.	• The local communities derive the bulk of their income directly from the area, • The area is sensitive to development that could compromise the existing economic activity

Table 3: Weighting factor 1- Nature of terrain

	Flat	**Undulating**	**Rugged**
Weighting factor 1: **Nature of the terrain/ accessibility**	1.00	1.10	1.20

Note:

Flat - Generally flat over the mine area;

Undulating - A mix of sloped and undulating areas within the mine area; and

Rugged - Steep natural ground slopes (greater than 1:6) over the majority of the mine area.

Table 4: Weighting factor 2 - Proximity to urban area

	Urban	Peri-urban	Remote
Weighting factor 2: Proximity to urban area where goods and services are to be supplied	1.00	1.05	1.10

Note:

Urban - Within a developed urban area;

Peri-urban - Less than 150 km from a developed urban area; and

Remote - Greater than 150 km from a developed urban area.

The classification of Lanxess has been summarised in Table 5. It must be noted, however, that of the 18 closure components that exist only 3 are influenced by the risk class and sensitivity, the remaining 15 have a standard multiplication factor, irrespective of the class or sensitivity.

Table 5: Mine Classification

Mine	Risk Class	Sensitivity	Terrain	Proximity to Urban Area
Lanxess Mine	C	Medium	Flat	Peri-Urban

6 Assumptions

The assumptions for the project were as follows:

- The proposed infrastructure associated with the open pit will also be used for the underground workings;
- The proposed roads to be used by the mine will be the responsibility of LANXESS unless demonstrated otherwise;
- The Wonderkop Mine infrastructure have also been included in the assessment;
- This study did not include a detailed assessment long term decant from workings and its treatment costs;
- A contingency of 10% has been included to allow for unforeseen costs associated with contractors or rate increases;
- It was assumed that 2-3 years is adequate for the monitoring and maintaining of vegetation after rehabilitation; and

- For post-closure monitoring, costs of ground and surface water have been assumed to take place for a period of five years with sampling taking place on a quarterly basis.

7 Infrastructure and Rehabilitation

7.1 Steel Structures, Carport and workshop

All steel, carport and workshop need to be demolished to 1m below ground level. The remaining rubble may be buried adjacent to the building sites. Once the area is demolished the area needs to be covered with 300mm of topsoil and vegetated.

7.2 Open pit

The opencast, will start on the Eastern side of the proposed opencast area and progress towards the west. As the opencast mining progresses, the voids created will be backfilled with overburden from the progressive opencast mining, and then overlain by the various soil horizons and rehabilitated. There will be a final void at the end of life of mine and this will be filled with overburden material. The topography in the area adjacent to the void will be shaped to ensure that a free draining topography results.

Once the void has been backfilled, 300mm thick topsoil or soft overburden in place of soil will be spread on rehabilitated areas. Once placed, the “growth medium” should then be fertilised, ripped and re-vegetated. A small topsoil stockpile should be left for remedial work.

7.3 Waste Rock Dump (WRD)

It is recommended that the WRD be shaped to an 18° slope. It is assumed that covering the dumps with soil will not be necessary at closure unless the geochemical analysis indicates that there will be net acid generation from the WRD.

7.4 Sealing of Shaft

The most important aspect in sealing adit shafts is to ensure that the safety considerations associated with such a shaft are met. For the shaft to be sealed adequately, inert building rubble must be backfilled into the shaft, thereby partially plugging the shaft. The sealant is reinforced by a concrete cap, dimensions of which are governed by the size and nature of the shaft. After sealing the adit, the final area will be covered with, sub-soil and 150mm topsoil and vegetated. The possible formation of methane underground once the shaft has been sealed needs to be taken into account by placing venting boreholes strategically in the area.

7.5 Access Roads

Access roads around the site should be ripped for all areas except those needed to access the facilities for inspection after closure. Roads that can and will be used by other users post closure should, however, be left provided this is agreed upon by all parties concerned. For

the rehabilitation of roads, a cost has been allocated to rip the area, add 300 mm topsoil and vegetate.

7.6 Land Preparation, Fertilizing and Seeding

For all the disturbed and void areas that have been filled, top soiled and levelled, will now have to be prepared for planting.

The recommended approach, for which this costing has been derived, is as follows:

- Lime and superphosphate are applied to the surface;
- These ameliorants are then incorporated by deep ripping, which penetrated 100mm through the soil into the underlying overburden material;
- Compound (NPK + Zn) fertilizer is applied, and disced in as part of seedbed preparation;
- A grass seed mix is then planted, usually with first rains, or after rains have commenced; and
- The site is then mulched using locally obtained grass; this is to stimulate the long term establishment of indigenous vegetation and to reduce erosion during early plant growth.

7.7 Maintenance and Aftercare

Maintenance and aftercare must be planned for 2-3 years after the land preparation and replanting of vegetation has been completed.

Maintenance will specifically focus on fertilizing the rehabilitated area annually, control of wattle and all other alien plants and general maintenance, including rehabilitation of cracks, subsidence and erosion gullies. Continuous erosion monitoring of rehabilitated areas and slopes should be undertaken and zones with excessive erosion should be identified. The cause of the erosion should be identified, and rectified. Zones with erosion will need to be repaired with topsoil.

8 Long Term Water Issues

There is currently no conclusive data with regards to predictive model of groundwater plume and its associated environmental risk. This report has therefore not attempted to quantify the groundwater impacts or the mitigation thereof as these impacts and their mitigation cannot be accurately predicted without the availability of a detailed hydrogeological study.

9 Post Closure Management

The purpose of monitoring is to ensure that the objectives of the rehabilitation programme are met and that the progressive rehabilitation process is followed as planned during the life of the mine.

9.1 Groundwater and Surface Water

The quality of groundwater and surface water at the site should be monitored quarterly to ensure compliance of the various constituents with the standards. Samples should be analysed for particulate and soluble contaminants as well as biological. A hydrogeologist should determine the locations of the monitoring boreholes. The post-closure monitoring should take place for five years or until a long term acceptable trend can be determined.

9.2 Soil, Erosion and Subsidence Monitoring

Soil samples need to be taken annually at each area that has been rehabilitated to ensure a soil fertility supporting the final land use is attained during the 2-3 year monitoring and maintenance period.

9.3 Vegetation Monitoring

The following monitoring is recommended:

- Vegetation cover;
- Species composition;
- Erosion; and
- Alien invasive plants.

10 Summary of Liabilities

Closure liability costs were calculated by means of the DMR's standard method for assessment of mine closure. The closure liability only focused on the proposed mining activities and the cost for rehabilitation and closure of the proposed site according to the DMR Guideline format is R30 218 762. A summary of the calculated closure liability costs is presented in Table 6 below. A list of areas which were accounted for in the closure cost estimate can be seen in Appendix A.

The proposed mining right area extends to the Wonderkop Mine and the calculated closure cost associated with the existing mine infrastructure is estimated at R9 277 361. This estimate was previously approved by the DMR and the closure cost report compiled by JMA Consulting is attached in Appendix B. Lanxess has purchased the surface rights from Wonderkop and thus are liable for the existing infrastructure and therefore the estimate calculated by JMA will be combined with the estimate for proposed infrastructure. Therefore the total closure liability cost is R39 496 123.

Table 6: Closure liability for the expanded LANXESS Mine

	CALCULATION OF THE QUANTUM						
Applicant:	Lanxess Mine				Location:	Rustenburg	
Evaluator:	Digby Wells Environmental				Date:		
No.	Description	Unit	A Quantity	B Master Rate	C Multiplication factor	D Weighting factor 1	E=A*B*C*D Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and pow erlines)	m3	304	12.83	1	1	3 900.55
2 (A)	Demolition of steel buildings and structures	m2	9800	178.77	1	1	1 751 990.69
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	263.45	1	1	-
3	Rehabilitation of access roads	m2	161700	31.99	1	1	5 172 485.47
4 (A)	Demolition and rehabilitation of electrified railw ay lines	m	0	310.50	1	1	-
4 (B)	Demolition and rehabilitation of non-electrified railw ay lines	m	0	169.36	1	1	-
5	Demolition of housing and/or administration facilities	m2	0	357.54	1	1	-
6	Opencast rehabilitation including final voids and ramps	ha	9.6	187 427.98	0.52	1	935 640.49
7	Sealing of shafts adits and inclines	m3	448	95.97	1	1	42 996.76
8 (A)	Rehabilitation of overburden and spoils	ha	7	124 952.00	1	1	874 663.97
8 (B)	Rehabilitation of processing w aste deposits and evaporation ponds (non-polluting potential)	ha	62.71	155 625.44	1	1	9 759 271.12
8 (C)	Rehabilitation of processing w aste deposits and evaporation ponds (polluting potential)	ha	0	452 010.05	0.66	1	-
9	Rehabilitation of subsided areas	ha	0	104 628.47	1	1	-
10 (A)	General surface rehabilitation (w ith undesireable objects)	ha	0	98 983.05	1	1	-
10 (B)	General surface rehabilitation (no undesireable objects)	ha	0	40 900.98	1	1	-
11	River diversions	ha	0	98 983.05	1	1	-
12	Fencing	m	5640	112.91	1	1	636 804.50
13	Water management	ha	9.6	37 636.14	0.25	1	90 326.73
14	2 to 3 years of maintenance and aftercare	ha	99.06	13 172.65	1	1	1 304 882.62
15 (A)	Hydrogeological Studies	Sum	1	120 000.00	1	1	120 000.00
15 (B)	Specialist study	Sum	0			1	-
					Sub Total 1		20 692 962.92
1	Preliminary and General			2 607 313.33	weighting factor 2 1.05		21 727 611.06
2	Contingencies				2 172 761.11		2 172 761.11
					Subtotal 2		26 507 685.50
					VAT (14%)		3 711 075.97
					Grand Total		**30 218 761.47**

11 Recommendations

The recommendations, based on the site visit and compilation of the liability assessment are as follows:

- The liability figures need to be updated on an annual basis as a requirement by NEMA. This will ensure that all costs become more accurate over time and will reflect current market conditions;
- Concurrent rehabilitation must be conducted where possible so as to reduce the liability burden when the mine ceases to operate;
- The geochemical analysis for the WRD must be undertaken to determine if there will be potential groundwater pollution from the WRD at closure. If the results indicate that it contains inert rock, it can be used as aggregate material for activities like road construction. This will significantly assist in reducing the costs associated with the rehabilitation of the waste rock dump; and
- Hydrogeological studies should be conducted for proposed LANXESS Operation to define the post-closure influence of the mining on the groundwater quality of the surrounding areas.

Appendix A: Infrastructure Plan

Plan 4

Lanxess Chrome Mine S102 EMP Amendment

Proposed Opencast Infrastructure

27°21'0"E 27°22'0"E 27°23'0"E 27°24'0"E

25°43'0"S

25°44'0"S

25°45'0"S

BRAKSPRUIT

N4

Legend

- Mining Right Boundary
- 100 m Buffer of Mining Right Boundary
- Opencast Project Area
- Underground Mining Area
- Power Line
- Arterial / National Route
- Minor Road
- Railway Line
- Pipeline
- Non-Perennial Stream
- Dam Wall
- Dam / Lake

Proposed Infrastructure

- Access Road (5550 m)
- Conveyor (380 m)
- Fence (5640 m)
- Berm (8.73 ha)
- Haul Road (14.12 ha)
- High Wall (4.31 ha)
- Pit (48.09 ha)
- Site Office (0.98 ha)
- Topsoil Dump (17.33 ha)
- Waste Dump (62.71 ha)

DIGBY WELLS ENVIRONMENTAL

• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

Projection: Transverse Mercator	Ref #: scm.LAN3111.201502.047
Datum: WGS 1984	Revision Number: 4
Central Meridian: 27°E	Date: 03/06/2015

N

0 0.25 0.5 1

Kilometres

1:22 000

www.digbywells.com

© Digby Wells Environmental

Appendix B: Wonderkop Closure liability Report

JMA Consulting (Pty) Ltd

15 Vickers Street
Delmas
P O Box 883
Delmas, 2210
Tel (013) 665 1788
Fax (013) 665 2364

Sustainable Environmental Solutions through integrated Science and Engineering

JMA/30000/2014

17 February 2014

Glencore Operations South Africa (Pty) Ltd
Wonderkop Smelter
Marikana
Private Bag 82325
RUSTENBURG
0300

ENVIRONMENTAL BASELINE STUDY ("BASELINE") GLENCORE OPERATIONS SOUTH AFRICA (PTY) LTD ("GLENCORE") WONDERKOP MINE

1. INTRODUCTION

a) Mandate

Glencore Operations South Africa (Pty) Ltd ("Glencore") is in the process of concluding a transaction with the Lanxess Group in respect of its Wonderkop Mining Right. A condition precedent to the transaction is that the Parties agree the content of a Baseline Study in order to determine the Glencore environmental liabilities associated with the historical Glencore Operations at Wonderkop. The historical Glencore operations are defined as the *historical exploration and/or mining operations undertaken by Glencore in respect of the surface or beneath the Wonderkop Area as identified in the Baseline Study*. As such the smelting and associated operations conducted by Glencore at its Wonderkop Plant, are specifically excluded from the Baseline Study.

Glencore has accordingly requested JMA Consulting (Pty) Ltd (JMA) to attend to the Baseline Study as set out above. This study is based on the approach to indicate closure liability based the environmental baseline work performed as part of the EMPR Addendum and related formal applications completed by JMA in 2009- 2013.

b) Background

The Wonderkop Mine historically supplied ore material to the Wonderkop Smelter which commenced production during 1996. The Smelter Operations developed since and consists of six furnaces two Metal Extraction Plants a Pelletizing Plants and other related infrastructure.

The EMPR amendment was identified as the main vehicle to achieve the necessary goals of formal authorizations. This approach was discussed with the authorities; Department Minerals Resources (DMR) Department of Water Affairs (DWA) and the Department of Environmental Affairs (DEA) and

Directors: J.L. Müller M.Sc.(Pr.Sci.Nat.), J.J. van der Berg M.Sc.(Pr.Sci.Nat.), R. Grobbelaar M.Sc.(Pr.Sci.Nat.)

the North West Department of Economic Development Environment Conservation and Tourism (NW-DEDECT).

The Baseline Studies included in the integrated environmental assessment includes the following specialist investigations:

Materials and Process Characterization, Meteorology, Topography, Soils, Land Capability Land Use, Plant Life, Animal Life, Aquatic Eco-systems, Geology, Ground Water, Surface Water, Air Quality, Noise, Visual and Aesthetic Quality, Public Consultation, Archaeology, and Civil Engineering Designs of all new and upgrade of current facilities.

The main objectives for the baseline studies were to supply an accurate, quantitative description and understanding of the current environmental impacts related to Wonderkop Mine and Smelter activities, the possible future development of these impacts, and the risks these impacts hold for human health and the environment. This information was then used as the basis to determine the objectives and measures required to manage the environment, using a risk based approach.

2. SITE LAYOUT

The Wonderkop Operations site is situated in the North West Province and within the magisterial district of the Rustenburg Local Municipality. The following figure illustrates the site layout and historic activities related to the Wonderkop Mine Operations. These are the activities considered during the closure planning for the Wonderkop Operations.

Confidential. All rights reserved.

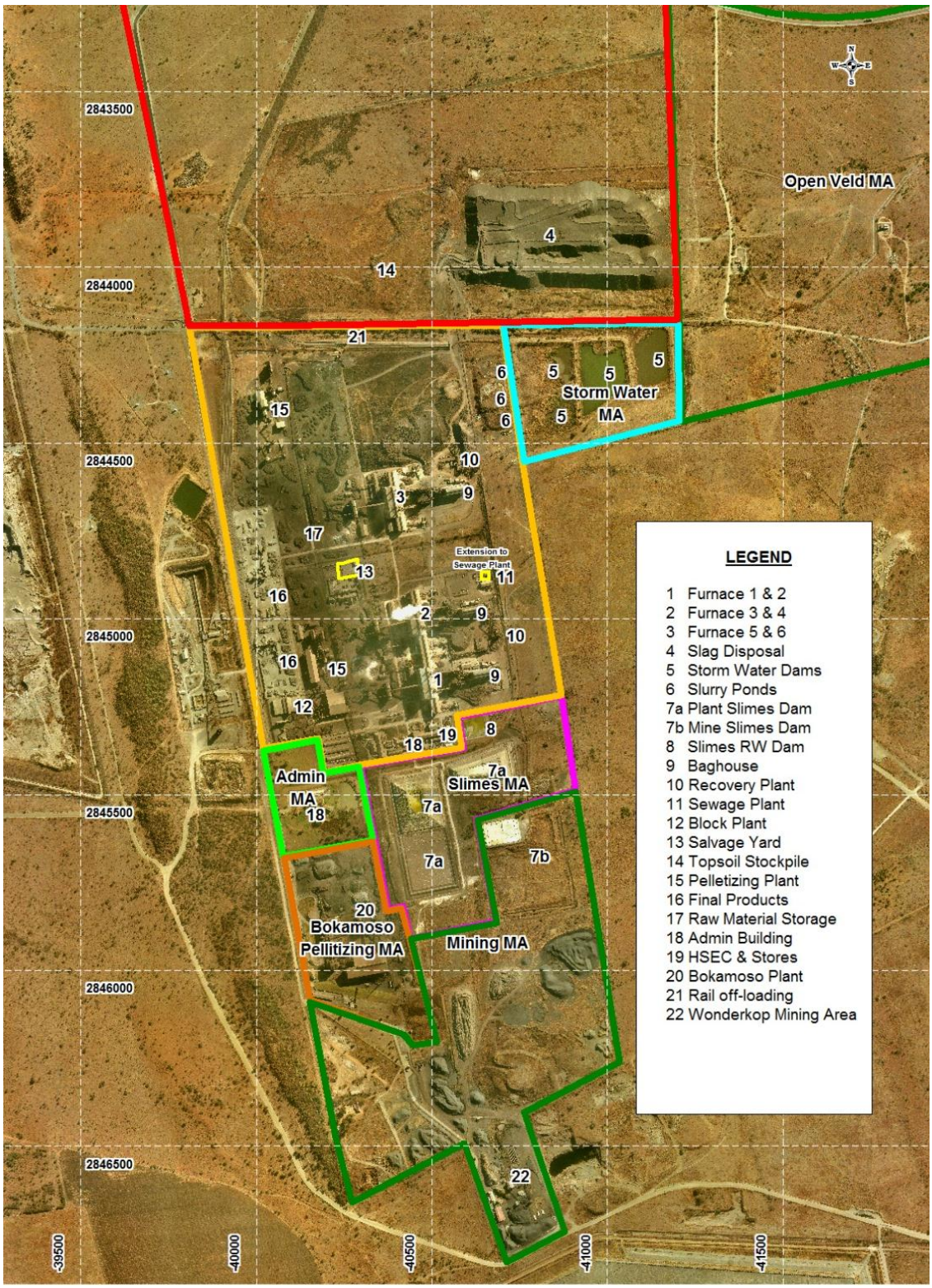


Figure 2(a): Site Layout Plan for the Wonderkop Operations.

3. SURFACE USEAGE DESCRIPTION

In terms of the transaction agreements entered into with Lanxess referred to in paragraph 1 (a) above, the *Wonderkop Area* is defined as consisting of Portion 1 of the Farm Spruitfontein 341 JQ and the

remainder portion, remaining portion of portion 12, portions 17, 18 and 19 (portions of portion 12) all of the Farm Brakspruit 299 JQ.

Graphically, all infrastructure and environmental impacts associated with historical exploration and/or mining operations undertaken by Glencore in respect of the surface at Wonderkop, is indicated in Figure 2 (a) above delineated in dark green outline.

However, with the exception of the access roads, raw material stockpiles and the mine slimes dam (which fall within the remainder of Farm Brakspruit 299 JQ and hence the definition of the *Wonderkop Area*), all other infrastructure associated with historical exploration and/or mining operations undertaken by Glencore, falls outside the surface area as defined in the *Wonderkop Area*, and fall within portion 16 of the Farm Spruitfontein 341 JQ.

It is therefore our view that only the raw material stockpiles and the mine slimes dam (which fall within the remainder of Farm Brakspruit 299 JQ) should form part of this Baseline together with Historical Underground mining operations as set out in Figure 4 (c) below. This needs to be discussed and agreed with Lanxess and/or its environmental consultants accordingly.

This notwithstanding, as further set out below, all items associated with historical exploration and/or mining operations undertaken by Glencore in respect of the surface and underground at Wonderkop, are detailed below, and in terms of all which financial provision for rehabilitation had been made by Glencore to the DMR as detailed in paragraph 5. This should provide further comfort to Lanxess.

4. SURFACE INFRASTRUCTURE

The mine management area covers a surface footprint of approximately 60 ha and includes all the mining related activities. Figures 4(a) indicates the Mine Management Area as its current activity inventory.

The existing inventory for the Mine Management Area (MA-1) is listed below:

- Access Roads
- Service Roads
- Main Security Gate at Mine Office
- Weigh Bridges
- Stockpile Area (UG 2 Raw Material)
- Historic Facilities (Water Holding Dams)
- Historic Slimes Dam Facility
- Mine Shaft Entrance (Mine in Care and Maintenance since 1998)
- Underground Mine (see Figure 4(c))
- Mine Offices
- Explosives Storage Facilities (inactive)
- Spiral Plant and associated facilities
- Old Farm House and infrastructure

Confidential. All rights reserved.

Figure 4(a): Mine Management Area (MA-1) – Existing activities.

Figure 4(b): Photo showing the Mine Plant Layout of MA-1.

The historical underground mining operations are set out in Figure 4 (c) below

The extent of the historic underground mining operations at Wonderkop is set out in figure 4(c), and provision for the sealing of shafts, adits and declines is set out in the closure liability report in paragraph 5 below.

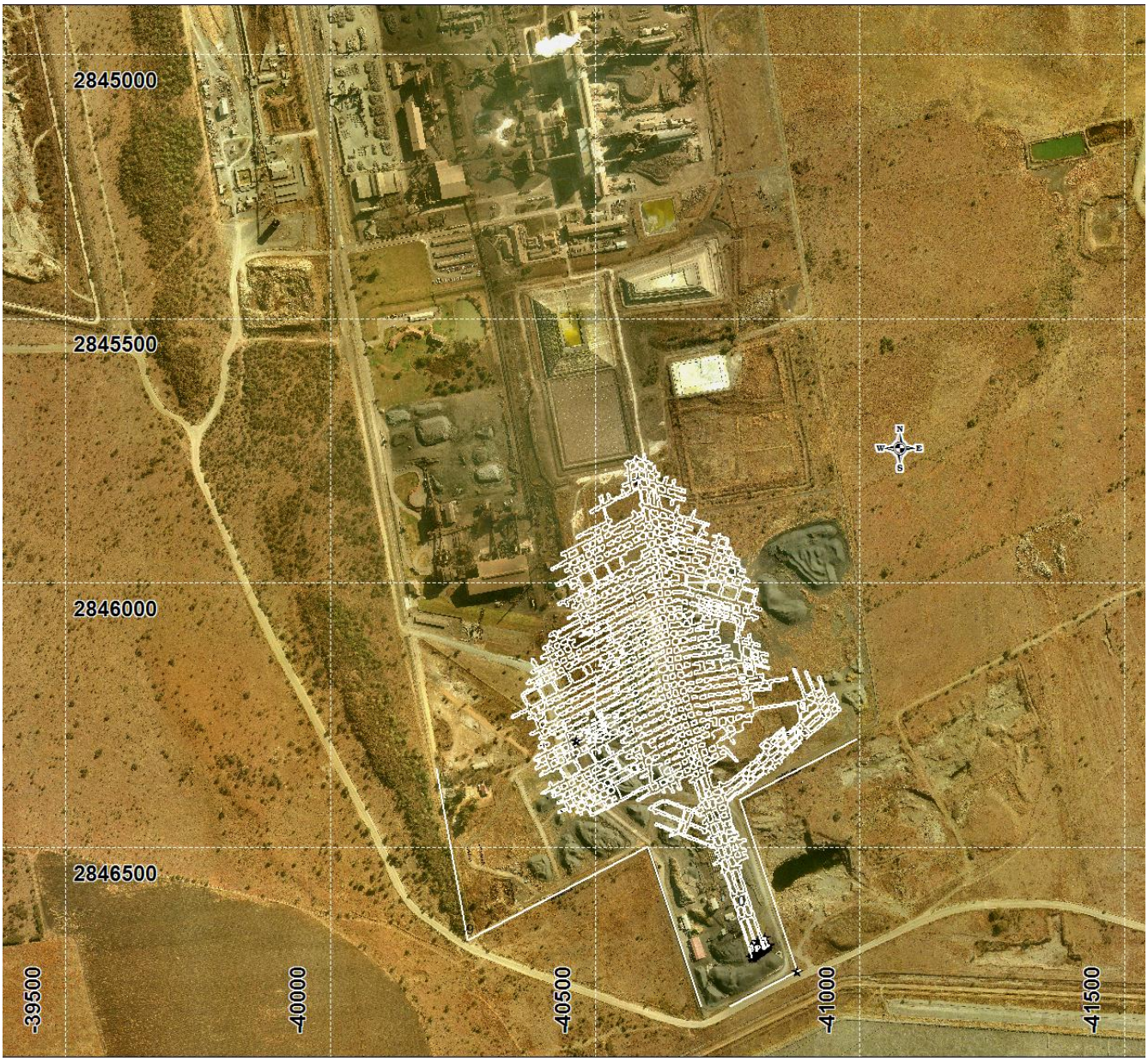


Figure 4(c): Mine Management Area (MA1) with the Underground Mine Layout.

5. CURRENT CLOSURE COST PROVISION

The current closure cost provision based on the DMR Quantum Guideline (2005), was calculated based on the entire surface activities and infrastructure as define on Figure 4(a) and the costs of the sealing of the existing shafts, adits and inclines (as depicted in figure 4 (c)). The current cost related to this can

be summarised below and are provided for as a part of the ZAR 160 million Nedbank guarantee # 31610706 dated 13 April 2012, as follows.

GLENCORE

REHABILITATION ESTIMATION COST

Mine:	GLENCORE MERAFE VENTURE - WONDERKOP OPERATION (Wonderkop Mine)			Location:		North West		
Evaluators:	JMA			Date:		Nov-13		
			A	B	C	D	E=A*B*C*D	
No	Description	Unit	Quantity	Master rate 2013	Multiplication factor	Weighting factor 1	Amount (Rand)	Dismantling	Rehabilitation
1	Dismantling of processing plant and related structures (Including overland conveyors and power lines)	m²	57857.00	R 11.57	1	1.1	R 736 185.06	R 736 185.06	
2(A)	Demolition of steel buildings and structures	m²	368.00	R 161.13	1	1.1	R 65 225.61	R 65 225.61	
2(B)	Demolition of reinforced concrete buildings and structures	m²	450.00	R 237.46	1	1.1	R 117 540.43	R 117 540.43	
3	Rehabilitation of access roads Including all haul roads	m	7000.00	R 28.83	1	1.1	R 222 020.81		R 222 020.81
4(A)	Demolition and rehabilitation of electrified railway lines	m	0.00	R 279.86	1	1.1			
4(B)	Demolition and rehabilitation of non-electrified railway lines	m²	0.00	R 152.65	1	1.1			
5	Demolition of housing and/or administration facilities	m²	500.00	R 322.26	1	1.1	R 177 243.50	R 177 243.50	
6	Opencast rehabilitation including final voids and ramps	ha	0.00	R 168 932.56	1	1.1			
7	Sealing of shafts, adits and inclines	m³	1500.00	R 86.50	1	1.1	R 142 727.66		R 142 727.66
8(A)	Rehabilitation of overburden and spoils	ha	0.00	R 112 621.71	1	1.1			
8(B)	Rehabilitation of processing waste deposits and evaporation ponds (basic, salt-producing waste)	ha	5.00	R 140 268.30	1	1.1	R 771 475.66		R 771 475.66
8(C)	Rehabilitation of processing waste deposits and evaporation ponds (acidic, metal-rich waste)	ha	0.00	R 407 405.64	1	1.1			
9	Rehabilitation of subsided areas	ha	0.00	R 94 303.72	1	1.1			
10	General surface rehabilitation	ha	30.00	R 89 215.39	1	1.1	R 2 944 107.83		R 2 944 107.83
11	River diversions	ha	0.00	R 89 215.39	1	1.1			
12	Fencing	m	2000.00	R 101.77	1	1.1	R 223 886.53	R 223 886.53	
13	Water management	ha	20.00	R 33 922.20	1	1.1	R 746 288.42		R 746 288.42
14	2 to 3 years of maintenance and aftercare	ha	20.00	R 11 872.77	1	1.1	R 261 200.95		R 261 200.95
15	Specialist studies	Sum	0.00	R 1.00	1	1.1			
						Sub Total 1	**R 6 407 902.45**	**R 1 320 081.12**	**R 5 087 821.33**
						Weighting factor 2	**R 320 395.12**	**R 66 004.06**	**R 254 391.07**
1	Preliminary and General	12 % of Sub Total 1					**R 768 948.29**	**R 158 409.73**	**R 610 538.56**
7	Contingency	10 % of Sub Total 1					**R 640 790.25**	**R 132 008.11**	**R 508 782.13**
						Sub Total 3	**R 8 138 036.12**	**R 1 676 503.03**	**R 6 461 533.09**
						VAT (14%)	**R 1 139 325.06**	**R 234 710.42**	**R 904 614.63**
						Grand Total	**R 9 277 361.17**	**R 1 911 213.45**	**R 7 366 147.72**

Confidential. All rights reserved.

6. CONCLUSION

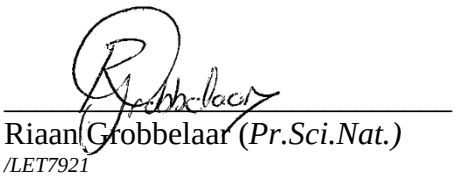
Glencore requested JMA Consulting (Pty) Ltd (JMA) to indicate the extent of the Glencore environmental liabilities associated with the historical Glencore Operations at Wonderkop. It is our view that the Glencore environmental liabilities consist only of the access roads, raw material stockpiles and the mine slimes dam (which fall within the remainder of Farm Brakspruit 299 JQ) and the historic underground mining operations indicated in Figure 4 (c).

All mining rehabilitation obligations in, on or under the *Wonderkop Area* are already included in the rehabilitation estimation provided to DMR, and are secured in term of the provisions of the Nedbank Guarantee ("Guarantee") provided to DMR in respect of the total Wonderkop Smelter and Mine. This Guarantee will remain for as long as the Guarantee remains in force, and remain unaltered, providing Lanxess further comfort.

A final point is that there is certain water intrusion in the historical underground workings. This water is currently pumped by Glencore to supply process water to the smelting operations. It is understood that Lanxess does not intend to access these historical workings, but should this be required, Lanxess will have to apply to the authorities for the necessary authorizations should it wish to continue the workings.

Should you have any enquires or require clarification on any matter pertaining to our submission, please do not hesitate to contact us.

Respectfully submitted



Riaan Grobbelaar (*Pr.Sci.Nat.)*
/LET7921