Draft Scoping Report for the Proposed new Tailings Storage Facilities (TD8, TD9) and Associated Infrastructure at Lonmin's Western Platinum Mine (WPL) and Eastern Platinum Mine (EPL)

Report Prepared for

Lonmin Platinum Mines (Pty) Ltd

Report Number 436739/DSR01

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Report Prepared by

srk consulting

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Executive Summary

Introduction

Lonmin Platinum Mine operates as Western Platinum Limited (WPL) and Eastern Platinum Limited (EPL). Lonmin is listed on the London Stock Exchange and is a constituent of the FTSE 250 Index. Current tailings storage capacity at the central and eastern operations is reaching its maximum capacity within the central mining area and two new tailings storage facilities or tailings storage facilities (TD) are planned to alleviate long term demand for this area. SRK Consulting (Pty) Ltd (SRK) has been appointed as independent Environmental Assessment Practitioners (EAP) to carry out the Environmental Impact Assessment (EIA) and Amendment of the Environmental Management Plan (EMP) in accordance with the National Environmental Management Act (NEMA; Act No. 107 of 1998) and the Mineral and Petroleum Resources Development Act (MPRDA; Act No. 28 of 2002). In addition, an amendment of the mine's Integrated Water Use License will be submitted in terms of the National Water Act, Act 36 of 1998.

An application for the NEMA EIA authorisation has been submitted to the competent authority, the North West Department of Economic Development, Environment Conservation and Tourism (DEDECT) and has been allocated the reference number NWP/EIA/08/2012.

Project background

WPL and EPL are located in the Bojanala Platinum District of the North West province, some 10km to the north of the Magaliesburg and to the immediate north of the National road (N4) between Pretoria and Rustenburg. Pretoria and Brits lie to the east of Lonmin, Pretoria being about 70km and Brits 30km from the mine. Rustenburg lies approximately 50km to the west of the mine.

WPL includes Western Platinum Mine (WPM), Karee Mine (KM), and the Process Division which consists of a concentrator, smelter and base metals refinery (BMR) located in Bojanala District Municipality. Although underground mining predominates at WPL, opencast mining is being undertaken on the mine and is scheduled to continue over the next few years.

The proposed TD8 and TD9 project with associated infrastructure is essential for the continued operations at Lonmin Western Platinum Limited (WPL) and Eastern Platinum Limited (EPL), and will be located within the WPL mining rights area.

WPL is the registered owner of the rights to precious metals and base minerals with respect to the portions of the farms Rooikoppies 297JQ, Zwartkoppies 296JQ, Brakspruit 299JQ, Schaapkraal 292JQ, Middelkraal 466JQ, Elandsdrift 467JQ and Kafferskraal 292JQ. The two tailings storage facilities and infrastructure described in this Draft Scoping Report (DSR) are located on Farm: Middelkraal 466JQ. Pipelines run within the Middelkraal 466JQ farm portions and Turfontein 452JQ farm portions.

Project description

WPL is currently mining both the Merensky and UG2 Reefs.

Storage at the current tailings storage facilities within the central mining area and eastern operations are reaching capacity and thus two tailings storage facilities are proposed to alleviate long term demand. The proposed tailings storage facility (TD) 8 is planned to the south of current TD6 while

the proposed TD9 is planned to be south of TD8 beyond an existing mine service road and railway line.

The following infrastructure is proposed:

- A new tailings storage facility TD8;
- A new tailings storage facility TD9.
- A number of pipelines will also be constructed or upgraded in order to service the tailings storage facilities. The proposed pipelines will consist of the following:
    1. Upgrading and expansion of existing pipelines from the Rowland Concentrator to proposed TD8;
    2. New pipeline will be constructed from UG2 Concentrator to Rowland Concentrator;
    3. New pipeline will be constructed from EPL TD2 Concentrator to the proposed TD8; and
    4. New pipeline from EPL TD2 to WPL UG2 Concentrator.
- Service roads will be built along all pipelines in order for the mine to be able to service them and service roads will be constructed around the proposed tailings storage facilities in order to service them;
- A pump station will be built to service the pipeline from EPL TD2 to the proposed TD8;
- A railway crossing may be constructed for pipelines and roads for pipelines running between EPL TD2 and WPL UG2;
- A river crossing may be necessary for some of the pipelines and service roads;
- A river diversion will also be constructed for the Maretlwanespruit, located to the south of the proposed TD8; and
- An existing return water dam at TD6 will be re-lined and expanded as part of the project to meet DWA requirements.

The proposed developments will be located on mine owned property, although the site for the proposed TD8 is informally used for communal grazing.

Lonmin wishes to develop the proposed tailings storage facilities in a phased approach, commencing with TD8 first, and followed by the proposed TD9.

Existing labour forces will be utilised during the construction and operation phases since this is an expansion project.

Alternatives

Various options were investigated by Lonmin with respect to the site for the proposed tailings. The proposed site was selected due to space requirements, stability of underlying geology and the location of existing infrastructure, and to limit the impact on heritage resources and biodiversity hotspot areas (such as koppies).

Key environmental sensitivities of the area

Environmentally sensitive aspects include:

- **Cultural heritage:** There are sites of interest in the area which must be taken into consideration during construction and either avoided, protective strategies must be put in place or these must be properly documented and relocated in terms of the National Heritage Resources Act, Act 25 of 1999.
- **Land use:** The predominant land use in the area is informal agriculture, consisting of natural vegetation used for communal grazing.
- **Fauna and flora:** The proposed tailings storage facilities and associated infrastructure occur on areas disturbed by agriculture and mining activities. However, red data species are known to occur in the greater Marikana area. The presence of any sensitive species will be confirmed by specialists during this EIA process.
- **Stream diversion:** The local stream to be diverted for the proposed tailings storage facilities may have sensitive aquatic species and habitats. The presence of any sensitive species will be confirmed by specialists during this EIA process.
- **Dust:** Dust is a predominant issue with tailing storage facilities and the potential impact of dust will be confirmed by specialists during this EIA process.
- **Ground and surface water:** Potential seepage from the proposed tailings storage facilities and associated infrastructure may lead to surface and ground water impacts. These will be investigated by specialists during the EIA process.

Plan of study for the EIA and EMP

Scope of Specialist Studies

A framework for the plan of study for the EIA and EMP covers the following:

- Public consultation: This will involve review of the Draft EIA and EMP report;
- Specialist studies: Specialist studies include air quality, surface water, ground water, soils (geotechnical studies), biodiversity, and heritage resources; and
- Compilation of the Draft EIA and EMP reports.

Both the MPRDA and the NEMA EIA regulations require an assessment of the cumulative impacts and these will be assessed where possible by the above specialist studies.

Conclusion

The Draft Scoping Report will be updated after the public review period, with all comments received, and will be submitted to the authorities for approval.

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Disclaimer

The opinions expressed in this Report have been based on the information supplied to SRK Consulting (South Africa) (Pty) Ltd (SRK) by Lonmin Platinum Mine (Pty) Ltd (Lonmin). SRK has exercised all due care in reviewing the supplied information. Whilst SRK has compared key supplied data with expected values, the accuracy of the results and conclusions from the review are entirely reliant on the accuracy and completeness of the supplied data. SRK does not accept responsibility for any errors or omissions in the supplied information and does not accept any consequential liability arising from commercial decisions or actions resulting from them. Opinions presented in this report apply to the site conditions and features as they existed at the time of SRK's investigations, and those reasonably foreseeable. These opinions do not necessarily apply to conditions and features that may arise after the date of this Report, about which SRK had no prior knowledge nor had the opportunity to evaluate.

List of Abbreviations

BID	Background Information Document
CRR	Comments and response report
DEDECT	Department of Economic Development, Environment, Conservation and Tourism
DMR	Department of Mineral Resources
DSR	Draft Scoping Report
DWA	Department of Water Affairs
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMPr	Environmental Management Programme report
EPL	Eastern Platinum Limited
FSR	Final Scoping Report
GLC	Greater Lonmin Community
I&APs	Interested and Affected Parties
IWUL	Integrated Water Use Licence
IWWMP	Integrated Water and Waste Management Plan
Lonmin	Lonmin Platinum Mine
LOM	Life of Mine
mamsl	mean average metres above sea level
MAR	Mean Annual Runoff
mbgl	metres below ground level
MPRDA	Mineral and Petroleum Resources Development Act (Act No. 28 of 2002)
mtpa	million tonnes per annum
MVA	Mega Volt-Ampere (measure of electricity usage)
NEMA	National Environmental Management Act (Act No. 107 of 1998)
NEMAQA	National Environmental Management Air Quality Act (Act No. 39 of 2004)
NEMBA	National Environmental Management Biodiversity Act (Act 10 of 2004)
NEMWA	National Environmental Management Waste Act (Act No. 59 of 2008)
NWA	National Water Act (Act No. 36 of 1998)
ROM	Run of mine
SANBI	South African National Biodiversity Institute
SRK	SRK Consulting
TD	Tailings storage facility
WHO	World Health Organisation
WPL	Western Platinum Limited
WULA	Water Use Licence Application

1 Introduction

1.1 Purpose of this report

The Draft Scoping Report (DSR) sets out the proposed scope of the Environmental Impact Assessment (EIA) and Amendment of the Environmental Management Programme (EMP) that will be undertaken for the proposed tailings storage facilities TD8, TD9 and associated infrastructure at Lonmin's EPL and WPL operations. This includes a project description, alternatives that were evaluated for various aspects of the projects, all environmental impacts and issues that will be addressed, terms of reference of the specialist studies to be undertaken, qualifications and experience of the study team and the public consultation process.

The DSR is available for public review and will be updated with all comments received and submitted to the authorities for approval at the end of the public review period.

1.2 Guidelines

The following guidelines were consulted in the compilation of this report:

- Department of Environmental Affairs Guideline 3: General Guide to the Environmental Impact Assessment Regulations
- Department of Environmental Affairs Guideline 4: Public Participation
- National Environmental Management Act 107 of 1998 Environmental Impact Assessment Regulations, 2010, specifically Chapter 3 Application for Environmental Authorisation Part 3: Application subject to scoping and environmental impact reporting and Chapter 6 Public Participation Process
- Department of Mineral Resources Guideline for the compilation of a scoping report with due regard to consultation with communities and interested and affected parties as required in terms of sections 10(1)(b), 22(4)(b), and 30, read together with regulation 49 (2) of the Mineral and Petroleum Resources Development Act (Act 28 of 2002).
- Department of Mineral Resources Guideline for consultation with communities and interested and affected parties as required in terms of sections 10(1)(b), 16(4)(b), 22(4)(b), 27(5)(b) and 39 of the Mineral and Petroleum Resources Development Act (Act 28 of 2002).
- Environmental Implementation Plan (EIP) for the North West Province, GN 118, 10 April 2003 as required in terms of Section 11 of the National Environmental management Act, 1998 (Act No. 107 of 1998). First edition from September 2001.

The Lonmin Charter and Lonmin's Safety and Sustainable Development Policy also applies (see Appendix A).

1.3 Need and desirability

(As per the National Environmental Management Act (NEMA) Act 107 of 1998 and the EIA Regulations R543, June 2010, Regulation 28 (i))

Lonmin has underground and opencast mining operations that produce approximately13 million tons of ore containing platinum group metals (PGMs) and associated minerals per annum. The ore is taken to their processing plants at EPL and WPL where it is crushed and concentrated. The concentrate, containing the platinum metal, is treated at the smelter at WPL to produce PGMs and associated minerals. The largest waste stream from the concentrating process is called tailings. Tailings is the crushed material that remains after valuable minerals have been removed. Lonmin

produces in excess of 12 million tons of tailings per annum. Some of the tailings is further treated to remove chromite for chromium production. Waste tailings is deposited onto tailings storage facilities for safe, long term storage.

Current storage capacity of tailings in the central and eastern mining right area is expected to be insufficient for current tailings from 2018. Two new tailings storage facilities are planned in order for the mine to continue operating in the long term. Lonmin is the current owner of the land where the proposed two new tailings storage facilities will be located.

The benefits of the two new tailings storage facilities and proposed infrastructure include:

- Preservation of existing jobs by ensuring mining operations continues in the long term; and
- Ensuring continued platinum supply of sufficient quality. This is of strategic importance to South Africa's economic security and ensures economic development.

Potential negative impacts that must be addressed in the design, operation and maintenance of the proposed tailings storage facilities are:

- Impacts on cultural heritage as there are potentially sites of interest adjacent to the area of the proposed tailings storage facilities;
- Stream diversion;
- Dust generation;
- Loss of biodiversity; and
- Impacts on ground water and surface water from the tailings storage facilities and return water dam.

1.4 Environmental project team

1.4.1 Environmental assessment practitioner (EAP) team

SRK Consulting (Pty) Ltd (SRK), as an independent Environmental Assessment Practitioner (EAP), has been appointed by Lonmin to carry out the Environmental Impact Assessment (EIA), compile the Environmental Management Plan (EMP) and undertake a public participation process. These will be carried out in accordance with the Mineral and Petroleum Resources Development Act (MPRDA; Act No. 28 of 2002) to be submitted to the Department of Mineral Resources (DMR) and the National Environmental Management Act (NEMA; Act No. 107 of 1998) to be submitted to the North West Department of Economic Development, Environment and Tourism (NWDEDECT).

The study is being undertaken by SRK's Johannesburg Office. SRK commenced its practice in 1974 and has been involved in a large number of environmental studies since that time. A list of recent project experience is attached in Appendix B. The project team consists of the following members:

Table 1-1: EAP Project Team

Name	Designation	Role	Qualifications
Mr Darryll Kilian	Partner	Project review, QA	MA (EGS), CEAPSA, MSAIEES
Dr Jenny Lancaster	Project Manager	Project management and client liaison	PhD, Pr. Sci. Nat
Mrs Prav Sewmohan	Technical reviewer	Project management and client liaison	BScEng(Chem)
Elin Heinerud	Environmental Scientist	Project Co-ordinator; report compilation; stakeholder engagement	MA
Elna De Beer	Social Scientist, Senior Stakeholder Engagement Specialist	Stakeholder Engagement Review	BA (Social Work); IAP Theta
Shannon Du Plessis	Stakeholder Engagement Consultant	Public Participation co-ordinator	

Curricula Vitae of the team members listed above can be found in Appendix C.

1.4.2 Environmental Assessment Practitioner (EAP) Contact Details

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1.4.3 Amendment of the integrated Water Use Licence

An amendment to the integrated water use license (IWUL) issued in 2012 will be submitted in terms of the relevant Section 21 water uses identified in the National Water Act (NWA), Act No. 36 of 1998 for submission to the Department of Water Affairs (DWA) by Alta van Dyk, a consultant appointed by Lonmin. The mine's integrated water and waste management plan (IWWMP) must be updated annually and this proposed project will be included in the next update.

1.4.4 Specialists

Lonmin has appointed specialists based on specific experience and knowledge of the area, to undertake specialist studies for the EIA. The specialists appointed are as follows:

Table 1-2: Proposed specialist Team

Specialist Field	Name	Company	Qualifications
Air Quality	Prof. Mark Zunckel	uMoya-NILU Consulting	PhD
Biodiversity	Renee van Aardt Sanet Nissen Dieter Kassier (Ecologist) Bhuti Dlamini (Agricultural Engineer/wetland specialist) David Horne (Ecologist) Norma Sharratt (Aquatic ecologist)	Agreenco Wetland Consulting Services	Various
Heritage	Julius Pistorius		PhD
Ground water	C.F Delport (previous work) Fanie Botha	SRK Consulting Praxos 741	 (PhD/MSc) *Pr.Sci.Nat*
Surface water	Fanie Botha	Praxos 741	(PhD/MSc) *Pr.Sci.Nat*
Feasibility study	Nicolaas Hamman	SRK Consulting	B.Tech, Pr. Tech Eng

1.5 Competent authorities

As per the NEMA EIA Regulations, the NWDEDECT is the competent authority and Ms Delta Mahlaku has been assigned as the case officer. Approval of an amendment to the mine's EMP is also needed from the DMR in terms of the Mineral Petroleum Resources Development Act (MPRDA) and Mr Desmond (Percy) Makamu is the assigned case officer. The amendment to the IWUL will be submitted to the DWA.

1.5.1 Commenting authorities

The project falls within the Madibeng Local Municipality and is adjacent to the Rustenburg Local Municipality. These municipalities fall within the Bojanala District Municipality. Local ward councillors and traditional leaders will comment on the EIA and EMP Amendment.

1.6 Proponent team

The project proponent is Lonmin Plc (WPL and EPL). Lonmin has appointed the following management team to undertake this project:

Table 1-3: Project Proponent team

Name	Role	Association
Selwyn Green	Senior Manager Metallurgy (represents Lonmin as owner)	Lonmin
Hazel Fiehn	Land and Waste Specialist	Lonmin
Mandy Jubileus	Environmental Specialist	Lonmin
Gareth Smith	Project Manager for Lonmin	Lonmin

In addition, support is provided by other departments and members of the Lonmin project team.

2 Project description

(As per NEMA Act 107 of 1998 and R543, June 2010, Regulation 28 (d))

2.1 Project background

The use of PGMs produced as part of platinum mining operations spreads over a vast array of products such as catalytic converters in emission control equipment for which platinum, palladium and rhodium are used. The largest application for platinum catalysts is used in the production of silicones, followed by paraxylene production (Creamer, 2006). Other uses include autocatalysis (such as three-way catalyst (TWC) compositions which employ platinum, palladium and/or rhodium in an arrangement of combinations for the abatement of emissions from petrol/rich-bur engines), jewellery, electrical and electronics (hard disks, video recorders, MP3 music players), glass (glassware, liquid crystal display for flat-screen computer monitors and televisions), medical (drugs including the treatment of cancer), automotive (sparks plugs, oxygen sensors), fertilisers and in chemical and petroleum refining industries.

Platinum mining involves exploration, mining, concentrating, smelting, base metals extraction and refining of ore obtained from the UG2 and Merensky reefs as outlined below.

Exploration

Merensky and UG2 Chromotite reserves are determined and demarcated for mining within the western limb of the Bushveld Complex, by the drilling of exploration boreholes.

Mining

Both underground and opencast mining methods are used to extract the UG2 and Merensky reefs. The ore is then broken and transported to the surface by shafts (consisting of both vertical and incline orientated shafts) from underground operations and by conveyor or haul trucks from opencast operations. Waste rock is transported to waste rock dumps.

Concentrating

The ore from the mining process is sent to concentrators where it is milled and crushed. The crushed ore undergoes flotation to recover the ore particles containing PGMs and other minerals (this is called the concentrate). The waste crushed ore is disposed of as tailings.

Smelting and Base Metal Extraction

The concentrate is exposed to high temperatures at the smelter and BMR. This process generates converter matte which is then treated to produce nickel sulphates crystals, copper cathodes and PGM concentrate.

Refining

PGM concentrate from smelter and BMR is air freighted to the Western Platinum Refinery in Gauteng Province near Brakpan/Springs for further refining to finished metals (PGMs) for the market.

Tailings storage facilities

Tailings is used to describe the waste product derived from the concentrator process and is deposited in tailings storage facilities of which WPL and EPL have both active and decommissioned tailings storage facilities on site. Tailings is transported as a slurry to the tailings storage facilities in pipelines. Excess water from the tailings storage facility is collected in a return water dam. This water is pumped back to the concentrators for re-use.

Ancillary infrastructure

There are also numerous infrastructural and service elements associated with the mining and processing areas including landfill sites, sewage plants, workshops and stores, hostels, road networks and other service and maintenance infrastructural networks.

2.2 Location

The proposed Lonmin Plc EPL and WPL project is situated approximately 4km south east of Wonderkop, some 10km to the north of Magaliesburg and to the immediate north of the National road (N4) between Pretoria and Rustenburg. Pretoria and Brits lie to the east of Lonmin, Pretoria being about 70km and Brits 30km from the mine. Rustenburg lies approximately 50km to the west of the mine. The proposed project is located in the Madibeng Local Municipality area and falls within the Bojanala District Municipality. TD6 is located about 2km from the Wonderkop Township and about 4km from the Segwaelane Township, see Figure 2-6.

The proposed tailings storage facility TD8 is planned to adjoin the south of the existing TD6 while the proposed TD9 is planned to be south of TD8 beyond an existing mine road and railway line, on farm Middelkraal 466JQ portions: RE24, RE26, RE46, RE69, RE45, RE58, RE60, RE63, RE43, RE44, RE51, RE9, RE50, RE56, RE37, and RE2 and Turfontein 462 JQ portion 1.

A service road and pump station will be constructed to facilitate the maintenance of the pipelines along the route of the pipelines.

2.3 Proposed infrastructure

The following infrastructure is proposed by Lonmin:

2.3.1 Tailings storage facility

There will be two new tailings storage facilities, namely:

- Tailings storage facility TD8, with a design capacity of 3 250 000 tonnes per annum (tpa) during its life; and
- Tailings storage facility TD9 with a design capacity of 1 500 000 tons per annum.

Lonmin wishes to develop the proposed tailings storage facilities in a phased approach, TD8 followed by the proposed

2.3.2 Pipelines

A number of pipelines will also be constructed or upgraded in order to service the tailings storage facilities. The proposed pipelines consist of the following:

1. Upgrading and expansion of existing pipelines from the Rowland Concentrator to proposed TD8 (with a diameter of 200mm and approximately 4Km in length);
2. Construction of new pipeline from UG2 Concentrator to Rowland Concentrator (with a diameter of 200mm and approximately 4Km in length);
3. Construction of a new pipeline from EPL TD2 to proposed TD8 (with a diameter of 200mm and approximately 2Km in length);
4. Construction of a new pipeline from EPL TD2 to WPL UG2 Concentrator (with a diameter of 300mm and approximately 10km in length).

Although there is a preferred route option for each pipeline, the exact position of the pipeline will be confirmed in the EIA process and although every effort will be made to stay out of the 1:100 year

floodline and 32m boundary of a watercourse, this may not be possible. The pipeline will cross the proposed stream diversion.

2.3.3 Service roads

Service roads (6m wide) will be built along the pipelines and around the proposed tailings storage facilities in order for the mine to service them and will cross the proposed stream diversion and existing rail and road.

2.3.4 Pump station

A new pump station will be required for the pipeline from EPL TD2 to proposed TD8 as indicated in Figure 2-6. The pump station is located adjacent to existing infrastructure for easy access for maintenance.

2.3.5 River crossings

A river crossing will be necessary for some of the pipelines and service roads to the south of TD8. This is being confirmed in the design process and more detail will be included in the EIA report later in the process.

2.3.6 River diversion

A non-perennial stream to the south of TD6 will be diverted around the proposed TD8 to the south of the proposed TD9 facility. More detail will be provided in the EIA report later in the process.

2.3.7 Return water dam

The run off from the proposed TD8 and TD9 is planned to report to an existing return water dam. The existing return water dam will be relined and extended to comply with Department of Water affairs (DWA) requirements for the containment of contaminated water. Water from the dam will be pumped back to the WPL concentrators via an existing pipeline.

2.4 Tailings deposition methodology

Tailings from both EPL and WPL will be pumped via the new pipelines to the proposed new TD8 and TD9. In each tailings storage facility, tailings will be pumped onto the edge of the dam crest and then distributed through a distribution line along the perimeter of the crest. The tailings will be deposited through a spigot pipeline with spigots located at intervals along the pipeline. The spigots will be opened as required and the coarser material in the tailings will settle closer to the outer edge while the finer particles will migrate with the water towards the centre. The water collects in a central pool and is then drain via the penstock system. As the tailings is deposited, the tailings consolidates and dries out, thus layer upon layer will build up. Over time, the height of the dam will increase.

In order to ensure safe slopes along the outside wall, the overall outer slope will be constructed at a 1 in 3.5 slope with step-ins at 7 m intervals. The slopes are specifically designed based on the characteristics of the tailings to allow for a stable wall. The short slopes between the step-ins allow erosion to be minimised and better establishment of vegetation on the slopes. The maximum height of the tailings storage facility, from the lowest point, will be 60 metres (see Figure 2-1 and Figure 2-3).

Construction and site preparation

Construction and site preparation involves clearing of vegetation, grading of the site area to specific levels and topsoil removal that is stockpiled for rehabilitation. An 8m high starter wall will be constructed along the lower perimeter of the dams, to cater for the initial high rate of rise during

deposition, while the rest of the dam perimeter will be contained with a low toe wall. The starter wall and toe wall is typically constructed from an approved, available, in-situ material, e.g. norite clay. When the tailings height rises above the starter wall crest, the upstream construction method is utilized where wall building is done with dry tailings on top of the existing deposited dry tailings that has gained sufficient strength to be built on (see Figure 2-2).

Water management

An under-drainage network and main decanting infrastructure will be constructed that will drain to a return water dam. The under-drainage networks assist in lowering the phreatic surface (mound of water within the dam) by draining excess seepage water into a solution trench that will run along the perimeter of the dam footprint. A decanting structure will remove excess water from the top of the dam by means of a central penstock. In addition, water management infrastructure such as storm water cut-off trenches and berms around the footprint will be installed to prevent any clean water from the surrounding area from entering the tailings footprint (see Figure 2-1). The solution trench and penstocks drain to the return water dam, from where water is pumped back to the concentrators.

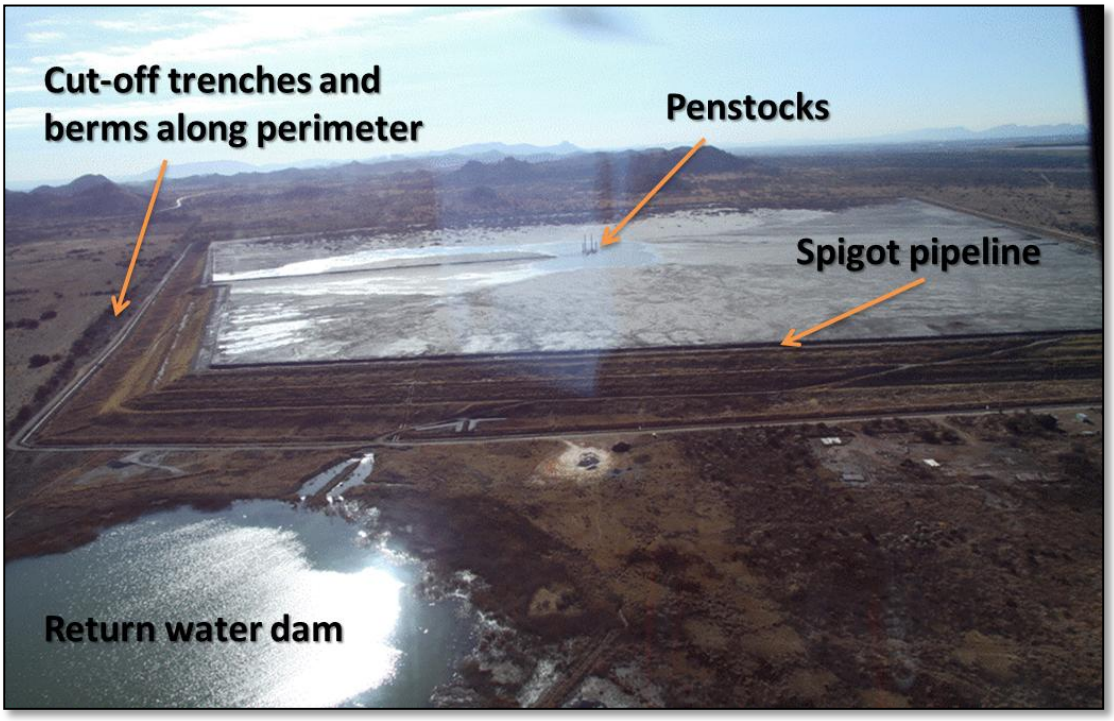

Figure 2-1: Water collection of tailings storage facility

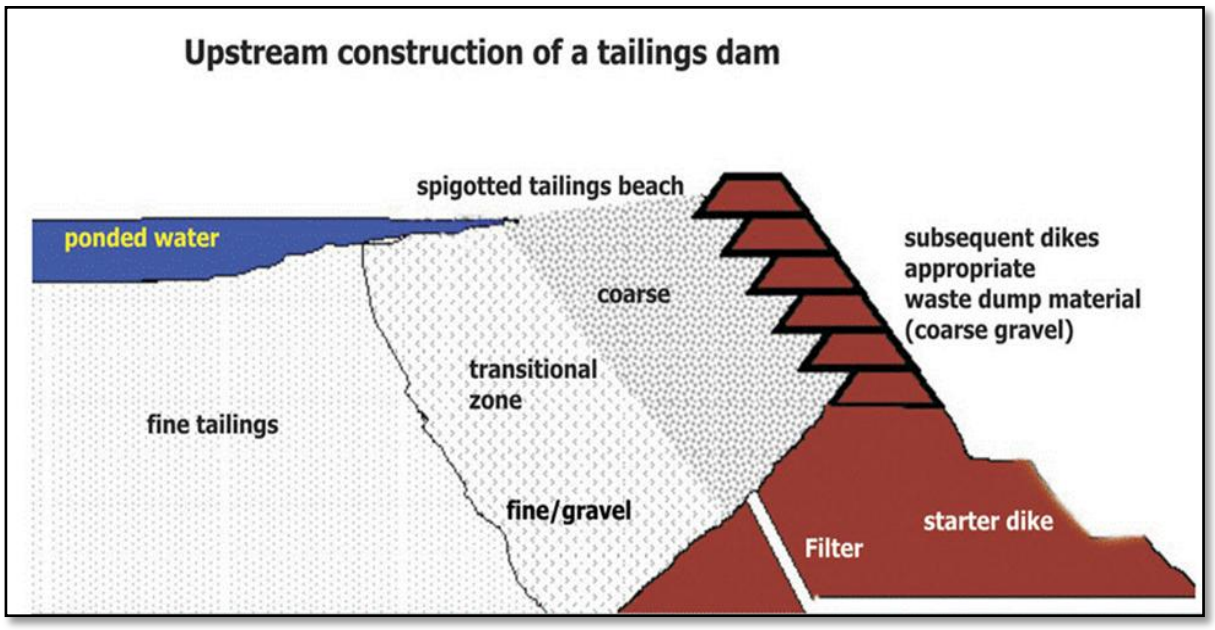

Figure 2-2: Upstream construction of a Tailings storage facility

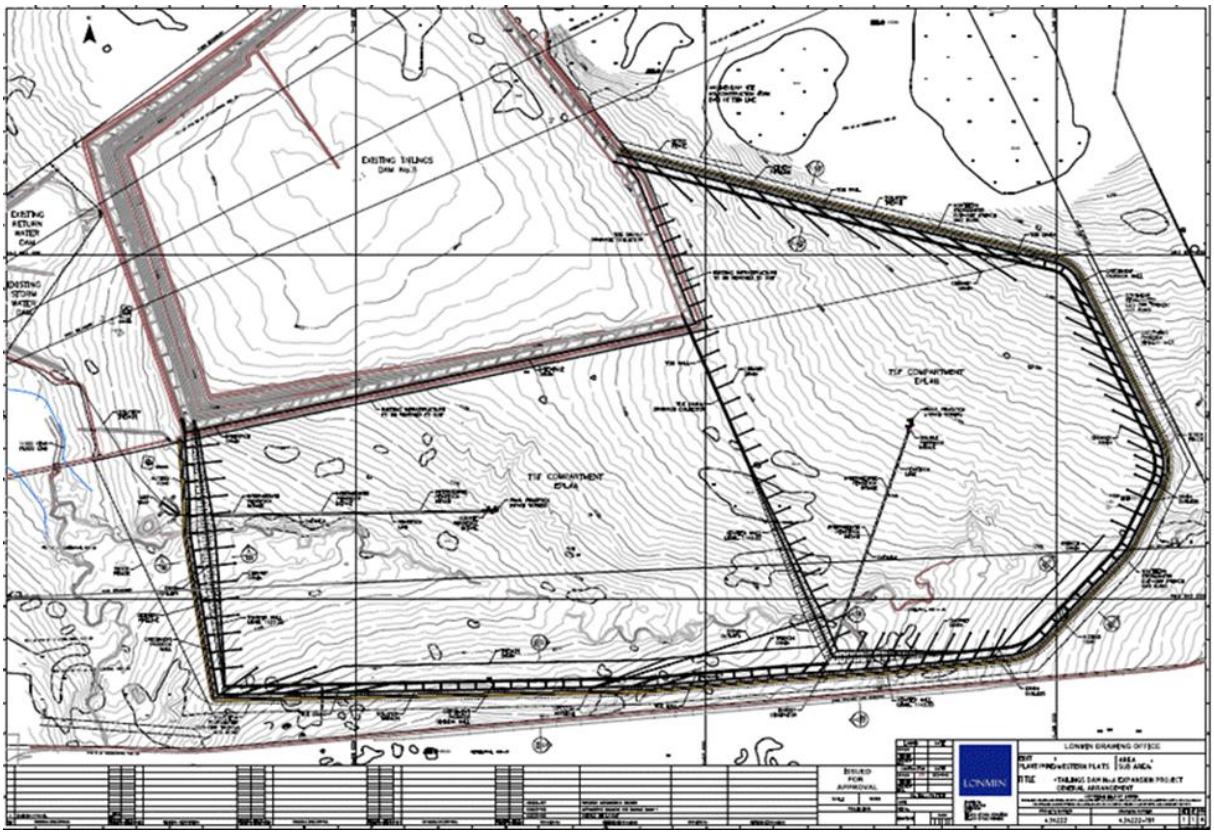

Figure 2-3: Drawing of proposed tailings storage facility 8

2.4.1 Concurrent grassing of side slopes

As the bottom steps of the tailings storage facilities are completed, Lonmin composts the surface of the side slopes to provide a growing medium for grass. The slopes will then be grassed by seeding and hand plants. This is done in the rainy season to ensure optimal growth opportunity.

Grassing will be done on completed sections of the dam outer walls, starting from the bottom. This will prevent erosion on completed sections and minimise dust generation from these completed sections. See Figure 2-1 and Figure 2-4 for examples of grassed slopes on current Lonmin TD.

Figure 2-4: Photograph of grassed slopes of TD3, TD4 and TD5 complex

2.4.2 Return water dam

An extension and upgrading of the existing TD6 return water dam will be used for the proposed TD8 and TD9. The return water dam will be drained by pumping any residual water to the Central and Eastern Concentrators for re-use. As part of the upgrading of the existing return water dam the following activities will take place:

- The empty return water dam will be dredged to increase its capacity;
- The dredged material will be placed on the existing TD6;
- The dam wall will be expanded to ensure sufficient capacity. The capacity of the dam is proposed to be 380 000m3. This capacity will ensure the dam can hold contaminated water from TD8 and TD9 during heavy rainfall events (up to a 1:50 year flood event in compliance with GN704 regulations);
- The return water dam will be lined with a plastic liner to prevent ground water pollution; and
- The return water dam will likely have a wall higher than 5m and may cover more than 10ha in total when expanded. The DWA Category 2 Dam safety standard will be applied to the design and operation of the dam.

Figure 2-5 explains the role of the return water dam.

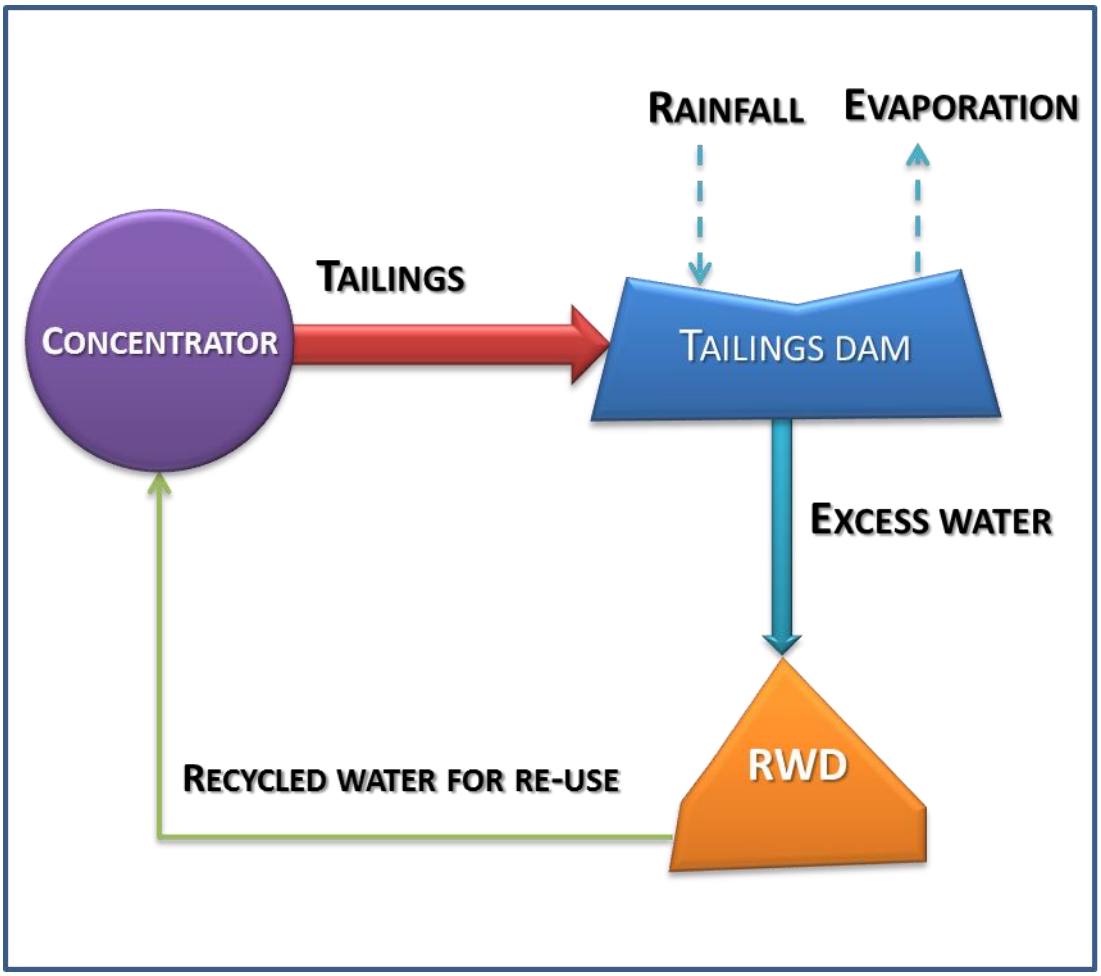

Figure 2-5: Simple schematic of water recycling for tailings deposition

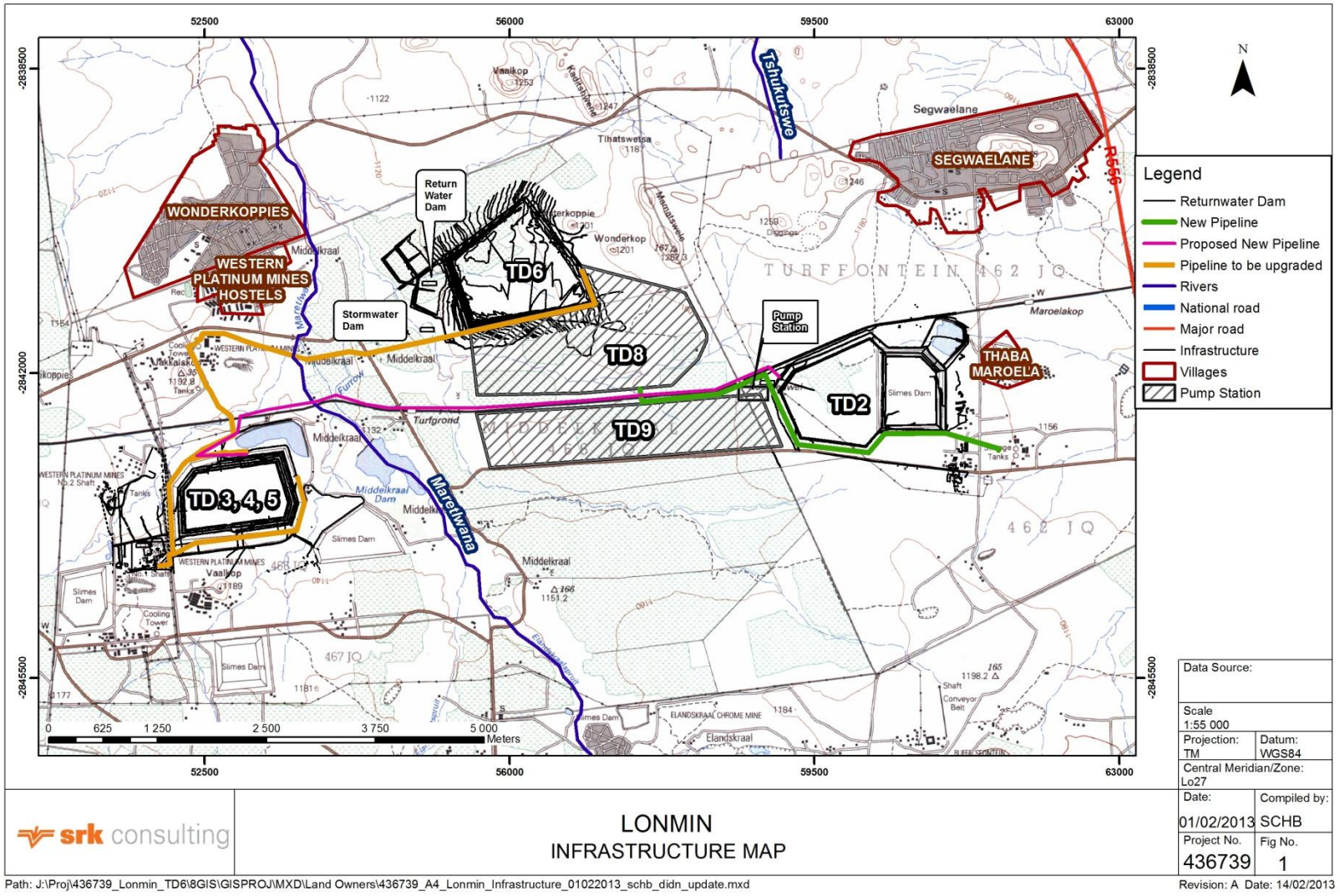

Figure 2-6: Locality map for proposed project

2.5 Utilities and services

Electricity

Electricity for the pump stations (one upgraded and one new) will be drawn from the existing electricity supply to the mine. The additional load forecast is expected to be region of 2MVA.

Water supply

Water from the return water dam will be used as a source of water for dust suppression.

Waste management

Waste management will be in line with current Lonmin Waste Management Procedures. Waste generated during construction will be collected in dedicated skips and disposed of by the contractor to a licensed waste disposal site.

Offices, workshops and change houses

Offices, workshops, change houses and other key infrastructure will be required for the maintenance of equipment and for staff. The existing facilities on WPL and EPL will be utilised.

2.6 Labour

Lonmin envisages using its current labour complement for the construction and operation of the project. Thus, no permanent new job opportunities will become available due to the project. During construction around ten new jobs may be created for monitoring of construction process.

The project will help ensure ongoing employment at the mine by providing sufficient tailings storage capacity for the mining operations in the long term.

2.7 Health and safety

Lonmin has strict health and safety procedures that will be applied to this project. All work will be done in compliance with the Mine Health and Safety Act.

3 Applicable legislation

(As per NEMA Act 107 of 1998 and the EIA Regulations (R543, June 2010) Regulation 28 (f))

Table 3-1: Scoping report requirements as per NEMA and MPRDA

Description	NEMA (Act 107 of 1998 together with R543 of 2010)	MPRDA (Act 28 of 2002, together with R527 of 2004)	Section of the report
Details and expertise of EAP	28(1)(a)		1.2
Project Description	28(1)(b)		2.0 – 2.6
Location	28(1)(d)		2.7
Affected Environment	28(1)(e)	49(1)(b)	3
Need and Desirability	28(1)(i)		1.1.2
Alternatives	28(1)(c) and (j)	49(1)(d)	4
Scoping Methodology		49(1)(a)	5
Impact Methodology	28(1)(n)	49(1)(e)	6.4.1
Potential Impacts and Mitigation	28(1)(g)	49(1)(c)	6.4
Legislation and guidelines	28(1)(f)		2.8
Public participation	27 (b); 28(1)(h); 54 (2),(3),(4) & (5); 54(7)	49(1)(f)	5.1 Appendix C
• Steps			5.1-5.1.4 Appendix C
• Issues	28 (1)(h)		5.1.5 Appendix C
• Comments	28 (1)(k),(l) & (m)		5.1.5 Appendix C
• IRR	56		5, Appendix C
• I&APs	27(c); 28(1)(h); 55(1) & (2)		5, Appendix C

3.1 National Environmental Management Act (NEMA)

The EIA for the proposed infrastructure will be conducted in terms of the EIA Regulations R544 and R545 and R546 that were promulgated in terms of Section 24 (5) of the National Environmental Management Act (Act 107 of 1998). These EIA Regulations have been applied from 1st August 2010 and relate to various procedural, reporting and personnel related aspects of EIA. The activities that require authorisation in terms of these regulations are given in Table 3-2 below.

Table 3-2: Displaying NEMA triggered activities

Indicate the number and the date of the relevant notice	Activity No in terms of the relevant notice	Describe each listed activity as per project description
GNR 544, 18 June 20100	9	The construction of facilities or infrastructure exceeding 1000 metres in length for the bulk transportation of water, sewage or storm water - (i) with an internal diameter of 0,36 metres or more *The pipelines will be approximately 20km long in total with a diameter of 200mm.*
	11	The construction of: (i) canals (ii) channels (iii) bridges where such construction occurs within 32m of a watercourse *Although every effort will be made to stay out of the 1:100year floodline and 32m boundary of a watercourse, this may not be possible in all areas. The pipeline will cross a stream diversion.*
	18	The infilling or depositing of any material of more than 5 m^3 into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock or more than 5 m^3 from: (i) a watercourse *The stream diversion and potential digging of borrow pits trigger this activity*
	22	The construction of a road, outside urban areas (i) with a reserve wider than 13,5 meters (ii) where no reserve exists where the road is wider than 8 m *The tailings storage facilities and pipeline will have associated service roads*
	28	The expansion of or changes to existing facilities for any process or activity where such expansion or changes to will result in the need for a permit or licence in terms of national or provincial legislation governing the release of emissions or pollution. *The water use license of the mine will require amendment.*

Indicate the number and the date of the relevant notice	Activity No in terms of the relevant notice	Describe each listed activity as per project description
	37	The expansion of facilities or infrastructure for the bulk transportation of water, sewage or storm water where: (a) The facility or infrastructure is expanded by more than 1000m in length: or (b) Where the throughput capacity of the facility or infrastructure will be increased by 10% or more *Pipelines will be expanded from the Rowland concentrator to the proposed TD8*
	41	The expansion of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, where the combined capacity will be increased by 50 000m^3 or more. *The return water dam will be expanded by more than 50 000m^3*
GNR 545, 18 June 2010	15	Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where th total area to be transformed is 20 hectares or more *The footprint of both proposed TD8 and proposed TD9 will be bigger than 20ha.*
	19	The construction of a dam, where the highest part of the dam wall is 5m or higher or where the high-water mark of the dam covers an area of 10ha or more. *The return water dam will have a wall higher than 5m and will cover more than 10ha in total when expanded.*
GNR 546, 18 June 2010	14	The clearance of an area of 5 hectares or more vegetation where 75% or more of the vegetatic cover constitutes indigenous vegetation in the Nor West Province. *The Marikana Thornveld is protected according the Biodiversity Act Dec 2011, GN No 10029. Bo proposed TD8 and proposed TD9 are planne within indigenous vegetation.*

3.2 Mineral and Petroleum Resources Development Act (MPRDA)

In terms of the Mineral and Petroleum Resources Development Act (Act No. 28 of 2002), Lonmin has an approved EMP from the DMR. An EIA and EMP Amendment for the project, as set out in Regulation R527 of the MPRDA and as required in terms of Section 102, are required.

3.3 National Heritage Resources Act

A Phase I Heritage Impact Assessment (HIA) study as required in terms of Section 38 of the National Heritage Resources Act (No 25 of 1999) was carried out for Lonmin's proposed extension of the existing TD6 to incorporate TD8 and TD9 by a registered Heritage Practitioner. Lonmin has in accordance with the recommendations of the Heritage Report taken all precautions to avoid heritage damage when designing the new infrastructure project. Should heritage resources be uncovered at a later stage, or any heritage resources impacted

on by with the current layout and position, Lonmin will take action so as to comply with South African Heritage legislation

3.4 National Environmental Management Biodiversity Act, Act 10 of 2004 (NEM:BA)

The Marikana Thornveld is protected in terms of Government Notice GN 10029, promulgated in terms of the National Environmental Management: Biodiversity Act, Act 10 of 2004. It is a legal requirement for Lonmin to carry out a Biodiversity study for this project.

3.5 National Environmental Management Air Quality Act, Act 39 of 2004 (NEM:AQA)

The Marikana area has recently been incorporated into the Waterberg-Bojanala Priority Area (GN 104 of 2013 with reference to GN 495 of 2012). This is based on the possibility of this area exceeding the national ambient air quality standards in the near future and as such needs specific national air quality management action.

3.6 National Water Air, Act 36 of 1998 (NWA)

In terms of the NWA, an Integrated Waste and Water Management Plan (IWWMP) is also needed as part of the WULA. This is needed as various activities such as crossing of streams, dirty runoff from TD and the expansion of the current return water dam..

4 Receiving Environment

(As per NEMA Act 107 of 1998 and the EIA Regulations (R543, June 2010) Regulation 28 (e) and the MPRDA Act 28 of 2002 and associated Regulations (R527 of 2004) Regulation 49(1)(b))

This section of the report presents an overview of the baseline environment within which the proposed project will be undertaken. The data is sourced from the WPL EIA MPRDA consolidated report compiled in 2012. The specialists are currently undertaking their studies for the project. Once all the studies are completed, the information will be presented in the EIA report.

4.1 Geology

The geology of the area comprises of the Rustenburg Layered Suite of the Bushveld Complex, which is thought to be the world's largest mafic-ultramafic layered intrusion which underlies an area of roughly 66,000 km2. The Bushveld complex which is well known for its large platinum and palladium resources consist of three different ore bodies namely:

- Merensky Reef;
- Upper Group (U2) Chromotite; and
- Platreef.

The WPL is situated within the western limb of the Bushveld Complex. The Rustenburg Layered Suite is the collective name for the mafic-ultramafic rocks found in the Bushveld Complex and has been subdivided into zones namely the Marginal, Lower, Critical, Main and Upper Zones which ranges from the base of the Suite to the top of the Suite. Of significant importance is the Critical Zone which contains chromium and Platinum Group Minerals (PGM's) within the Bushveld Complex. The Critical Zone is host to both the Merensky Reef and UG2 Reef which are found in the upper sub-zone. The Merensky Reef lies above the UG2 Reef (approximately 130 m to 210 m above) with both economic layers exhibiting a general east to west strike trend. Dips vary from approximately 12 degrees in the south to around 10 degrees in the northern area. The Merensky reef and UG2 reef are therefore expected to be at depths of 1 250 m and 1 400 m respectively in the deepest parts of the mining area.

Underground mining operations at WPL consist of the UG2 Reef whilst the EPL-Opencast operations are focused on the Merensky and UG2 Reefs of the Upper Critical Zone

4.2 Climate

Lonmin is located within the eastern region of the North West Province and falls within the Highveld Climatic Zone

4.2.1 Temperature and precipitation

The climate of the North West Province is characterized by hot summers and cool sunny winters, with the rainy season usually occurring from October through to March. Temperature and precipitation varies from the eastern and mountainous areas receiving a rainfall of between 600-700mm per annum to the drier western areas receiving less than 300mm per annum.

Lonmin has four meteorological monitoring stations across the EPL and WPL operations. The average monthly temperatures recorded at these stations for the period of 2010 range between 16ºC and 30 ºC during summer months and 7 ºC to 19 ºC during the winter months. The long term annual rainfall for the Rustenburg region is from 630mm to 740 mm.

4.2.2 Wind

The annual wind direction recorded in 2010 at the Lonmin meteorological stations (in percentage of time) is shown in Figure 4-1 below with the highest average wind speed (in metres per second -m/s) being 8.3 m/s.

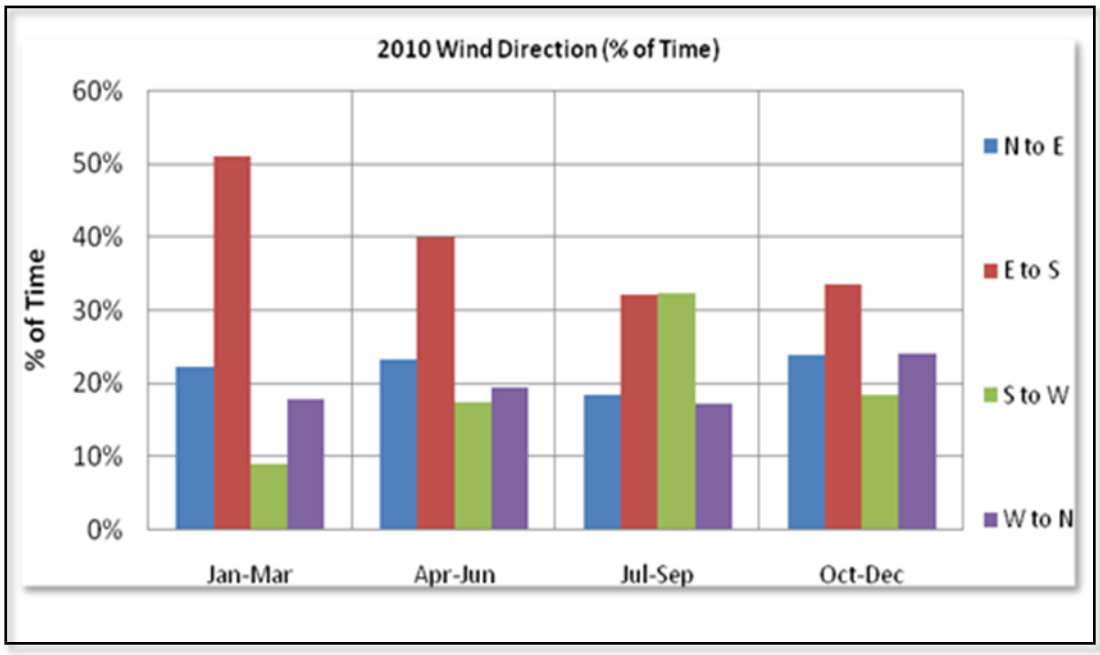

Figure 4-1: Wind record from Lonmin met stations for 2010 (WPL EMP)

4.3 Topography

The North West Province is typically flat or has gently undulating plains within its central and western regions, whist the eastern region varies in typography which also produces the Magaliesburg mountain range. The altitude of the North West Province ranges from 920 - 1782 m above sea level. The typography of WPL MRA is typically very flat to slightly undulating and lies within a seemingly east-west valley bottom.

The mine area is situated between two hills (Magaliesburg and Kareepoortberg) which have an average of 100-180m above the surrounding plains with the highest points being 1357m above sea level. The catchment area is drained by the Crocodile River and associated tributaries in a northern direction.

4.4 Soils

According to the WPL and KM EMP dated 2005, a soil study was undertaken by CHEMC for the entire WPL site. The findings indicated that 81.4% of all the soils observed at Lonmin are black to dark brown, swelling clay soils of the Arcadia soil form, typically deeper than 1000 mm, with a high clay content (>40% clay) and high pH (>7.5). They are also known as turf and cracking clay soils and are commonly associated with platinum bearing geology.

This soil form is naturally fertile, with high cation exchange capacities and high organic carbon contents. Smaller areas with other soil types occur that are mainly the following:

- Areas of red, structured and non-structured, sandy clay loam soils of the Hutton and Shortlands soils forms occur, as do other (non-swelling) clay soils of the Swartland and Valsrivier soil forms; and
- In the granite areas to the north-west of the Marikana operations (*inter alia* where granite mining is taking place), the steeper topography is associated with shallow dark clay soils of the Milkwood, Mayo, Mispah and Glenrosa soil forms.

4.5 Pre-mining land capability and land use

According to the WPL Consolidated EMP (2012), the current operations at WPL are in line with the LDO/IDP for the relevant magisterial council. These include the development and operation of mining related activities as a land use that contribute positively to job creation, wealth and regional development.

Land Capability

Four classes of land capability are listed in the WPL Consolidated EMP:

- Arable land;
- Grazing land;
- Wilderness land; and
- Wetlands.

Land use in surrounding communities

Goods and services including refuse removal, electricity and housing schemes by locals living in surrounding informal settlements (which are gradually encroaching on active mining areas).

Infrastructure used during the operational phase can become an asset for Lonmin after mining ceases. Capital investments have already been made in this regard including landfill sites which can be used by the municipality for further use.

4.6 Flora

The vegetation type at WPL is identified as Rustenburg Gabbro Thornveld (Low & Rebelo, 1996). According to the CHEMC Fauna and Flora Report (2005) for the entire LPMO four main habitat types are applicable to the WPL area, namely:

- Grassland Habitats: This habitat varies greatly in size and in ecological diversity and is not truly a natural habitat, but has been established through the rehabilitation of disturbed areas, agricultural activities, etc.;
- Turf Thornveld (Bushveld) Habitats: Main habitat type identified within WPL and consists of grassland intercepted with both thorn and other trees. Trees within the area typically identified as: *Combretum molle, Croton gratissimus, Ficus soldanella, Pappea capensis, Bridelia mollis, Canthium huilense, Clerodendrum glabrum, Combretum apiculatum, Diplorhynchus condylocarpon, Dombeya rotundifolia, Euclea natalensis, Euphorbia cooperi, Ficus sonderi, Lannea discolor, Peltophorum africanum, Sclerocarya birrea, Shrubs: Grewia flavescens, Pouzolzia hypoleuca, Vitex zeyheri;*

- Aquatic Habitats: The aquatic habitats identified include rivers, streams, wetlands, dams and the associated vegetation of these habitats. Perennial and non-perennial streams are found within WPL; and
- Granite Hills and Outcrops: Within the Turf Thornveld, granite outcrops of varying size are encountered. These outcrops and hills (at Segwealanie) form noticeably different habitats to the Turf Thornveld.

Significant disturbance exists within these habitats in the form of agricultural lands or settlements which have led to the removal of natural vegetation. Some of the areas are characterised by overgrazing where other areas of declared weeds and invader species. WPL is situated within an area containing medium hyperdiversity (meaning high diversity within a taxon) that contains more species, general or higher ranked groups and high hyperdiversity for the river systems areas.

In addition to the above-mentioned habitat types, large portions of the mine consist of agricultural lands or settlements. The agricultural lands have resulted in the complete removal of the natural vegetation. The vegetation surrounding the settlement areas is characterized by overgrazing and bush encroachment. A large number of declared weeds and invaders were also identified in these areas, as these plants were originally planted as “garden plants” in many of the areas.

Alien vegetation was recorded in 46% of the 190 surveyed plots. The majority of declared alien vegetation was observed in formal settlements followed by old fields, drainage lines, riparian areas, natural woodlands and mine dumps and pits.

Lonmin developed a Biodiversity Action Plant (BAP) in 2009, which had the following results:

- The mine is dominated by Turf Thornveld with isolated granite outcrops. These outcrops provide small islands with different condition, habitats and species;
- Large portions of the mine, within the north, consists mostly of agricultural lands which created interesting habitats; and
- The storage of water as part of the mining operation has created unique habitats in which is predominately a dry habitat.

4.6.1 Rare, endangered and protected species

Two species listed under the Old Transvaal Ordnance of 1983 (No. 12 of 1983) were identified within WPL namely, *Eucmos autumnalis* (south eastern section of the site) and *Gladiolus spp*. A permit is needed to remove, replant or transport these plants. No other species of red data or endangered status were observed. Furthermore three protected tree species are also present within the boundaries of WPL according to Schedule No. 1042 dated 10 September 2004 (published in Government Gazette No. 26752) namely *Combretum imberbe, Boscia albitrunca* and *Sclerocarya birrea*. A permit is also necessary for the removal of these trees.

The Marikana Thornveld is a protected ecosystem according to the NEM:BA, GN No 10029. Both the proposed TD8 and TD9 are planned within areas where indigenous vegetation is known to occur and a specialist assessment will be conducted to determine possible impacts to this ecosystem.

4.6.2 Alien invasive species

Declared alien and invasive species are found within the boundaries of WPL. There are three categories of alien and invasive species according to the Conservation of Agriculture Resources Act, 1983 (Act No. 43 of 1983) namely:

- Category 1: Declared weeds that are prohibited on any land or water surface in South Africa. These species must be controlled, or eradicated where possible.
- Category 2: Declared invader species that are only allowed in demarcated areas under controlled conditions and prohibited within 30m of the 1:50 year floodline of any watercourse or wetland.
- Category 3: Declared invader species that may remain, but must be prevented from spreading. No further planting of these species are allowed.

The biodiversity specialist assessment will determine the presence of any alien invasive species.

4.7 Fauna

According to the Fauna Survey undertaken by CHEMC in 2005, the WPL area is found to have:

- High bird species diversity due to the presence of aquatic habitats created by mine related activities and natural vegetation. Low number of game birds were noticed at WPL which could be the result of poaching by the local residents or the presence of stray dogs on site (presumable from adjacent township areas); and
- Low mammal and reptile diversity as a result of mining activities, settlements and grazing practices exercised by the surrounding community.

The BAP study shows the following results:

- Perennial rivers should be considered a high priority as they provide ecological continuity;
- Riverine vegetation provides essential breeding and foraging habitat for waterfowl and aquatic biodiversity. It acts as a dispersal mechanism for various faunal species;
- The norite koppies are under sever mining pressure but provide unique spots for faunal especially those that have a restricted range and are under threat (i.e. rock scorpion); and
- The outcrops also provide a spatial heterogeneity which helps contribute to the mosaic of micro-habitats and niche space.

4.7.1 Rare and endangered species

One Red Data species was identified within WPL area, namely the South African Hedgehog (Alterix frontalis) which is classified as Near Threatened according to the IUVN Red List (version 3.1).

The biodiversity specialist assessment will determine the presence of any protected species.

4.8 Wetland

The presence of wetlands is not known at present. A desktop delineation of potential wetland and riparian areas will be undertaken by identifying rivers and wetness signatures on the

digital base maps. All identified areas suspected of being wetlands or riparian zones will then be further investigated in the field.

4.9 Surface Water

The mean annual runoff (MAR) in the North West Province is very low; average MAR is 6% of precipitation for the entire province, which is below the average of 9% for Southern Africa. WPL and EPL are located within the Lower Crocodile sub-catchment (A21J and A21K) within the Crocodile (West) and Marico Water Management Area.

The affected watercourses within the WPL mining right area include the Maretlwane Spruit and sections of the Sterkstroom, Hoedspruit and Brakspruit including their associated tributaries which traverse the WPL area. The receiving water bodies for the entire WPL include the Sterkstroom and Maretlwane spruits located immediately downstream of the mining area. These streams form part of the Highveld Source Bioregion as per the Classification of Brown *et al* (1996). Overall surface water quality concerns include:

- Water quality related constituents of concern are EC, NO3, Cl, SO4, F and SAR;
- The in-stream concentrations of the metals such as Cr, Cu, Pb, Mn and Se are generally elevated; and
- The in-stream water quality displays, as expected, strong seasonal variation with elevated concentrations during the dry winter months.

Surface water monitoring

Surface water monitoring points are positioned within the WPL closed water system (RWD from the tailings storage facilities, process water and storm water dams) as well as within the natural streams flowing through the Sterkstroom and Maretlwanespruit .These results are presented annually to the DWA in the form of an annual management report.

4.10 Groundwater

According to the WPL Consolidated EMP (2012), groundwater levels resemble that of the local typography flowing in a northerly direction at an average gradient of less than 5%. Groundwater monitoring boreholes indicate that the WPL is underlain by black silty clay layer varying from 1m to 3m in thickness. This layer is followed by an eroded norite-gabbro or weather and fractured anthrosite which is again followed by hard rock norite-gabbro. It is generally expected that the groundwater flow occurs mostly along the fractures of the underlying geology and entering into surface water bodies such as streams.

Quarterly monitoring of water quality as well as the depths of the ground water is carried out at various monitoring points around the mining facilities by Lonmin. The groundwater is on average approximately 5.5mbgl, with a maximum of 53.7mbgl and a minimum of 0.09mbgl.

The groundwater results show that over a period of time the pH and EC have remained more or less the same. However NO_3, chloride, EC, sulphate and sodium absorption is of concern. Elevated levels of Cu (copper), Pb (lead), Hf (mercury), Zn (zinc) have been detected and to a lesser extend Mn (manganese), Se (selenium), Cr (chromium) concentrations.

4.11 Air quality

Ambient air quality is determined by the cumulative impact of a variety sources and the meteorological conditions prevalent. Meteorological conditions govern the dispersion, transformation and eventual removal of pollutant from the atmosphere. Ambient concentration levels therefore fluctuate in response to changes in atmospheric stability, variations in the mixing depth, and shifts in the wind field. Spatial variations and diurnal and seasonal changes in the wind field and stability regime are functions of atmospheric processes operating at various temporal and spatial scales. According to WPL Consolidated EMP (2012), sources of air pollution for the North West Province and the Bojanala Platinum District Municipality influencing the Lonmin ambient environment are commercial and domestic fuel burning, incineration, biomass burning, industrial operations, mining and associated activities, agricultural activities, vehicle entrainment from unpaved roads, informal waste combustion, wind-blown dust from open areas, vehicle tailpipe emissions.

Lonmin has employed an extensive ambient air quality monitoring network which assesses the ambient air quality in and around sensitive receptor areas for the following parameters

- Dust Fallout Monitoring to assess the dust deposition rates (on and off-site);
- Ambient SO2 concentrations by means of continuous ambient air quality monitoring (station is located in the community of Wonderkop);
- Ambient PM10 and PM2.5 concentration in Wonderkop by means of continuous monitoring (data recovery and subsequently data validity is low and data is thus not adequate for the required analysis and interpretation into the specialist report); and
- Ambient SO2 monitoring by means of passive diffusive sampling. Monitoring is undertaken at numerous locations (on and off-site).

The monitoring data will be used to characterise the baseline in the air quality specialist assessment.

4.12 Archaeological and cultural heritage sites

All efforts have been made to avoid sensitive heritage located on the koppies north of the tailings storage facilities. In 2012, a heritage study was carried out by a certified practitioner on the proposed project. In the event that heritage resources are uncovered during the construction or operation process, Lonmin will take the necessary action to comply with South African National Heritage Act and a heritage practitioner will be called to site to secure, catalogue and safely remove (where possible) any discovered heritage resource. All settlements older than one hundred years and all structures or part of structures older than sixty years located in this region are protected by the National Heritage Resources Act, 1999 (Act No. 25of 1998).

Forty or more stone walled sites (or clusters of stone walled sites) occur between the granite koppies to the north-east of WPM and north of EPL. Numerous graves are located on WPL, associated with nearby houses and settlements (historical and current). A number of graves have been moved in the past for opencast activities. Remains of ‘traditional’ Batswana residential villages have been found along the base of the un-named koppie on the eastern perimeter of TD6. An archaeological site of particular interest at WPL was found at the base of an un-named koppie on the eastern boundary of the WPL property. Two additional archaeological sites that exist within close proximity are Wolhuterskop and Pramkop.

In order to comply with all necessary legislation, permissions to exhume and re-inter the human remains and associated grave dressings and cultural remains were obtained from:

- The South African Heritage Agency;
- The South African Police Services at Mooinooi; and
- The Department of Home Affairs.

The proposed project is close to a number of hills (koppies) covered with stone walled settlements dating from the late Iron Age and the Historical Period. Settlements occur at hills such as Kaditshwene, Thatswetla, Mamatshwele, Ysterkoppies and Wonderkop which culturally and historically constitute a cultural landscape of some proportions. Other historical beacons occur to the north of the Lonmin Project Area whilst the new tar road which runs between Segwaelane and Marikana separates these historical hills in the north from those located in the Lonmin Project Area in the south. Some of the sites in and near the Lonmin Project Area may be affected or destroyed when TD8 and TD9 are constructed. Measures to protect, document and relocate these resources will be developed during the EIA process.

4.13 Visual aspects

Due to the relatively flat topography and vegetation cover (typical savannah with scattered trees and shrubs); the visual quality of the area surrounding WPL is moderate. The quality has been affected by the intrusion of anthropogenic influences such as mining activities, cultivated lands and infrastructure.

Lonmin is situated within a landscape that contains a topography that is flat or gently undulating. Lonmin is visible from the north and south lying mountains. However, the views within the flat landscape are restricted by a lack of elevated viewpoints. The proposed infrastructure will be located within the mine premises, next to the existing TD6 and in close proximity to existing mine infrastructure.

4.14 Socio-economics

Administratively, the North West Province is divided into four district municipalities, namely: Bojanala, Central, Southern and Bophirima, which collectively comprise of 21 local municipalities. The project area falls within the Madibeng Local Municipality, situated within the Bojanala Platinum District Municipality.

The North West Province is regarded as the sixth largest populated province with 3.4 million residents (8.3% of the national population). Approximately 35% of the people in the province are urban dwellers and 65% live in rural areas. Of the 3.4 million people in the province, 6.6% are whites, 1.4% coloureds, 0.3% Indians and 76.7% are Africans. Just over 50% of the people in the province are female which is consistent with national figures. It is estimated that almost 35% of the total adult population can be regarded as illiterate.

The North West Province's economy is derived from a variety of sectors, of which mining and agriculture are the main contributors. The mining sector is the lead contributor to the Province's economy (35.5% contribution to the domestic economy in 1996). Approximately 118 000 formal employment opportunities are provided by the mining sector (22% 0f total employment available in the province). Bojanala Platinum District Municipality (BPDM) makes up 38.7% of the North West Province's total population. The unemployment rate in the district has increased over the period 1996 to 2003 from 140000 to 271000.

5 Alternatives

As per NEMA Act 107 of 1998 and the EIA Regulations (R543, June 2010) Regulation 28 (c) and (j) and MPRDA Act 28 of 2002 and associated Regulations 9R527 of 2004) Regulation 49(1)(d))

Site and disposal technologies considered by Lonmin are briefly documented below.

5.1 No Project Alternative

Should the proposed new infrastructure project not go ahead, TD2 and TD6 would reach their maximum capacity and be unable to contain any more tailings. Although Lonmin has mining reserves that would last beyond 2060, the life of the mine would be shortened to 2018 within the central and eastern areas due to insufficient tailings storage space. The No Project alternative would have the following consequences:

- Cessation of mining operations as soon as TD2 and TD6 reach full capacity.
- Retrenchment of workers; and
- Secondary social and economic impacts to the region due to the mine's closure.

Most likely, as is current practice, grazing will continue if the project is not developed since parts of the proposed site are already used for and disturbed by mining and agricultural activities.

5.2 Site alternatives

Alternative locations for the tailings storage facilities have been investigated but were disregarded in order to mitigate impacts on the biodiversity , heritage, water sources and surrounding communities. The preferred TD8 and TD9 site alternative were chosen for the following reasons:

- It is within the existing mining area;
- It is located on an area already disturbed by mining and agriculture, and therefore would not result in damaging untouched/virgin areas;
- It is close to an existing tailings storage facility allowing for consolidation of tailings storage;
- It can service both EPL and WPL sections;
- Due to its proximity to existing infrastructure, there would be a minimal visual impact;
- There is no mining activity beneath the site;
- The physical area of the footprint can meet the requirements for disposing of life of mine tailings production; and
- Proximity to existing infrastructure would mean shorter pipelines.
- Optimising current infrastructure in that the location will allow for the sharing thereof (RWD, pipelines, etc.)

Various alternatives relating to deposition method, paste etc have been examined. The results of these studies are available upon request.

6 Scoping Methodology

(As per MPRDA Act 28 of 2002 and associated Regulations (R527 of 2004) Regulation 49(1)(a))

The scope of the EIA set out in the above sections was determined using a risk-based approach, which considers the sensitivity of the particular environmental aspect in the study area and the level of confidence required for decision making. The higher the level of sensitivity or potential impact on the project or vice versa and the higher the level of confidence required for decision making, the greater the level of study required. This relationship is best explained in Figure 6-1. Such professional risk-based judgments on the scope of the EIA were guided by local knowledge and issues highlighted by Interested and Affected Parties during the public consultation process.

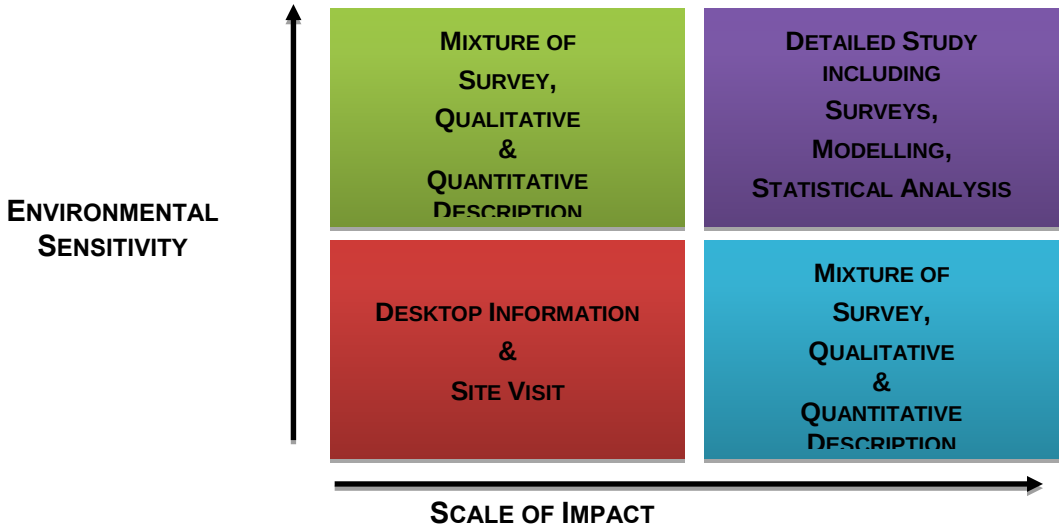

Figure 6-1: The relationship between environmental aspect and confidence level needed for decision making

6.1 Integrated authorisation process

The authorisation processes and specialist studies for the EIA and EMP Amendment are running in parallel, with a single public participation process for the EIA, EMP Amendment and WUL amendment, as outlined in **Figure 6-2**.

6.2 Public participation during scoping

The Stakeholder Engagement Report, Appendix D, details the public participation process followed for the project. The stakeholder engagement process is designed to provide sufficient and accessible information to I&APs in an objective manner to assist them to:

During the Scoping Phase

- Raise issues of concern and suggestions for enhanced benefits;
- Verify that their issues have been recorded; and
- Contribute relevant local knowledge and traditional knowledge to the environmental assessment.

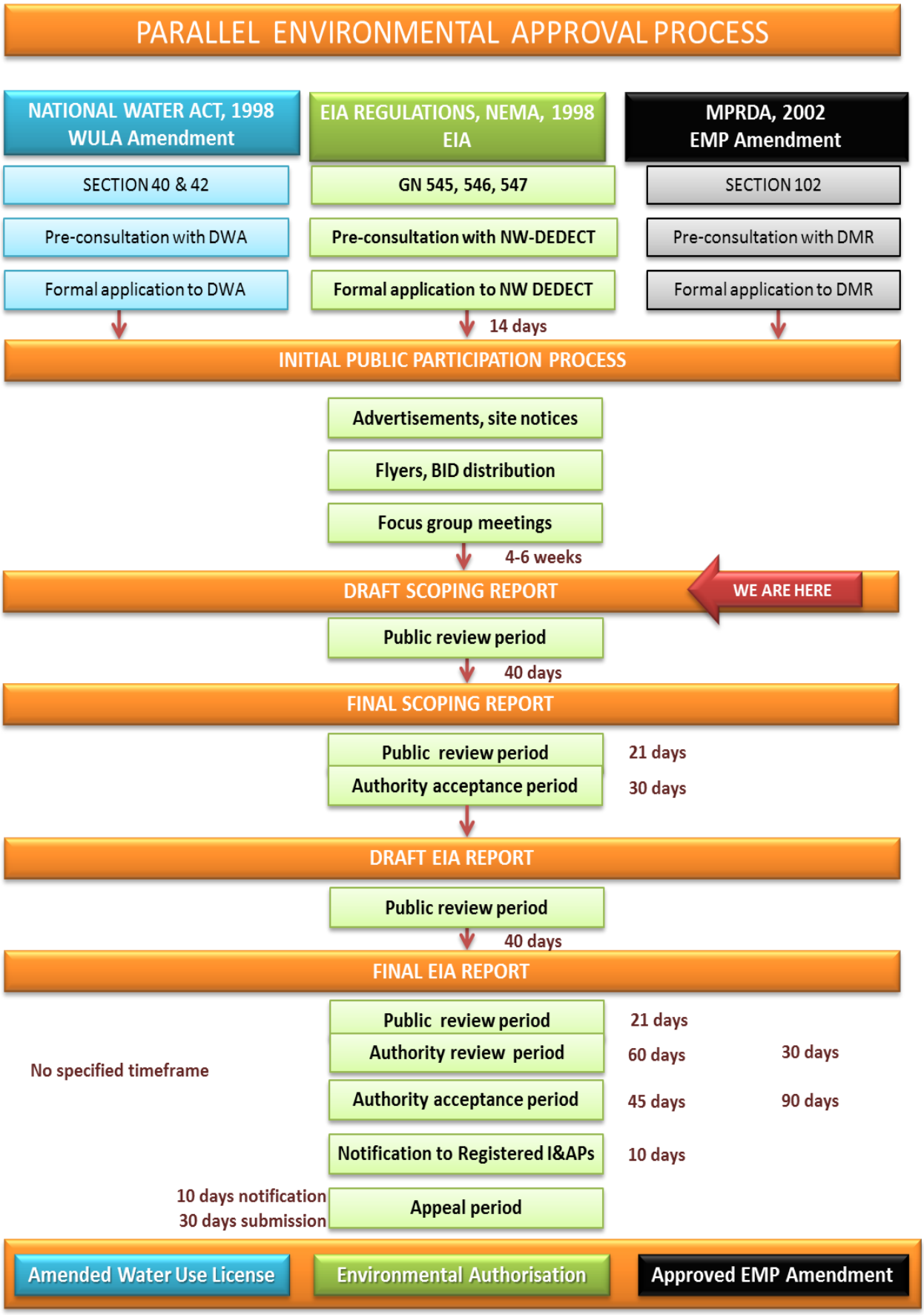

Figure 6-2: Integrated authorisation processes with single public participation process

During the Impact Assessment/EMP Amendment Phase

- Contribute relevant information and local traditional knowledge to the environmental assessment;
- Verify that their issues have been considered in the environmental assessment; and
- Comment on the findings of the environmental assessment.

During the Decision-making Phase

- Advise I&APs of the outcome, i.e. the authority decision, and how and by when the decision can be appealed.

6.2.1 Identification of Interested and Affected Parties

The following I&APs were identified for the project:

- Landowners around the proposed site;
- District and local municipality ward councillors as well as the municipalities themselves;
- Traditional authority structures;
- Relevant government department officials;
- Community based organisations that may have an interest in the project; and
- Non-government organisations that may have an interest in the project

The full database used to announce the project and the registered I&APs are given in Appendix D.

6.2.2 Project announcement

The project was announced by means of (see Appendix D):

- Advertisements in English and Afrikaans in the Brits Pos and Rustenburg Herald. Advertisements were also placed in Xhosa and Setswana in Lonmin's newsletters.
- Background Information Documents in English, Afrikaans, Xhosa and Setswana were posted or emailed to identified I&APs. In addition, copies were provided to ward councillors for communication to their constituencies and were also placed in public places such as libraries in the area, Lonmin Community Centre, hostels and Lonmin reception area.
- Site notices were erected on site as well as at various public places within the study area.

6.2.3 Focus group meetings

Focus group meetings were held with Bapo Ba Mogale Traditional Authority and relevant sub-committees of Segwaelane and Wonderkop villages as well as ward councillors and district and municipal officers to explain the project and the EIA process. Telephonic consultation was carried out with local landowners in close proximity to the farms where the proposed infrastructure will be located (see Appendix D).

6.2.4 Review of the Draft Scoping Report

A period of 40 days is being allowed for public review of the DSR. The availability of the DSR was announced by way of:

- A letter to all I&APs;
- Media advertisements;
- Copies and comment sheets left in the same public places used to announce the project;
- The SRK website (www.SRK.co.za); and
- Sent to stakeholders that would request a copy.

Public review of the DSR will be conducted using the following methods:

- Written comment, including e-mail or by completing a comment sheet accompanying the report and mailing, e-mailing or faxing it to the Stakeholder Engagement Office at SRK; and
- Verbal comment during focus group meetings held in the project area.

6.2.5 Issues raised during scoping

All comments received and issues raised during the Scoping Phase are captured in a Comments and Response Report (CRR). In summary the following key issues were raised to date:

- **Employment and contract opportunities:** ward councillors indicated that the project team should maximise local job creation wherever possible although it was understood that the project would only generate a few temporary jobs during construction.
- **Dust and water pollution:** I&APs indicated that impacts such as dust and water pollution must be mitigated.
- **Expansion of local townships:** Wonderkop township residents indicated that the township is planning to expand in the direction of the proposed tailings storage facilities and that these expansion plans might be in conflict with the proposed TD8 and TD9. This issue will be investigated by Lonmin.
- **Alternatives:** the Madibeng Local Municipality indicated that site alternatives must be indicated in the reports.

6.2.6 Announcement of the availability of the Final Scoping Report for public comment

When the Final Scoping Report (FSR) is prepared at the end of the public comment period, it will be updated with additional issues, comments and suggestions raised by I&APs during the comment period.

A period of 21 days will be allowed for public review of the FSR. The availability of the FSR will be announced by way of a letter to all I&APs. The FSR will be made available at the same public places as the DSR and will also be available on the SRK website.

Registered I&APs will be notified of submission of the updated FSR to the authorities and may request copies of the Report.

7 Plan of study for EIA and EMP

(As per NEMA Act 107 of 1998 and the EIA Regulations (R543, June 2010) Regulation 28 (n) and the MPRDA Act 28 of 2002 and associated Regulations (R527 of 2004) Regulation 49(1)(e))

The plan of study for the EIA and EMP is set out below for review by the authorities and I&APs. The rationale for the different levels of study for the various environmental components is taken from the issues raised by I&APs, the expected severity of impacts and the level of confidence required in their prediction. The level of information required to develop adequate, practical management and mitigation measures was also a consideration in determining the terms of reference of studies.

7.1 Specialist Studies to be undertaken

For this specific project the following specialist studies will be carried out:

- Air Quality Impact Assessment;
- Biodiversity (Terrestrial and aquatic);
- Update of existing Heritage report ;
- Groundwater;
- Surface Water; and
- Soils (Geotechnical studies)

These studies will include collation of existing information, field surveys, sampling and mapping with impact assessment scenario's being undertaken using geographic information systems and qualitative and quantitative (where applicable) forms of impact analysis.

7.2 Cumulative assessment

Both the MPRDA and the NEMA EIA regulations require an assessment of the cumulative impacts. The cumulative impacts for the mine, as identified by specialists and in a workshop assessing risks and impacts will be included in the EIA. Specialists have been asked to consider surrounding land users including mines and agriculture.

7.3 Terms of reference for specialist studies

The terms of reference for the specialist studies are set out below. All specialist studies are required to meet South African standards and regulations.

7.3.1 Air quality

Scope of work

uMoya-NILU is currently contracted by Lonmin and has established a detailed dispersion modelling configuration for the site. This model will be extended to include TD8 and TD9. The scope of work includes the following:

- Describe the baseline meteorology and air quality scenario using available measured dust fallout data as well as monitored PM10 and PM2.5 data;

- Estimate emissions from TD8 and TD9 for different stages of growth of the two facilities, including the planned dust control measures for different seasons; and
- Assess the potential impacts of the emissions on ambient air quality and the surrounding environment by estimating the resultant ambient concentrations of PM10, PM2.5, selected metals and dust deposition rates and comparing with South African ambient air quality standards.

The legal context will be described in terms of the National Environmental Management: Air Quality Act (No. 39 of 2004) and the supporting regulations. These include:

- Ambient air quality standards (Republic of South Africa, 2009 and 2012a);
- Dust management (Republic of South Africa, 2011); and
- Declaration of the Bojanala - Waterberg Priority Area (Republic of South Africa, 2012b).

Methodology

Emissions of TSP, PM10 and PM2.5 and metals will be developed for the following scenarios for a typical summer month, a typical winter month, and for the annual average:

- TD8 at 50% of maximum size with and without dust control measures;
- TD8 at 100% of maximum size with and without dust control measures;
- TD9 at 50% of maximum size with and without dust control measures; and
- TD9 at 100% of maximum size with and without dust control measures

The emission inventory will be used as input to dispersion modelling to estimate ambient concentrations of the key pollutants for the impact assessment. The DEA recommended California Puff (CALPUFF) model is parameterised for the baseline air quality assessment. This model configuration will be used to predict ambient concentrations of TSP, PM10, PM2.5, selected metals as wells as dust deposition rates resulting from emissions from TD8 and TD9. The air quality modelling will utilise the 3-year pre-processed meteorological data that is available from the current baseline assessment project. The following emission scenarios will be modelled for the annual average case, typical summer month and typical winter month:

- TD8 alone at 50% of maximum size with and without dust control measures;
- TD8 alone at 100% of maximum size with and without dust control measures;
- TD9 alone at 50% of maximum size with and without dust control measures;
- TD9 alone at 100% of maximum size with and without dust control measures;
- TD8 and TD9 together at 50% of maximum size with and without dust control measures;
- TD8 and TD9 together at 100% of maximum size with and without dust control measures;
- TD8 and TD9 together at 50% of maximum size with and without dust control measures, with other sources of dust; and
- TD8 and TD9 together at 100% of maximum size with and without dust control measures, with other sources of dust.

The predicted ambient PM10 and PM2.5 concentrations and the predicted dust deposition rates, as well as the predicted number of exceedances of the respective South African

ambient air quality standards will be presented on a base map of the Marikana area for each scenario as concentration isopleths. The predicted ambient concentration and deposition rates of selected metals for the different emission scenarios will also be plotted as isopleths, and compared to appropriate international ambient air quality guidelines, e.g. World Health Organisation (WHO) and the US Agency for Toxic Substances and Disease Registry.

Deliverable

A comprehensive air quality assessment report that includes a description of the methodology, the receiving environment, the emission estimates, predicted ambient concentrations, and the impact assessment using the standard EIA approach for impact significance.

7.3.2 Biodiversity

Agreenco, terrestrial biodiversity assessments experts, will conduct this study. Agreenco has sub-contracted Wetland Consulting Services to undertake the aquatic assessment. The scopes of work for each of the two biodiversity components are as follows:

Scope of work for the terrestrial component:

- Mammalian diversity assessment;
- Reptilian diversity assessment;
- Amphibian diversity assessment;
- Avian diversity assessment;
- Invertebrate diversity assessment;
- Plant diversity assessment;
- Determine potential mitigations or offsets; and
- Compile monitoring program.

Scope of work for the aquatic component:

- Wetland and riparian zone delineation and classification;
- Vegetation survey of delineated aquatic ecosystems;
- Determine present ecological state and ecological importance, as well as a sensitivity analyses;
- Complete a SASS5 assessment on the aquatic invertebrates;
- Determine potential mitigations or offsets; and
- Compile monitoring plan.

Deliverables

A final report, with relevant maps and data analysis will be produced, covering the following:

- Habitat assessments and their associated levels of biodiversity importance;
- Species lists for each habitat and the identification of “species of significance”;
- Identification of potential risks to biodiversity as a result of the plan development;

- The identification of potential mitigating or offset actions which may prevent/ reduce the loss of biodiversity;
- A suggested monitoring program to determine long term impacts of development and biodiversity; and
- All findings would be assessed in their relation to the North West Provincial Biodiversity Assessment and the South African National Biodiversity Institute (SANBI) Guidelines.

7.3.3 Surface water and Groundwater

Praxos 741 cc, ground water and hydrology specialists will conduct the hydrology, hydrogeology, water and salt balances for the proposed project. Previous hydrogeological work undertaken in 2012 by SRK Consulting will be used in the assessment. The dynamic water balance for the proposed project will become part of the greater Lonmin integrated water balance to demonstrate the recycling and reuse of water within the larger Lonmin operational area. The dynamic water balance will then be isolated into a static water balance as required by DWA and the static water balance will be used to develop a salt balance. The hydrology will comprise of a concept level storm water management plan designed to meet requirements of GN704. The scope of work involves the following:

- Dynamic water balance simulation using Arena simulation software will be developed to determine the integrated water balance around TD8 and TD9. This water balance will be converted to a static water balance to meet DWA requirements, and to develop a salt balance for the system.
- A Salt balance will be developed in order to predict the quality of water for the following streams:
    - Leachate from the tailings that will report to the return water dam;
    - Seepage that could enter ground water beneath the liner; and
    - Spillage from the return water dam that could enter the local Maretlwanespruit.
- These qualities together with the predicted volumes of these waste streams will be assessed in order to determine their quantitative and qualitative impact on the environment, should this occur.
- Catchment areas will be calculated to determine runoff volumes given the historical rainfall record for the area. Based on the preliminary design of TD8 and TD9, clean and dirty areas will be defined and the measures to separate clean and dirty water will be assessed against the requirements of Regulation GN704.
- A conceptual storm water management plan will be developed in support of the EIA and IWUL amendment application for submission to the authorities. The capacity of the return water dam to ensure that the dam does not spill more than once in 50 years will be assessed using the Arena model and modelled in dynamic water balance.

Changes in water quality in the Maretlwanespruit were predicted due to potential seepage from the tailings storage facilities and spills from the return water dam by SRK Consulting in 2012. These changes will be compared to existing baseline information for the Maretlwanespruit as well as South African guideline for water uses to determine the significance of these changes and whether additional mitigation measures need to be applied

to the design, operation and maintenance of the tailings storage facilities and the return water dam.

Hydrogeology

A ground water model, was developed for the local ground water regime beneath and adjacent to the proposed TD8 and TD9 sites by SRK Consulting in 2012. The results of this study will be used to assess any changes in ground water quality due to seepage from the tailings, through the proposed liner. The changes in ground water quality will be compared to the existing baseline and to South African guideline for water uses to determine the significance of these changes and whether additional mitigation measures need to be applied to the design and operation of the tailings storage facilities.

7.3.4 Heritage assessment

A Phase I heritage impact assessment by Dr Julius Pistorius, a registered archaeologist and will be included in the EIA. The scope of work is as follows:

- To establish whether any of the types and ranges of heritage resources ('national estate') as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999) do occur in the Lonmin Project Area and if so, to determine the significance of these heritage resources; and
- To make recommendations regarding the mitigation of significant heritage resources that may be affected by the Lonmin Project.

7.4 Public participation during impact assessment

7.4.1 Review of Draft EIA/EMP Amendment and WULA Amendment Reports

Stakeholder engagement during the Impact Assessment Phase revolves around review of the findings of the impact assessment presented in the Draft EIA/EMP Amendment Report and IWUL Amendment report, which will be made available for public comment. Media advertisements will announce the availability of the Draft EIA/EMP Amendment Report and IWUL Amendment report for public comment and registered I&APs will be informed by way of personal letters. Stakeholders will once again be invited to focus group meetings to discuss the report. These details will be confirmed closer to the time. Stakeholders will be invited to comment on the Draft EMP Amendment Report and IWUL Amendment report in any of the following ways:

- By raising comments during focus group meetings where the content of the Draft EIA/EMP Report and IWUL Amendment report will be presented; and
- By completing comments sheets available with the report at public places, and by submitting additional written comments, by email or fax, or by telephone, to the stakeholder engagement office at SRK;

The Draft EIA/EMP Report and IWUL Amendment report will be available for comment for a period of 40 days at public places in the project area, sent to everyone who requests a copy, and placed on the SRK website: www.srk.co.za.

The Final EIA/EMP Report and IWUL Amendment report will be made available for public comment for a period of 21 days in the same manner as the FSR.

The process will be documented in the updated Stakeholder Engagement Process report. All comments and issues raised during the comment period will be added to the CRR that will accompany the Final EIA/EMP Amendment Report.

7.4.2 Announcement of authority decision and right of appeal

Stakeholders will be advised in writing and by way of advertisements in the media, of the authority decision on the EIA and IWUL Amendment , on whether environmental authorisation has been granted to the project or not, and the conditions of each authorisation. If positive, stakeholders will be advised that the environmental authorisation decision may be appealed within 30 days after the date of decision. Notification of the authority decision will be provided as follows:

- A letter will be sent out to all registered I&APs, summarising the authorities' decision and explaining how to lodge an appeal should they wish to; and
- An advertisement to announce the authorities' decision will be published in local newspapers.

7.5 Assessment of impacts

7.5.1 Impact assessment methodology

The environmental impact assessment will be undertaken according to SRK's standard criteria for impact assessment which are detailed below. This methodology is compliant with the NEMA and MPRDA regulations.

All specialists working on the EIA have been asked to use a common, systematic and defensible method of assessing significance that will enable comparisons to be made between impacts across different disciplines. It will also enable all relevant parties to understand the process and rationale upon which impacts have been assessed.

Generally, impact assessment is divided into three parts:

- Issue identification - each specialist will be asked to evaluate the 'aspects' arising from the project description and ensure that all issues in their area of expertise have been identified;
- Impact definition - positive and negative impacts associated with these issues (and any others not included) then need to be defined – the definition statement should include the activity (source of impact), aspect and receptor as well as whether the impact is direct, indirect or cumulative. Fatal flaws should also be identified at this stage; and
- Impact evaluation – this is not a purely objective and quantitative exercise. It has a subjective element, often using judgement and values as much as science-based criteria and standards. The need therefore exists to clearly explain how impacts have been interpreted so that others can see the weight attached to different factors and can understand the rationale of the assessment.

In order to understand the impact evaluation, the sensitivity of the receiving environment, the effect on the receiving environment and the significance of the impacts need to be clearly described. These characteristics are summarised in Table 7-1.

Table 7-1: Characteristics to be used in impact description

Characteristics used to describe consequence	Sub-components	Terms used to describe the characteristic
Type		Biophysical, social or economic
Nature		Direct or indirect, cumulative etc
Status		Positive (a benefit), negative (a cost) or neutral
Phase of project		During pre-construction (if applicable e.g. resettlement), construction, operation, decommissioning/post closure
Timing		Immediate, delayed
Magnitude	**Sensitivity of the receiving environment/ receptors**	High, medium or low sensitivity Low capacity to accommodate the change (impact)/ tolerant of the proposed change
	Severity/ intensity (degree of change measured against thresholds and/or professional judgment)	Gravity/ seriousness of the impact Intensity/ influence/ power/ strength
	Level of stakeholder concern	High, medium or low levels of concern All or some stakeholders are concerned about the change
Spatial extent or population affected The area/population affected by the impact The boundaries at local and regional extents will be different for biophysical and social impacts.		Area/ volume covered, distribution, population Site/Local (social impacts should distinguish between site and local), regional, national or international
Duration (and reversibility) Length of time over which an impact occurs and potential for recovery of the endpoint from the impact		Short term, long term Intermittent, continuous Reversible/ irreversibility Temporary, permanent
Confidence		High, Medium, Low

7.5.2 Impact significance rating

The impact significance rating process serves two purposes: firstly, it helps to highlight the critical impacts requiring consideration in the management and approval process; secondly, it serves to show the primary impact characteristics, as defined above, used to evaluate impact significance.

The impact significance rating system is presented in Table 7-2 and involves four parts:

- Part A: Define impact consequence using the three primary impact characteristics of magnitude, spatial scale/population and duration;
- Part B: Use the matrix to determine a rating for impact consequence based on the definitions identified in Part A;

- Part C: Use the matrix to determine the impact significance rating, which is a function of the impact consequence rating (from Part B) and the probability of occurrence; and
- Part D: Define the Confidence level.

Table 7-2: Method for rating the significance of impacts

Significance of impact (SI) = (magnitude + duration + scale) x probability

Magnitude		Duration		Scale		Probability	
10	Very high Don't know	5	Permanent	5	International	5	Definite Don't know
8	High	4	Long-term (impact ceases after activity)	4	National	4	Highly probable
6	Moderate	3	Medium term (5 – 15 years)	3	Regional	3	Medium probability
4	Low	2	Short term (0 – 5 years)	2	Local	2	Low probability
2	Minor	1	Transient	1	Site only	1	Improbable
1	None					0	None

If SI is

- > 71 = High Environmental Significance

Influences the decision regardless of possible mitigation and may influence whether or not to proceed with the project.

- 41 – 70 = Moderate Environmental Significance

The decision may be influenced unless impact is mitigated. Such impacts need management

- < 40 = Low Environmental Significance

Impacts should not influence the decision and have little real effect, needing little modification of project design or alternative mitigation

- + = Positive Impact.

+ denotes a positive impact.

Using the matrix, the significance of each described impact is initially rated. This rating assumes the management measures inherent in the Project design are in place.

8 Conclusion

The aim of this DSR is to address what issues and alternatives need further investigation, thus informing the scope of the EIA. For this reason a public participation process to inform the IAP's is essential. This report has detailed the description of the proposed project including:

- The proposed locality of the two new tailings storage facilities and associated infrastructure
- Alternatives considered;
- The baseline environmental conditions from previous studies in the area and site visits by the EAP and competent authority;
- The stakeholder engagement process and the results of public participation; and
- Potential impacts and issues.

This DSR sets out the proposed scope of the EIA and EMP that will be undertaken for the proposed project. This includes the range of specialist studies that will be undertaken and their terms of reference as well as the qualifications and experience of the study team.

It is recommended that the DSR is updated with all I&AP comments and submitted to the NWDEDECT and the DMR for approval.

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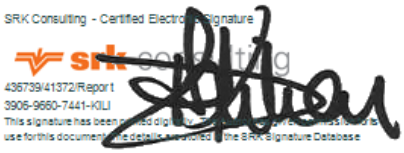

Darryll Kilian

Partner (MA (EGS), CEAPSA, MSAIEES)

All data used as source material plus the text, tables, figures, and attachments of this document have been reviewed and prepared in accordance with generally accepted professional engineering and environmental practices.

Appendices

Appendix A:

Lonmin Charter & Safety and Sustainable Development Policy

Appendix B:
SRK recent project list

Appendix C:
Core Project Team CVs

Appendix D:
Stakeholder Engagement Report

SRK Report Distribution Record

Report No.	436739/DSR01
Copy No.	Website Copy

Name/Title	Company	Copy	Date	Authorised by
D. Mahlaku	DEDECT	1-2	10/04/13	D. Kilian
D. Makamu	DMR	3	10/04/13	D. Kilian
S. Ntsagame	DWA	4	10/04/13	D. Kilian
A Bubu	Bojala DM	5-6	10/04/13	D. Kilian

Approval Signature: