mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

Application for Environmental Authorisation Amendment in terms of Section 31 of the NEMA

Amendment Application Report to extend the existing Mining Right and Environmental Authorisation FS 30/5/1/2/3/2/1 (164) EM to additional portions of the Farm Rietfontein No. 152, Free State Province.

Name of Applicant:	Copper Sunset Sand (Pty) Ltd
Contact Person	Mr. R. Wolter
Tel no:	011 787 9274
Fax no:	011 787 9274
Postal Address:	P.O. Box 413712; Craighall, 2024
File Reference Number SAMRAD:	FS 30/5/1/2/3/2/1 (164) EM

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This document has been prepared by Digby Wells Environmental.

Report Type:	**Regulation 31 Amendment Report in terms of the NEMA EIA Regulations 2014 (as amended)**
Project Name:	**Application for Amendment of the Copper Sunset Environmental Authorisation**
Project Code:	**COP4899**
DMR Reference:	**FS 30/5/1/2/3/2/1 (164) EM**

Name	Responsibility	Signature	Date
Lelani Stolp	Report Compilation		September 2017
Lucy Koeslag	Exco & Legal Review		October 2017

EXECUTIVE SUMMARY

This application entails an amendment of the existing Mining Right and Environmental Authorisation, granted to Copper Sunset Sand (Pty) Ltd (Copper Sunset) to mine sand on portions of the Farm Bankfontein No. 9, Zandfontein No. 259, Rietfontein No. 152 in the Free State Province.

Copper Sunset is the holder of an approved Environmental Management Programme (EMPr) and Mining Right (Reference: FS 30/5/1/2/2/164 MR), as well as Environmental Authorisation (reference number: FS 30/5/1/2/3/2/1 (164) EM) authorising the existing sand quarrying operations.

In order to maximise the present sand resources on site Copper Sunset aims to further extend their Mining Right to include additional areas of the Farm Rietfontein No. 152 which falls within 100m restriction areas as set out in Regulations to the Mine Health and Safety Act, Act 29 of 1996 (GN R 93 of 15 January 1997 and amended). Copper Sunset has been granted approval by the Mine Health and Safety Principal Inspector of Mines to mine within the 100m restriction zones from certain roads, electric pylons and other infrastructure.

The impacts associated with Copper Sunset's mining activities in this area have previously been assessed and therefore the inclusion of the Extension Area would merely result in a change of scope which results in an increased extent of the impacts which was not assessed and included in the original applications as contemplated in Regulation 31 of NEMA.

To mine the extension area, Copper Sunset requires authorisation under the following primary legislation:

- The National Environmental Management Act, 1998 (Act no. 107 of 1998) (NEMA) and the NEMA Environmental Impact Assessment (EIA) Regulations, 2014; and
- The Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA).

It is possible to amend the Existing Mining Right to include additional areas if the Minister consents to such an amendment in terms of Section 102 of the MPRDA. To amend the Environmental Authorisation, the Regulation 31 Amendment process is deemed relevant to include the extension of the mining area.

Copper Sunset intends to continue mining general sand which consists of 90% plaster and 10% building sand. The farm portion to be incorporated lies adjacent to the existing Copper Sunset mining operations as well as the Anglo Operations training centre and coal stockpiles.

The current mining rate for Copper Sunset is about 65 000 m^3 of all general sand per month and this is expected to continue with the addition of the Mining Right extension area, resulting in an additional 9 months of production based on the resource available in the Mining Right extension.

The mining method involves the following:

- Site Clearance (In strips of 30 – 35 m by 100 to 600 m. Vegetation and topsoil, up to 350 mm in depth, will be removed with a bulldozer and stockpiled along the strip earmarked for mining;
- Strip mining with dozers and trucks. The sand will be mined in strips of 30 – 35 m in width and 2.5 – 3 m in depth, and transported off-site by trucks;
- Concurrent rehabilitation will be undertaken, as and when the mined out strips are completed they will be rehabilitated concurrently whilst mining the new mining area. Rehabilitation will consist of the excavations being filled with the stockpiled topsoil and the area will be contoured and levelled to resemble the original landscape and to ensure the site is free draining; although a lowering of the topsoil will be experienced. Spreading of the stockpiled topsoil will be followed by the revegetation of the area with indigenous seed mix.

The Public Participation Process (PPP) is undertaken in compliance with the EIA Regulations, 2014 (as amended). Interested and Affected Parties (I&APs) are afforded a 30 day period to provide comment on this amendment report and the proposed extension. Following this period, this report will be updated with comments received from I&APs, and submitted to the Department of Mineral Resources (DMR) for consideration.

Copper sunset has an existing and approved EMPr. It is proposed that this EMPr be applied to the extension area, as it contains all of the necessary management and mitigation measures to ensure potential impacts of this mining method in this area are managed to acceptable levels of severity.

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1 Introduction

This application entails the amendment of the existing Mining Right and Environmental Authorisation, granted to Copper Sunset Sand (Pty) Ltd (Copper Sunset).

The location of the Project is illustrated in Appendix A, Plan 1 and Plan 2.

Copper Sunset is the holder of an approved Environmental Management Programme (EMPr) and Mining Right (Reference: FS 30/5/1/2/2/164 MR) to mine sand on the Bankfontein Farm, Free State Province. The original Mining Right and Environmental Management Plan (EMP) were approved in 2009.

In 2015, Copper Sunset applied to extend its Mining Right to incorporate a portion of the remaining extent of the Farm Zandfontein No. 259; a portion of the remaining extent of the Farm Bankfontein No. 9; and a portion of the Farm Rietfontein No. 152 which are all adjacent farms to its original Mining Right. This application has since been approved, under Environmental Authorisation reference number: FS 30/5/1/2/3/2/1 (164) EM.

Copper Sunset applied in 2016 for a further extension of their mining right area to incorporate an additional portion of the farm Rietfontein No. 152. The Department of Mineral Resources (DMR) granted environmental authorisation for the second extension area on 20 December 2016 (Reference number: FS 30/5/1/2/3/2/1 (164) EM).

Copper Sunset has been granted approval by the Mine Health and Safety Principal Inspector of Mines to mine within the 100m restriction zones from certain roads, electric pylons and other infrastructure (See Appendix E) as set out in Regulations to the Mine Health and Safety Act, Act 29 of 1996 (GN R 93 of 15 January 1997 and amended). Accordingly Copper Sunset wishes to extend the Mining Right Area to include these additional portions of land on the Farm Rietfontein No.152. The intention of the Application is to maximise the mineral resource and to further extend the Life of Mine. Anglo Operations Proprietary Limited (New Vaal Colliery), the current landowner has consented to provide Copper Sunset access to the land for their proposed mining operation. The proposed extension is illustrated in Appendix A, Plan 3.

2 Terms of Reference

For Copper Sunset to mine the extension area, they require authorisation under the following primary legislation:

- The National Environmental Management Act, 1998 (Act no. 107 of 1998) (NEMA) and the NEMA Environmental Impact Assessment (EIA) Regulations, 2014; and
- The Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA).

Section 102 of the MPRDA reads as follows:

> *A reconnaissance permission, prospecting right, mining right, mining permit, retention permit, technical corporation permit, reconnaissance permit, exploration*

> *right, production right, prospecting work programme, exploration work programme, production work programme, mining work programme environmental management programme or an environmental authorisation issued in terms of the National Environmental Management Act, 1998, as the case may be,* may not be amended or varied (including by extension of the area covered by it *or by the additional of minerals or a shares or seams, mineralised bodies or strata, which are not at the time the subject thereof) without the written consent of the Minister.*

Therefore it is possible to amend the Existing Mining Right to include additional areas if the Minister consents to such an amendment.

Regulation 31 of the NEMA EIA Regulations, 2014 (GN R 982) (as Amended by GN R 326 of 7 April 2017) provides that

> "*An environmental authorisation may be amended by following the process prescribed in this Part if the amendment will result in a change to the scope of a valid environmental authorisation where such change will result in an increased level or nature of impact where such level or nature of impact was not-*
>
> > *a) Assessed and included in the initial application for environmental authorisation; or*
> >
> > *b) Taken into consideration in the initial environmental authorisation;*
>
> *and the change does not, on its own, constitute a listed or specified activity."*

The impacts associated with Copper Sunset's mining activities in this area have previously been assessed and therefore the inclusion of the Extension Area would merely result in a change of scope which results in an increased extent of the impacts which was not assessed and included in the original applications.

Therefore, the Regulation 31 Amendment process is deemed relevant to the proposed expansion project.

Regulation 32(1) (a) of the NEMA EIA Regulations 2014 (GN R 982) (as Amended by GN R 326 of 7 April 2017) sets out the required contents of an Amendment Report. This Report addresses the requirements of Regulation 32(1) (a) of the EIA Regulations as summarised in Table 2-1.

Table 2-1: Contents of this Report according to the EIA Regulations

No	Requirement	Section of this Report
32(1) (a)	The applicant must within 90 days of receipt by the competent authority of the application made in terms of regulation 31, submit to the competent authority (a) a report, reflecting—	

No	Requirement	Section of this Report
(i)	an assessment of all impacts related to the proposed change	Please see Section 8: Impacts Associated with the Proposed Change
(ii)	advantages and disadvantages associated with the proposed change	Please see Section 9: Advantages and Disadvantages of the Proposed Change
(iii)	measures to ensure avoidance, management and mitigation of impacts associated with such proposed change	Please see Section 10: Measures to Ensure Avoidance, Management and Mitigation of Impacts Associated with the Proposed Change
(iv)	any changes to the EMPr	Please see Section 11: Impacts to be mitigated in their respective Phases
(aa)	which report— (aa) had been subjected to a public participation process, which had been agreed to by the competent authority, and which was appropriate to bring the proposed change to the attention of potential and registered interested and affected parties, including organs of state, which have jurisdiction in respect of any aspect of the relevant activity, and the competent authority, and	Please see Section 12: Details of the public participation process followed
(bb)	reflects the incorporation of comments received, including any comments of the competent authority	

In addition to the required content listed above, this report provides details of the Applicant, the Environmental Assessment Practitioner, the policy and legislative context relating to Copper Sunset's activities and details of the existing and proposed Project.

3 Details of the Project Applicant

This application serves to apply for amendment of the existing Mining Right and Environmental Authorisation, granted to Copper Sunset Sand (Pty) Ltd (Copper Sunset). (Reference Number FS 30/5/1/2/2/164 MR).

Existing Approvals are included in Appendix E.

Name of person to whom the environmental authorisation was issued:	Copper Sunset Sand (Pty) Ltd		
Contact person:	Mr. R. Wolter		
Postal address:	P.O. Box 413712; Craighall, 2024		
Telephone:	011 787 9274		
E-mail:	rudiw@mweb.co.za	Fax:	011 787 9274

4 Details of the EAP

Digby Wells Environmental was appointed by Copper Sunset to facilitate the Regulation 31 Amendment Application Process.

Table 4-1: Contact details of the EAP

Name of Practitioner:	Lelani Stolp
Telephone:	011 789 9495
Fax:	011 069 6801
Email:	Lelani.stolp@digbywells.com

4.1 Expertise of the EAP

Lelani Stolp started her career as an environmental consultant in 2008. She has an Honours degree in Environmental Management from UNISA, which she completed whilst working as an environmental consultant following the successful completion of a BSc Degree in Landscape Architecture from the University of Pretoria. She has also successfully completed the SABS Short-course: Environmental Legal Requirements for ISO 14001 compliance.

Lelani's project experience covers various aspects of development including residential developments, filling stations and depots, infrastructure and mining projects. Her experience includes environmental authorization processes such as Basic Assessments, Environmental Impact Assessments, Environmental Management Plans and Programmes, Mining Right

Applications, Water Use Licensing, Concept (Fatal Flaw), Pre-Feasibility and Feasibility Studies. The following is a summary of her employment history:

- January 2016 – present: Digby Wells Environmental – Environmental Consultant.
- April 2015 – December 2015: Mills & Otten Environmental Consultants – Environmental Consultant
- November 2009 – March 2015: Exigo Sustainability – Environmental Consultant
- May 2008 – October 2009: Eco Consult Inc. – Environmental Consultant
- May 2008 – October 2009 (Part Time): E-Scape Landscapes CC – Landscape Technologist
- February 2006 – November 2006 (Part Time): PKA International Architects – Draftsperson

4.2 Declaration of independence

Digby Wells Environmental (South Africa) (Pty) Limited

t/a Digby Wells Environmental

Contact person: Lelani Stolp

I, Lelani Stolp as duly authorised representative of Digby Wells Environmental, hereby confirm my independence, and the independence of Digby Wells Environmental and declare that neither I nor Digby Wells Environmental have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of Copper Sunset Sand (Pty) Ltd, other than fair remuneration for work performed, specifically in connection with the Regulation 31 Amendment Process for the proposed expansion of the Copper Sunset Mining Area, Free State Province.

Full name:	Lelani Stolp
Title/ Position:	Environmental Consultant
Qualification(s):	BSc (Hons) Environmental Management
Experience (years):	9

5 Description of the Property

Copper Sunset is the holder of an approved EMPr and Mining Right (Reference: FS 30/5/1/2/2/164 MR) to mine sand on the Bankfontein Farm, Free State Province.

The DMR approved Environmental Authorisation for Copper Sunset to also mine sand on a portion of the remaining extent of the Farm Zandfontein No. 259; a portion of the remaining extent of the Farm Bankfontein No. 9; and a portion of the Farm Rietfontein No. 152. These portions are all adjacent farms to the Copper Sunset original Mining Right

Copper Sunset now wishes to further extend their Mining Right as illustrated in Appendix A, Plan 3. Details of the proposed extension area are provided in Table 5-1.

Table 5-1: Description of the Property

Farm Name(s):	The proposed Mining Right extension area is for a portion of the Farm Rietfontein No. 152.
Application Area (Ha):	21.28 Hectares
Magisterial District:	Magisterial District of Vereeniging. Fezile Dabi District Municipality of the Free State Province
Distance and direction from nearest town:	Vereeniging is located approximately 11 km to the north Sasolburg is at an approximate distance of 13 km to the north west
21 digit Surveyor General Code for each farm portion:	Farm Rietfontein No. 152 (F01600000000015200000).

5.1 The Environmental Attributes Associated with the Site

Baseline information contained in this section of the Report was obtained from the previous EIA/EMP Reports undertaken for Copper Sunset at their existing mining operation. These reports include:

- Basic Assessment Report And Environmental Management Programme for Listed Activities Associated with Mining Activities Environmental Authorisation in Support of the Mining Right Application for Portions of the Farm Rietfontein 152, Digby Wells, July 2016;
- Copper Sunset Sand Environmental Impact Assessment and Environmental Management Programme Report, Digby Wells, June 2014; and
- Environmental Management Programme Amendment for Copper Sunset Trading, Digby Wells, October 2010.

Please note that individual specialist reports were not produced for this amendment application process. Specialist input was provided for previous reports on areas including and immediately adjacent to the proposed extension area. The information contained in the previous specialist report are deemed relevant to the proposed extension area as the proposed extension comprises the same farm portion, including areas that were previously excluded from the Application due to the buffer zones implemented in terms of the Mine Health and Safety Act, 1996 (Act No. 29 of 1996) (MHSA).

The description of the baseline environment associated with the proposed extension area and its surroundings is relevant to the decision-making process, as it enables an understanding of how the proposed expansion can change or impact on the existing environment. The baseline considered all study areas including:

- The ***regional study area*** - This area was defined as the Fezile Dabi District Municipality (FDDM). Where necessary, the regional study area was extended outside the boundaries of the district municipality;
- The ***local study area*** – This area was defined as the immediate surrounding properties / farms, as well as the affected Metsimaholo Local Municipality (MLM); and
- The ***site-specific study area*** –This area was defined as the extent of the farm portions, of the proposed study area including any buffer areas around the study area that may be required.

5.1.1 Climate

The climatic data presented in this section was sourced from the Basic Assessment Report and Environmental Management Programme for Portions of the Farm Rietfontein 152 compiled by Digby Wells in July 2016.

The project area falls under the Moist Highveld Grassland climatic zone (Kruger, 2004). The region is characterised by cold, dry winters from April to September and warm, wet summers. Data from the Automatic Weather Station (AWS) operated by the South African Weather Service was utilised to determine the meteorological conditions in the Project area. The data covers the period January 2013 to March 2014.

5.1.1.1 Rainfall

The Mean Annual Precipitation (MAP) for this area is approximately 585 mm with the highest rainfall occurring between October and March. The winter months (June to August) contribute very little (4%) to the annual rainfall for this area. Figure 5-1 shows the rainfall for the project area for the period January 2013 to March 2014 obtained from the Vereeniging AWS. Most rainfall in this area is received from December to April. For the period January 2013 to March 2014, the highest monthly total rainfall of 130 mm was measured in April and no rainfall was measured for the months of June, July and September 2013.

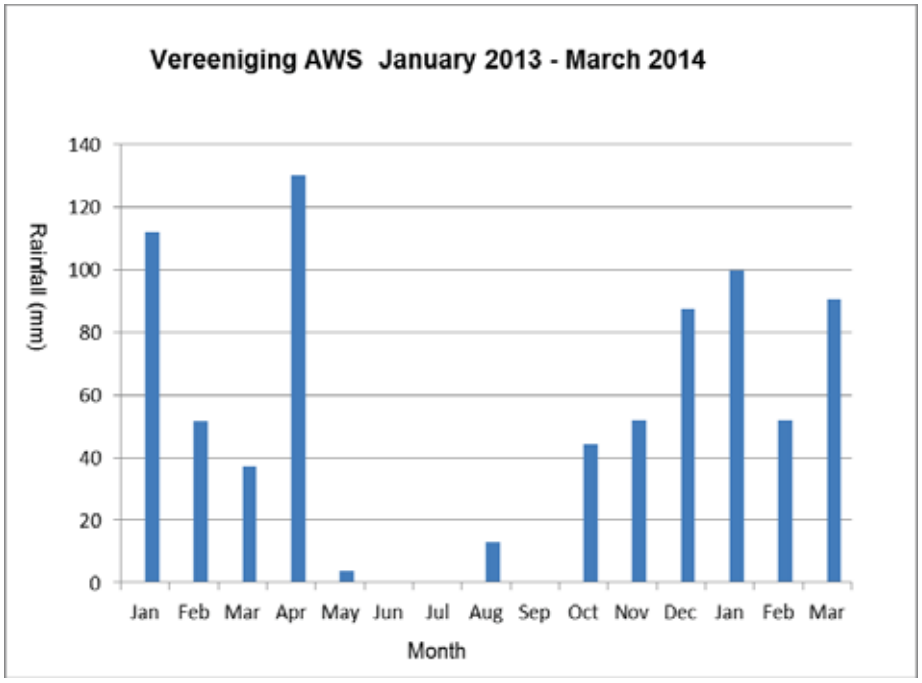


Figure 5-1: Average Monthly rainfall derived from the Vereeniging AWS Jan 2013 – March 2014

5.1.1.2 Temperature

Temperatures for the area are consistent with the Northern Free State climatic zone, with warm summers and cool dry winters. Average temperatures range from 28°C in the summer to lows of -1°C in the winter. The monthly maximum and average temperature plot for the area between January 2013 and March 2014 is depicted in Figure 5-2. The monthly maximum temperature ranges from 29.4°C in February 2013 to 19. 8°C in July 2013. The average temperature ranges from 15.9°C in January to 0.5°C in June.

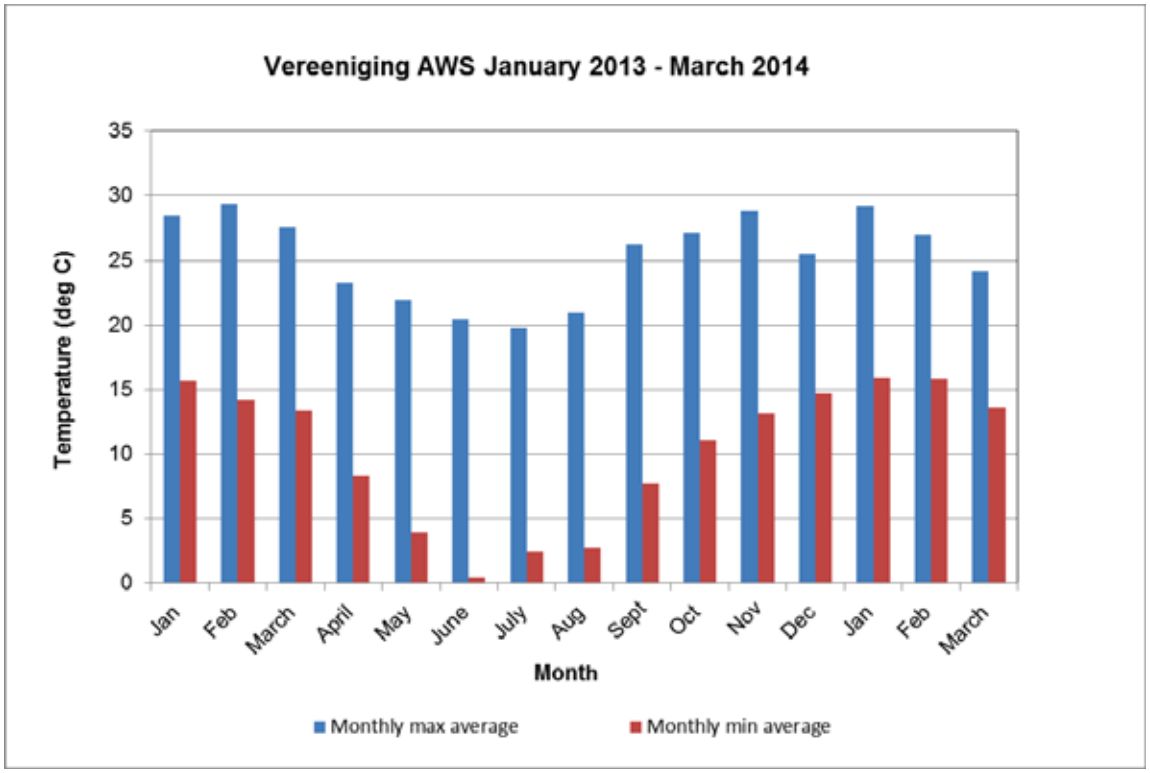


Figure 5-2: Average monthly temperature derived from the Vereeniging AWS Jan 2013 – March 2014

5.1.1.3 Relative Humidity

Figure 5-3 depicts the relative humidity for the project area from January 2013 to March 2014. The average relative humidity ranges between 48% (March 2014) and 17% (September 2013). The monthly maximums were higher than 70% for the period under survey, except in September (59%).

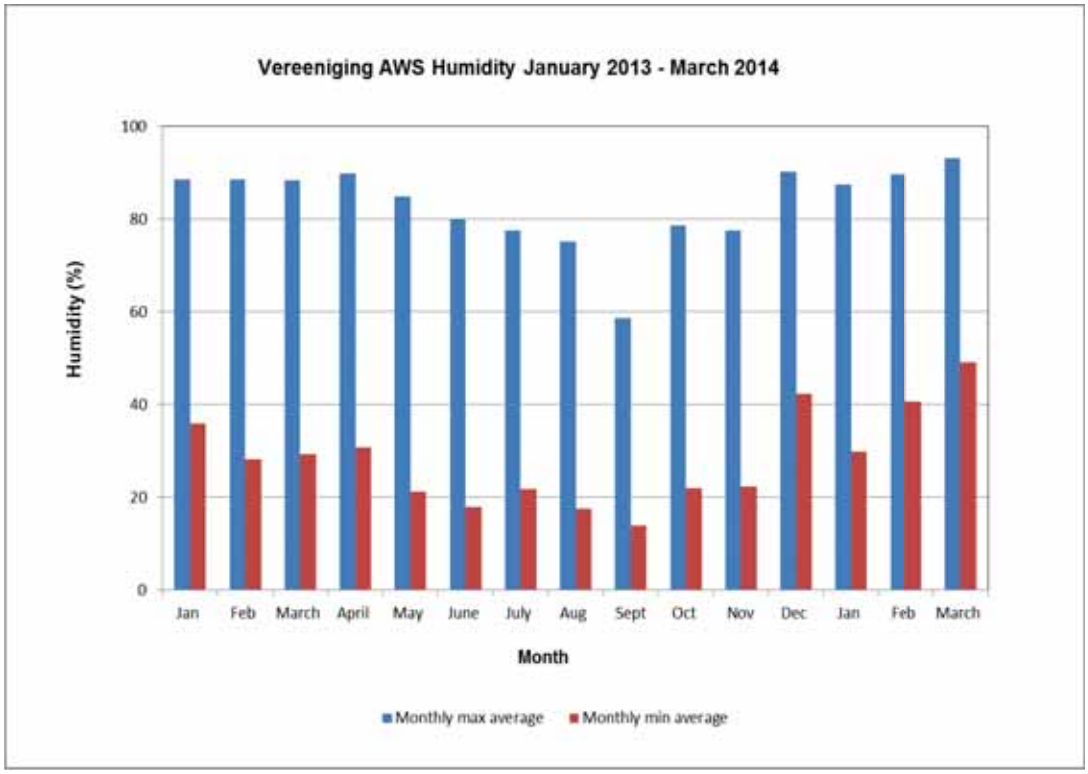


Figure 5-3: Average monthly humidity derived from the Vereeniging AWS Jan 2013 – March 2014

5.1.1.4 Wind Characteristics

Dispersion of atmospheric pollutants is a function of the prevailing wind characteristics at any site. The wind speed determines both the distance of downward transport and the rate of dilution of pollutants. The generation of mechanical turbulence is similarly a function of the wind speed, in combination with the surface roughness.

The amount of particulate matter generated by wind is highly dependent upon the wind speed. Below the wind speed threshold for a specific particle type, no particulate matter is liberated, while above the threshold, particulate matter liberation tends to increase with the wind speed. The amount of particulate matter generated by wind is also dependent on the material's surface properties. This includes whether the material is crusted, the amount of non-erodible particles and the particle size distribution of the material.

Wind roses were developed using data from the Vereeniging AWS, for the period January 2013 to December 2014. The predominant wind direction is from the north northwest and north, with frequent winds also occurring from the north east and west. Over the assessment period, frequency of occurrence was 12% from the north northwest, 11% from the north and 8% from the northwest sector. Less frequent winds (under 2% of the time) were coming from the south-south east and south. Calm conditions (wind speeds < 0.5 m/s) occurred for 9.2% of the time. Figure 5-5 shows the seasonal variation of the wind directions.

The predominant wind direction is similar in spring, winter and autumn. During the summer season (December to February) the predominant wind directions are from the north northwest and north.

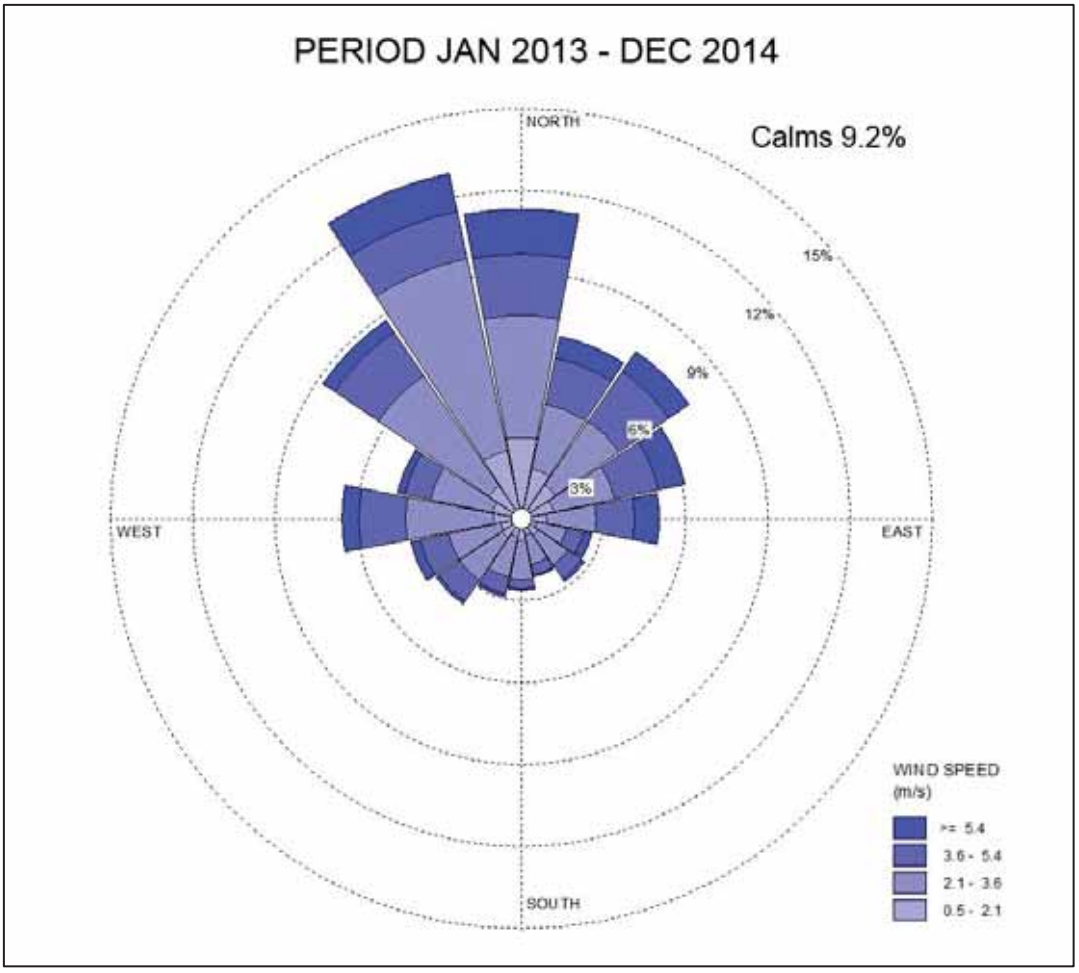


Figure 5-4: Period surface wind rose from Copper Sunset Mining Area, 01 January 2013 – 31 March 2014

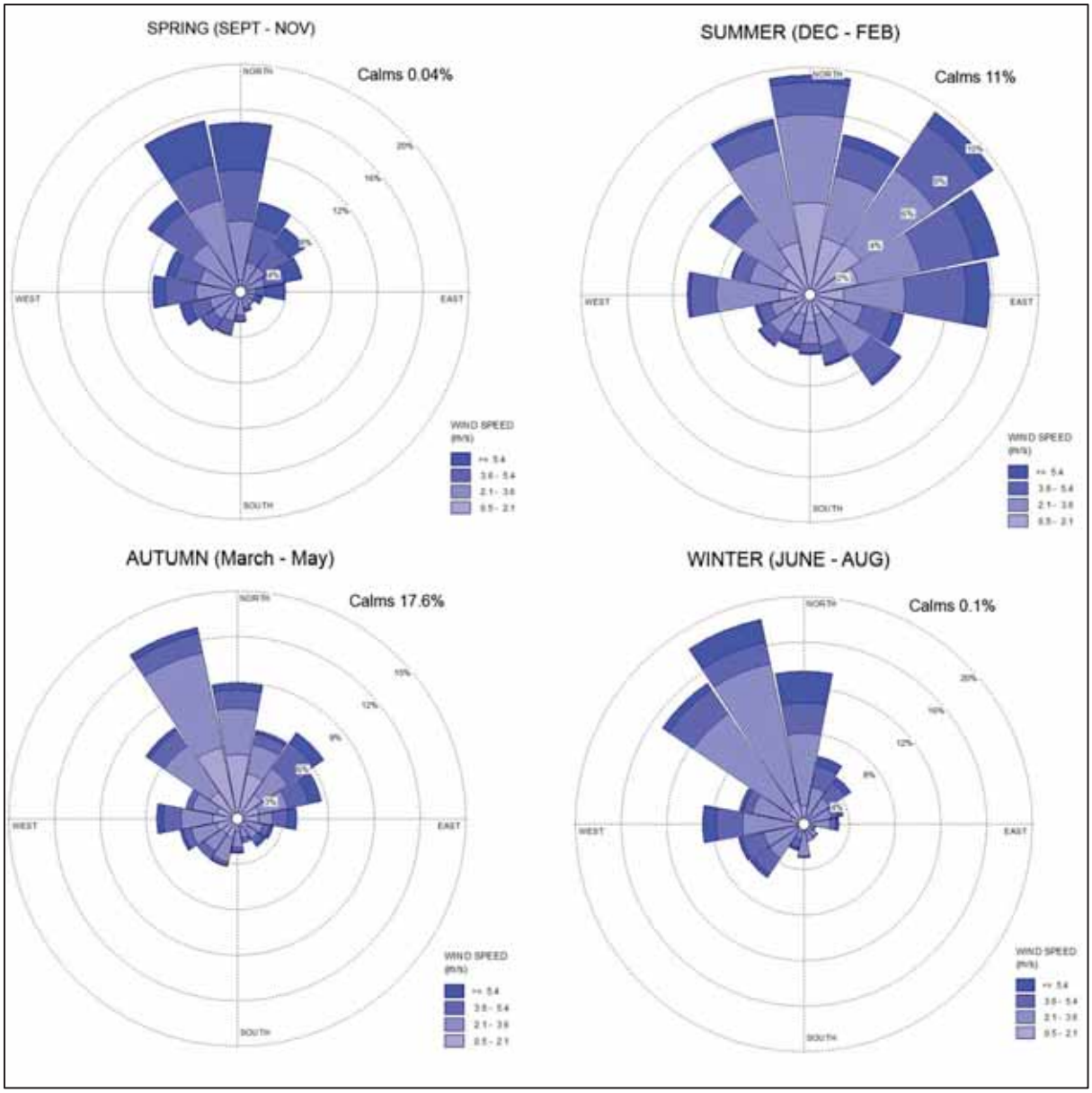


Figure 5-5: Seasonal variation of winds in spring (Sept – Nov) (top left); summer (Dec – Feb) (top right); autumn (March – May) (bottom left); and winter (June – August) (bottom right), Vereeniging AWS 01 January 2013 – 31 March 2014

The wind class frequency for the area indicates that wind speed greater than 5.4 m/s capable of generating dust occurred for approximately 9.3% of the time with calm winds observed for approximately 10% of the time. Much of the winds measured in the area were between 2.1 and 3.6 m/s. Windy periods indicated between winter and spring with only 0,1% and 0,04% calms respectively.

5.1.2 Topography and Visual Resource

The study area is characterised by flat topography with no significant topographical features such as hills, ridges or water courses. Mining and agricultural activities dominate the surrounding area and have impacted the local topography. The main visual receptors include the Anglo New Vaal Colliery's Community centre which is located approximately 500 m south west of the site and Viljoensdrif community approximately 1 km north west of the study area. The R716 road lies between the site and Viljoensdrif community. The Eskom Lethabo Power Station is located approximately 8 km to the east of the proposed mining area and is visible from the site, as well as various electricity transmission infrastructures.

No infrastructure will be constructed at the Mining Right extension area.

Figure 5-6: General view of the state of the environment (photographs taken from the July 2016 BA Report)

5.1.3 Geology

The Mining Right extension lies within the Vryheid Formation that forms part of the Ecca Group which is part of the Karoo Supergroup. The Vryheid Formation consists predominantly of thick beds of yellowish to white cross-bedded sandstone and grit alternating with beds of soft sandy shale. The geology of the area contains coal seams that support the coal mining activities of the adjacent properties (although all coal in the area of interest has been

completely mined out). Dolerite sheets and dykes have intruded the sedimentary rocks extensively in the Formation. Refer to Plan 4, Appendix A.

5.1.4 Soil, Land Capability and Land Use

Existing Land Type data was used to obtain generalised soil patterns and terrain types for the project site. Land Type data exists in the form of published 1:250 000 maps. These maps indicate delineated areas of similar terrain types, pedosystems (uniform terrain and soil pattern) and climate (Land Type Survey Staff, 1989). These maps are general guidelines of what soils can be expected in the area.

The general terrain is flat and the soils are derived from Aeolian sand moved in over local colluvium derived from Ecca sandstone. According to a soils study completed for the previous expansion on the adjacent property, the soils were found to extend further than 1.2 m deep (Jackson, 2014). Groundwater studies completed for the New Vaal Colliery approximately 1 km south of the site specific study area found that the alluvium of fine sand extends 6 m deep (Golder Associates, 2012). The Land Type has been defined as Upland Duplex and/or Margalithic soils (Ca1) (Jackson, 2014).

The local study area is situated within the Grassland Biome with a relatively flat topography (Mucina & Rutherford, 2006). The natural veld that would mainly consist of *Cymbopogon plurinodis* and *Cynodon dactylon* is greatly altered through old ploughed areas, plantations, illegal dumping and coal mining. The farms currently belong to Anglo Operations and were previously mined for coal (underground mining). The area is classed as degraded grassland which has been left fallow.

5.1.5 Air Quality

The expanded mining area falls within the Vaal Triangle Airshed Priority Area (VTAPA), which was declared as a priority area and was published in the Government Gazette in terms of Section 18 (1) of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) under Notice No. 365 of 21 April 2006, as amended by Notice 711 of 17 August 2007. VTAPA is the first priority area in South Africa and was declared such due to the concern of elevated pollutant concentrations within the area, specifically particulates.

The Vaal Triangle is a highly industrialised area with numerous industries, coal fired power stations, and various smaller industrial and commercial activities in addition to a number of collieries and quarries. Within the area, there are large informal settlements using coal and woody biomass for cooking and space heating. The area is also home to commercial agricultural activities and a host of other fugitive sources of air pollution, which can have implications on the health and wellbeing of exposed residents in the area.

A dust monitoring network of four different units (single dust buckets) in the vicinity of the proposed project was made available for analysis, during the 2016 BAR Process. Measured results were compared against the current NDCR 2013[1] standard.

The deposition rates observed confirm that the area is within compliance as rates are within the recommended non-residential standards of 1200 mg/m^2/d for the majority of the sampling window. In 2013, the dust deposition rates exceeded the non-residential limit at the following sites: “Behind the wash plant” (November) and “Haul road from quarry” (December).

In 2014, the site “Behind workshop” exceeded the non-residential limit of 1 200 mg/m^2/d. The site “Haul road from quarry” exceeded the residential limit in March and December 2014. The site “Main gate” exceeded the residential limit in July, November and December. The exceedance may be a result of dust generating activities from surrounding mining operations as well as increases in wind speed associated with dry season and low calms.

In 2015, deposition rates at the sites were all within the non-residential limit (1 200 mg/m^2/d). However, the sites “At main gate” and “Haul road from quarry” recorded deposition rates higher than the residential limit of 600 mg/m^2/d. The exceedances recorded were not in consecutive months. According to dust fallout standards, permissible exceedance is twice within a year but not in sequential months.

5.1.6 Noise

According to the Free State Noise Control Regulations “disturbing noise” means a noise level that exceeds the ambient sound level measured continuously at the same measuring point by 5 dBA or more.

Baseline noise in the project area was measured and interpreted during the 2016 BAR Process, using the Free State noise control regulations as published under PN24 of 1998 (PG 35 of 24 April 1998) in terms of Section 25 of the Environmental Conservation Act, 1989 (Act 73 of 1989) as well as guidelines provided by SANS 10103:2008.

Previous environmental noise studies undertaken at the Copper Sunset Mine indicated that the main noise sources contributing to the ambient daytime and night-time noise levels are the sirens and conveyer belts at the coal stockyard as well as the occasional railway noise.

Based on the daytime results measured at Anglo Coal New Vaal Colliery’s Community Centre, the ambient noise levels were mostly below the SANS rating levels for the maximum allowable outdoor daytime limit for ambient noise in industrial districts as well as below the daytime limit for ambient noise in suburban districts. Acceptable levels are shown in Table 5-2.

[1] National Environmental Management: Air Quality Act, 2004 (Act.39 of 2004) - National Dust Control Regulation (NDCR, 2013)

According to the Free State Noise Control Regulations "disturbing noise" means a noise level that exceeds the ambient sound level measured continuously at the same measuring point by 5 dBA or more.

The results from the noise meter recordings for all the sampled points during the 2016 study as well as the rating limits according to the SANS 10103:2008 guidelines are presented in Table 5-2.

Table 5-2: Average Noise Levels

Sample ID	SANS 10103:2008 rating limit					
	Type of district	Period	Acceptable rating level dBA	$L_{Areq,T}$ dBA	Maximum/Minimum dBA	Date
N1	Suburban	Daytime	50	48	78 / 35	01/10/2012
		Night time	40	52	73 / 46	01/10/2012
	Indicates current $L_{Aeq,T}$ levels above either the daytime rating limit or the night time rating limit					

Based on the night time results, the existing ambient noise levels are mostly below the SANS rating levels for the maximum allowable outdoor night time limit for ambient noise in industrial districts but above the night time limit for ambient noise in suburban districts.

5.1.7 Fauna and Flora

The study site is seen to consist of degraded grassland, primarily as a result of anthropogenic impacts. The general study area (including outside the borders of the study site) includes extensive farmland and mining, with associated houses and buildings.

It is important to note that despite the somewhat disturbed nature of the site, the grassland areas form important habitat for species such as rodents and moles, and form process areas that are vital to the functioning of the ecosystem. There are two main vegetation types (Appendix A, Plan 5) forming the degraded areas, these are grassland type 1 and grassland type 2, which are described in Table 5-3.

Table 5-3: Vegetation Types found in the Proposed Project Area

Vegetation type	Description	Dominant and Notable Species
Vegetation type 1	This grassland was found inside the semi-circular mound. In general grasslands tend to be quite degraded throughout the area with	*Eragrostis curvula* *Themeda triandra*

	low species of diversity and richness and many species commonly associated with impacted areas. Despite this they contain some provincially protected species and it is suspected that more may be found	*Digitaria eriantha* *Serphium plumosum* *Aristida junciformis* *Sporobolus africanus* *Panicum schinzii* *Enneapogon cenchroides*
Vegetation type 2	This vegetation unit was found outside of the semi-circular earth mound. In this vegetation type many small areas where encountered where water collects. These areas had a higher clay percentage than the remaining grassland. The remaining areas were sandier with the species composition reflecting this.	*Andropogon appendiculatus* *Aristida congesta congesta* *Enneapogon cenchroides* *Melinis repens* *Imperata cylindrica* *Themeda triandra*

One Species of Special Concern (SSC), a protected plant species was encountered in the study area, *Boophone disticha* or Poison Bulb. This species is listed as Declining under the national Red Data species list and is also provincially protected. As a consequence, if it is encountered, it should not be removed.

No mammal species were found to be of concern. No red data bird species have been identified. No reptiles or amphibians of special concern have been identified on the site.

The extension site is not in close proximity to any protected areas. The proposed area also does not fall within or close to any Important Bird Areas (IBA). There are no areas within 50 km of the proposed development that are earmarked for conservation under the National Protected Areas Expansion Strategy (NPAES).

The study area occurs within a vulnerable ecosystem, the Central Free State Grassland (Appendix A, Plan 6).

5.1.8 Wetlands

A wetland area covering 2.8ha has been delineated on the Copper Sunset Mining Area. The wetland delineation report is included as Appendix G. The location of the wetland in relation to the approved and proposed mining areas is illustrated in Appendix A, Plan 7. The wetland has formed artificially due to prolonged inundation due to outflow from the culvert leading into it. As a result of extended periods of saturation, wetland plant species such as: *Typha capensis* (Common Bulrush) and *Juncus effuses* (Common Rush) have established.

Since the wetland has formed due to artificial conditions, it does not represent an area of any particular ecological sensitivity or importance. Much of the vegetation was comprised of alien species and there was evidence of erosion, channelization and excessive sedimentation. The following scores were assigned to the wetland:

- PES[2]: E – Critically modified, and
- EIS[3]: 4 – Low importance and sensitivity.

There is a National Freshwater Ecosystem Priority Area (NFEPA) wetland to the south western edge of the Mining Right extension area; the R716 road separates the wetland from the Mining Right extension area.

5.1.9 Surface Water

The mining area (approved and proposed) is located in the Upper Vaal Water Management Area (WMA 08) within quaternary catchment C22F.

The surface water attributes of the affected catchments, namely Mean Annual Runoff (MAR), Mean Annual Precipitation (MAP) and Mean Annual Evaporation (MAE) are summarised in Table 5-4 which indicates a ratio of precipitation to evaporation at 40 %, with 3 % of the rainfall becoming runoff (WRC, 2005).

Table 5-4: Summary of the Surface Water Attributes of the C22F Quaternary Catchment

Quaternary Catchment	Total Area (km2)	Rainfall Zone	MAP (mm)	MAR (mm)	MAR m3* 106	Evaporation Zone	MAE (mm)
C22F	440	11A	655	20.5	9.04	C2C	1650

Source: WRC, 2005

There are no rivers or streams within or in proximity to the existing or proposed expanded mining area. The closest river is the Vaal River approximately 4 km east of the site. The Taaibosspruit is situated in excess of 6 km to the south west of the proposed expanded mining area and is a tributary of the Vaal River.

The 1:50 year flood line of the Vaal River in the catchment is situated on the 1 434 mamsl contour line, with the expanded mining area being located at 1 450 mamsl. The mining of the expanded area will, therefore, fall outside of the 1:50 year flood line, as determined by Randwater (EMP Amendment, 2010).

5.1.10 Groundwater

Two aquifer types occur in the Vryheid formation. The upper weathered aquifer consists of transported or in-situ weathered material and is between 5 – 12 m thick. The other aquifer is

[2] Present Ecological State

[3] Ecological Importance and Sensitivity

the lower fractured Karoo aquifer which includes the underlying Ecca sediments, this aquifer is recharged by the interflow from the weathered aquifer.

The regional groundwater levels vary from approximately 5 m below the surface in the lower lying areas to a maximum of 22 m below the ground. Groundwater yields are classed as low, with 83% of boreholes on record producing less than 2 l/s in the Vryheid Formation.

The quality of regional groundwater is indicated by the average electrical conductivity value of 57 mS/m and a mean pH of 7.5. There is however, significant variation in concentrations of sodium, chloride and sulphate which indicates contamination by the surrounding coal mining activities.

5.1.11 Socio-Economic Environment

The site is located in the Metsimaholo Local Municipality (MLM) in the Fezile Dabi District Municipality (FDDM) in the Free State Province.

The Free State Province has a total population of 2,745,590. MLM has a total population of 149,108 (http://www.statssa.gov.za). Key statistics as sourced from Stats SA and the MLM Integrated Development Plan (IDP) 2017 – 2022 are presented in Table 5-5.

Table 5-5: Key Statistics for the MLM

Category	Key Statistic MLM (Stats SA)	Key Statistic MLM (IDP)
Total Population	149,108	163,564
Young (0 - 14)	26.30%	23.74%
Working Age (15 - 64)	69.30%	70.99%
Elderly (65+)	4.40%	5.25%
Growth Rate	2.51%	2.10%
Population density	87 persons/km^2	95 persons/km^2
Unemployment rate	32.10%	
Number of Households	45,757	59,113
Average Household Size	3.10	2.80

The MLM Integrated Development Plan (IDP) 2017 – 2022 states that “although a fairly accurate indication can be given of the urban population, data regarding the rural population

is mostly unreliable due to various dynamic demographic factors in the region. Pertinent factors influencing demographic data in rural areas, within the Fezile Dabi Region, include:

- Cross provincial boarder Influx generally to the Sasolburg / Deneysville areas due the existing mining activities and its close proximity to the industrial areas of Vereeniging and Vanderbijlpark.

The IDP also acknowledges the importance that Mining Activities has in the region in terms of job creation and economic development.

While mining and industry dominate the Sasolburg and Deneysville areas of the municipality, agricultural activities tend to dominate the remainder of the region. A fairly significant portion of the area is currently under cultivation, which is attributed to the availability of water for irrigation purposes. Maize, sunflowers and sorghum tend to be the predominant plant crops grown in the area. Stock farming in the region focuses on grazing and dairy farming.

5.1.12 Heritage

The cultural baseline is based on information sources such as previous Heritage Impact Assessments conducted in the area, databases and cartographic resources.

The cultural landscape of the regional and local study area can be categorised by the occurrence of Early Stone Age (ESA), Middle (MSA) and Late Stone Age (LSA) accumulations, and historical settlements including the town of Vereeniging and surrounding farming communities.

Previous heritage surveys undertaken on properties adjacent to the proposed extension area did not reveal the presence of any heritage resources.

According to the SAHRIS PalaeoSensitivity Map, the site specific area is located in an area of very high palaeontological sensitivity as depicted. The Madzaringwe Formation is highly significant due to the potential for *Glossopterid* coal flora fossils within the formation.

The soils of the site specific project extend between 1.2 m and 6 m deep. Taking this into consideration, the Madzaringwe Formation is assumed to be deeper than the proposed 3 m depth of the mining activities and will not be impacted on.

6 Description of the activities to be undertaken

Copper Sunset intends to continue mining general sand which consists of 90% plaster and 10% building sand. The areas to be incorporated lies adjacent to the existing Copper Sunset mining operations as well as the Anglo Operations training centre and coal stockpiles. These areas were previously excluded as they comprise buffer areas around certain infrastructure as prescribed by the MHSA. Copper Sunset has been granted approval by the Mine Health and Safety Principal Inspector of Mines to mine within the 100m restriction zones from certain roads, electric pylons and other infrastructure.

The current mining rate for Copper Sunset is about 65 000 m^3 of all general sand per month and this is expected to continue with the addition of the Mining Right extension area, resulting in an additional 9 months of production based on the resource available in the Mining Right extension.

The mining method will be strip mining due to the shallow depth of the deposit and dozers and trucks will be used to mine the sand. The sand will be mined in strips of 30 – 35 m in width and 2.5 – 3 m in depth.

6.1 Establishment Phase

During the establishment phase of the proposed project, the activities below are foreseen to be undertaken:

- Development of access roads: Copper Sunset will make use of existing roads to access the proposed extension area. The area can be accessed from one of three existing roads, located north, south and west of the proposed extension area. Access routes / tracks will then be created from this existing road to the mined strip; the length and width of these tracks will be less than 5 m. The length will be dependent on the area to be mined but approximate lengths are in the region of 180 – 600 m; and

- Site Clearance (In strips of 30 – 35 m by 100 to 600 m with a cumulative clearance of less than 20 ha): Vegetation and topsoil, up to 350 mm in depth, will be removed with a bulldozer and stockpiled along the strip earmarked for mining.

6.2 Operations Phase

The operation will make use of a fleet of bulldozer, wheel loaders, excavators, graders, articulated trucks, tipper trucks and a tractor loader backhoe. No processing or screening plants will be established on the proposed extension area. The processing of sand is a component in the current Mining Right held by Copper Sunset. The mined sand will be transported in trucks away from the Mining Right extension to the current mining right area which contains the infrastructure to screen the resource.

Concurrent rehabilitation will be undertaken on the mined out strips or excavations. The mined out strips will be contoured and the stockpiled topsoil applied and levelled to resemble

the pre-mining landscape. Although the site will be contoured and levelled to resemble the pre-mining landscape, there will be an overall lowering of the topography. Rehabilitation will ensure the site is free-draining.

No waste material will be generated on site as the coarse or oversized screened material will be sold as additional building products to the plastering sand, or backfilled to the mined-out strips. The clean sand will be conveyed to an off take stockpile from where it will be loaded on trucks and delivered to the construction industry. Copper Sunset does not convey the sand off-site themselves: buyers collect the sand products from site and are responsible for the transport thereof.

The operation employs 24 skilled and multi-skilled personnel and this number is not expected to change with the addition of the Mining Right extension. The extension is intended to extend the Life of Mine.

Domestic waste is currently transported and dumped at the Sasolburg Municipality dumping site with permission to do so by the local municipality. All used oil is stored in plastic drums in a concrete bunded area and is collected by Nora Oil Recycling (Pty) Ltd on a monthly basis.

Water will be supplied via a borehole, located on the current mining operation area. This borehole is authorised under a current Water Use Licence (WUL) granted to Copper Sunset. It is anticipated that water will only be required for dust suppression on the expansion area.

6.3 Rehabilitation

Concurrent rehabilitation will be undertaken, as and when the mined out strips are completed they will be rehabilitated concurrently to the new mining area.

Rehabilitation will consist of the excavations being filled with the stockpiled topsoil and the area will be contoured and levelled to resemble the original landscape and to ensure the site is free draining; although a lowering of the topsoil will be experienced. Spreading of the stockpiled topsoil will be followed by the revegetation of the area with indigenous seed mix.

6.4 Listed Activities associated with the proposed extension

Table 6-1 indicates the Activities Authorised under Environmental Authorisation FS 30/5/1/2/3/2/1 (164) EM.

It is requested that these already authorised Listed Activities also be authorised on the extension/ application area illustrated in Appendix A, Plan 3.

Table 6-1: Existing Approved Listed Activities

Approved Listed Activities	Description of Activity	Details of the activity
NEMA EIA Regulations 2014 (GN R 983) (Listing Notice 1)	Activity 27 - "The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for i. the undertaking of a linear activity; or ii. Maintenance purposes undertaken in accordance with a maintenance management plan.	Removal of vegetation and topsoil of up to 350mm, stockpile of topsoil and removed vegetation along the strip, access roads of less than 8m wide and approximately 600m long.

Any activity including the operation of that activity which requires a mining right as contemplated in section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) is also regarded as a Listed Activity under the NEMA EIA Regulations, 2014.

Though not specifically listed in the EA FS 30/5/1/2/3/2/1 (164) EM, mining is deemed to be authorised on the subject properties, as an existing and approved EMPr compiled under the MPRDA is applicable to the operations. This application further relates to the extension of the mining and associated activities to the proposed area illustrated in Appendix A, Plan 3.

7 Policy and Legislative Context

From an environmental and social perspective, the proposed project is required to comply with all the obligations in terms of the provisions of the NEMA and MPRDA. The legislative guidelines directing the project are outlined in further detail in Table 7-1.

Table 7-1: Legislation and guidelines applicable to the project

Applicable Legislation and Guidelines used to Compile the Report	How does this Development Comply with the Policy and Legislative Context
Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996) Section 24 of the Constitution provides that everyone has the right to an environment that is not harmful to their health or well-being and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures, that – i. Prevent pollution and ecological degradation; ii. Promote conservation; and iii. Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.	The environmental management objectives of the project will be to protect ecologically sensitive areas and to support sustainable development and the use of natural resources, whilst promoting justifiable socio-economic development. The implementation of the mitigation and management measures to minimise and prevent negative impacts associated with the project, are contained in the Copper Sunset Mine's approved Environmental Management Programme (EMPr), which will remain applicable to the proposed extension area.
Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) In terms of the provisions of Section 102 of the MPRDA, in respect of the proposed amendments to the existing mining right. The applicant must submit an EMP to the DMR and consult with Interested & Affected Parties (I&APs) for comment regarding the Project.	This Report has been compiled in accordance with the requirements of the NEMA EIA Regulations, 2014 (as amended), with the environmental management objective to protect ecologically sensitive areas. This report will be submitted to the DMR, after consultation with I&APs.
National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) The Environmental Impact Assessment (EIA) Regulations, Government Notice Regulation (GN) R.982 were published on 04 December 2014 and promulgated on 08 December 2014. Together with the EIA Regulations, the Minister also published GN R.983 (Listing Notice No. 1), GN R.984 (Listing Notice No. 2) and GN R.985 (Listing Notice No. 3) in terms of sections 24(2) and 24D of the NEMA, as amended.	This Amendment Report has been compiled in accordance with the requirements of the NEMA EIA Regulations (2014) (as amended)

Applicable Legislation and Guidelines used to Compile the Report	How does this Development Comply with the Policy and Legislative Context
National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) The National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) is the overarching legislation that protects and regulates the management of heritage resources in South Africa. The Act requires that Heritage Resources Agency's in this case the South African Heritage Resources Agency (SAHRA) and Provincial Heritage Resources Authority (PHRA), be notified as early as possible of any developments that may exceed certain minimum thresholds.	A Notification of Intent to Develop (NID) has been undertaken in support of an approval in terms of the NHRA. The NID will be attached to the Final Amendment Report as an Appendix.
National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) (NEM:AQA) According to the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) (NEM: AQA) the Department of Environmental Affairs (DEA), the provincial environmental departments and local authorities (district and local municipalities) are separately and jointly responsible for the implementation and enforcement of various aspects of NEM: AQA. A fundamental aspect of the new approach to the air quality regulation, as reflected in the NEM: AQA is the establishment of National Ambient Air Quality Standards (NAAQS). These standards provide the goals for air quality management plans and also provide the benchmark by which the effectiveness of these management plans is measured.	The mitigation and management measures to be implemented as part of the project aim to manage and prevent potential impacts to air quality.
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEM:BA) The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEM: BA) regulates the management and conservation of the biodiversity of South Africa within the framework provided under NEMA. This Act also regulates the protection of species and ecosystems that require national protection and also takes into account the management of alien and invasive species. This Act works in accordance to the framework set under	The mitigation and management measures to be implemented as part of the project aim to manage and conserve biological diversity, as well as to minimise alien invasive species.

Applicable Legislation and Guidelines used to Compile the Report	How does this Development Comply with the Policy and Legislative Context
NEMA. The following regulations which have been promulgated in terms of the NEM:BA are also of relevance: ▪ Alien and Invasive Species Regulations, 2014 published (GN R598 in GG 37885 of 1 August 2014); ▪ Alien and Invasive Species Lists, 2016 published (Published under GN R 864 in *Government Gazette* 40166 of 29 July 2016.; ▪ National Environmental Management: Biodiversity Act, 2004: Threatened and Protected Species Regulations, 2007; and ▪ National list of Ecosystems Threatened and in need of Protection under Section 52(1)(a) of the Biodiversity Act (GG 34809, GN R.1002, 9 December 2012.	
Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) (CARA) CARA aims to provide for the conservation of the natural agricultural resources of the country through the maintenance of the production potential of land, by combatting and preventing erosion and the weakening of water sources. In addition, this Act aims to protect vegetation, while combatting weeds and invader plants	Section 12 of the CARA details the maintenance of soil conservation in which every land user will be responsible for the maintenance and conservation of soil. The mitigation measures recommended as part of the EMPr aim to prevent the compaction, erosion and degradation of the soil resources.
Environmental Conservation Act, 1989 (Act No. 73 of 1989) (ECA) ECA makes provision for guidelines pertaining to noise control and measurements. The regulations make reference to the use of the South African National Standards 10103:2008 (SANS) guidelines for the Measurement and Rating of Environmental Noise with Respect to Land Use, Health, and Annoyance and to Speech Communication.	The proposed project will not exceed the SANS 10103: 2008 limits for baseline noise measurements, thus conforming to the requirements of the ECA.
National Water Act, 1998 (Act No. 36 of 1998) (NWA) NWA makes provision for water resource management, protection of the quality of water	DWS will be engaged regarding the requirement for a WUL or General Authorisation (GA) in respect of S21(c) and (i) water uses. Mitigation and management measures to be implemented as part of the

Applicable Legislation and Guidelines used to Compile the Report	How does this Development Comply with the Policy and Legislative Context
resources and recognising the need for the integrated management of all aspects of water resources to achieve sustainable use of water.	project aim to manage and conserve water quality.
National Environmental Management: Waste Act, 2008 (Act No.59 of 2008) (NEMWA) NEMWA aims to provide regulation for waste management in order to protect health and the environment, for the prevention of pollution and ecological degradation and for securing ecologically sustainable development.	Domestic waste is currently disposed of at the Sasolburg Municipality site with permission from the municipality. Used oil is collected by a licensed recycling Company. NEMWA is not applicable to the extension area however mitigation measures will be implemented for any unintended waste that could cause pollution and contamination to the area.
Mine Health and Safety Act, 1996 (Act No. 29 of 1996) (MHSA) The MHSA imposes certain restrictions in terms of Regulation 17.6(a) that prohibits mining from taking place within 100m from structures.	Copper Sunset received exemption form the requirements of Regulation 7.6(a) from the DMR Mine Health and Safety Sub-Directorate on 02 October 2017. Mining may take place within the following restrictions, according to the exemption: - 40 metres from the R716 tar road; - 17 metres from the private tar road leading to New Vaal Colliery; - 22 metres from Eskom structures; - 16 metres from private road leading to New Vaal training centre; - 50 metres from houses of the training centre located next to the mining operation; - 5metres from unused private tar road leading to the stock yard area; - 22 metres from Eskom private railway line (only being used for importation of lime)

8 Impacts Associated with the Proposed Change

This report relates to the application to extend Copper Sunset's existing and approved mining activities to the adjacent land. The impacts of the mining activity have already been assessed. This section of the Report presents a summary of the impact assessment methodology used and the outcome of the impact assessment undertaken for the existing and approved mining.

The proposed amendment will increase the extent of the anticipated impacts by approximately 20ha.

No physical construction will take place as no permanent infrastructure will be established on the project site.

8.1 Impact Assessment Methodology

The methodology used to assess the significance of potential social and heritage impacts is described below. The significance rating formula is as follows:

Significance = Consequence x Probability

Where

Consequence = Type of Impact x (Intensity + Spatial Scale + Duration)

And

Probability = Likelihood of an Impact Occurring

In addition, the formula for calculating consequence:

Type of Impact *(Nature) =* ***+1*** *(Positive Impact) or* ***-1*** *(Negative Impact)*

Table 8-1 presents a summary of the impact significance without and the with mitigation measures. The detailed impact matrix is provided in Appendix B.

Table 8-1: Impact Assessment Parameter Ratings

Rating	Intensity / Replacability		Extent	Duration / Reversibility	Probability
	Negative Impacts	Positive Impacts			
7	Irreplaceable loss or damage to biological or physical resources or highly sensitive environments. Irreplaceable damage to highly sensitive cultural/social resources.	Noticeable, on-going natural and / or social benefits which have improved the overall conditions of the baseline.	International The effect will occur across international borders.	Permanent: The impact is irreversible, even with management, and will remain after the life of the project.	Definite: There are sound scientific reasons to expect that the impact will definitely occur. >80% probability.
6	Irreplaceable loss or damage to biological or physical resources or moderate to highly sensitive environments. Irreplaceable damage to cultural/social resources of moderate to highly sensitivity.	Great improvement to the overall conditions of a large percentage of the baseline.	National Will affect the entire country.	Beyond project life: The impact will remain for some time after the life of the project and is potentially irreversible even with management.	Almost certain / Highly probable: It is most likely that the impact will occur. <80% probability.

Rating	Intensity / Replacability		Extent	Duration / Reversibility	Probability
	Negative Impacts	Positive Impacts			
5	Serious loss and/or damage to physical or biological resources or highly sensitive environments, limiting ecosystem function. Very serious widespread social impacts. Irreparable damage to highly valued items.	On-going and widespread benefits to local communities and natural features of the landscape.	Province/ Region Will affect the entire province or region.	Project Life (>15 years): The impact will cease after the operational life span of the project and can be reversed with sufficient management.	Likely: The impact may occur. <65% probability.
4	Serious loss and/or damage to physical or biological resources or moderately sensitive environments, limiting ecosystem function. On-going serious social issues. Significant damage to structures / items of cultural significance.	Average to intense natural and / or social benefits to some elements of the baseline.	Municipal Area Will affect the whole municipal area.	Long term: 6-15 years and impact can be reversed with management.	Probable: Has occurred here or elsewhere and could therefore occur. <50% probability.

Rating	Intensity / Replacability		Extent	Duration / Reversibility	Probability
	Negative Impacts	Positive Impacts			
3	Moderate loss and/or damage to biological or physical resources of low to moderately sensitive environments and, limiting ecosystem function. On-going social issues. Damage to items of cultural significance.	Average, on-going positive benefits, not widespread but felt by some elements of the baseline.	Local Local extending only as far as the development site area and its immediate surrounds.	Medium term: 1-5 years and impact can be reversed with minimal management.	Unlikely: Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur. <25% probability.
2	Minor loss and/or effects to biological or physical resources or low sensitive environments, not affecting ecosystem functioning. Minor medium-term social impacts on local population. Mostly repairable. Cultural functions and processes not affected.	Low positive impacts experience by a small percentage of the baseline.	Limited Limited to the development site only.	Short term: Less than 1 year and is reversible.	Rare / improbable: Conceivable, but only in extreme circumstances. The possibility of the impact materialising is very low as a result of design, historic experience or implementation of adequate mitigation measures. <10% probability.

Rating	Intensity / Replacability		Extent	Duration / Reversibility	Probability
	Negative Impacts	Positive Impacts			
1	Minimal to no loss and/or effect to biological or physical resources, not affecting ecosystem functioning. Minimal social impacts, low-level repairable damage to commonplace structures.	Some low-level natural and / or social benefits felt by a very small percentage of the baseline.	Very limited/Isolated Limited to specific isolated parts of the site.	Immediate: Less than 1 month and is completely reversible without management.	Highly unlikely / None: Expected never to happen. <1% probability.

Table 8-2: Probability / Consequence Matrix

		Significance																																					
Probability	7	-147	-140	-133	-126	-119	-112	-105	-98	-91	-84	-77	-70	-63	-56	-49	-42	-35	-28	-21	21	28	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140	147
	6	-126	-120	-114	-108	-102	-96	-90	-84	-78	-72	-66	-60	-54	-48	-42	-36	-30	-24	-18	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126
	5	-105	-100	-95	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105
	4	-84	-80	-76	-72	-68	-64	-60	-56	-52	-48	-44	-40	-36	-32	-28	-24	-20	-16	-12	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84
	3	-63	-60	-57	-54	-51	-48	-45	-42	-39	-36	-33	-30	-27	-24	-21	-18	-15	-12	-9	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63
	2	-42	-40	-38	-36	-34	-32	-30	-28	-26	-24	-22	-20	-18	-16	-14	-12	-10	-8	-6	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42
	1	-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
		-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
		Consequence																																					

No	Activity	Aspect	Impact / Risks	Phase	Impact Significance (without mitigation)		Mitigation Required	Impact Significance (with mitigation)	
1	Site clearance and vegetation removal Establishment of access roads / tracks Stockpiling of topsoil	Soil and Land Capability	Soil compaction due to movement of machinery; and Soil erosion and ultimate loss of topsoil resources and land capability due to site clearance and stockpiling of topsoil.	Site establishment	-42	Minor Negative	Only clear vegetation and remove topsoil when and where necessary; and Ensure topsoil is stockpiled along the mined out strip and is less than 3 m high.	-25	Negligible negative
2	Site clearance and vegetation removal Establishment of access roads / tracks Stockpiling of topsoil	Flora and Fauna	Direct loss of vegetation due to site clearing and the subsequent loss of faunal habitats.	Site establishment	-77	Moderate Negative	Reduce the project footprint by clearing only the strips and associated access road / track to be mined out; and Plant SSC, such as Boophone disticha, must be removed as per provincial authorisation and transplanted as per regulations.	-44	Minor Negative

No	Activity	Aspect	Impact / Risks	Phase	Impact Significance (without mitigation)		Mitigation Required	Impact Significance (with mitigation)	
3	Site clearance and vegetation removal Establishment of access roads / tracks Stockpiling of topsoil	Wetlands	Activities will expose soils and increase the risk of erosion and windblown dust. This may result in siltation of the wetland	Site establishment	-40	Minor Negative	Ensure site clearing is limited to the designated areas; Berms must be constructed around the periphery of the mining site to separate clean and dirty water. Water within the mining site must be diverted to the water sump; The use of dust suppression measures such as watering must be implemented to avoid windblown dust	-15	Negligible negative
4	Site clearance and vegetation removal Establishment of access roads / tracks Stockpiling of topsoil	Air Quality	Increased dust during the stripping and removal of vegetation and loading and offloading of sand material.	Site establishment and Operational Phases	-60	Minor Negative	Only clear vegetation and remove topsoil when and where necessary; Ensure topsoil is stockpiled along the mined out strip and is less than 3 m high. Use of dust suppression measures such as watering must be implemented on the access roads; and Drop heights must be minimised during sand loading.	-24	Negligible negative

No	Activity	Aspect	Impact / Risks	Phase	Impact Significance (without mitigation)		Mitigation Required	Impact Significance (with mitigation)	
5	Site clearance and vegetation removal Establishment of access roads / tracks Stockpiling of topsoil	Noise	Increased noise from Mining machinery and vehicles	Site establishment and Operational Phases	-8	Negligible negative	Mining related machines and vehicles are to be serviced on a regular basis to ensure noise suppression mechanisms are effective e.g. installed exhaust mufflers; and Switching off equipment when not in use.	-4	Negligible negative
6	Mining of sand resources Transportation of sand	Soil and Land Capability	Loss of topsoil resources through wind erosion; and Soil compaction from moving vehicles	Operational Phase	-54	Minor Negative	Dust suppression of topsoil stockpiles must be suppressed with water during windy conditions (Sep – Nov); Ensure topsoil is stockpiled along the mined out strip and is less than 3 m high	-28	Negligible negative

No	Activity	Aspect	Impact / Risks	Phase	Impact Significance (without mitigation)		Mitigation Required	Impact Significance (with mitigation)	
7	Mining of sand resources Transportation of sand	Air Quality	Increased dust during the mining and transport of sand	Operational Phase	-78	Moderate Negative	Use of dust suppression measures must be implemented on the access roads and topsoil stockpiles; Ensure topsoil is stockpiled along the mined out strip and is less than 3 m high. Use of tarpaulins on all trucks transporting the sand material; and Drop heights must be minimised during loading of sand.	-36	Minor Negative
8	Mining of sand resources Transportation of sand	Wetlands	Soil erosion resulting in sedimentation of downstream wetlands	Operational Phase	-40	Minor Negative	Only clear vegetation when and where necessary; The use of dust suppression measures such as watering must be implemented to avoid windblown dust (Sep – Nov); Berms on the periphery of the mining site should be inspected daily and maintained to ensure runoff from within the mining site does not report to the wetland; and	-15	Negligible negative

No	Activity	Aspect	Impact / Risks	Phase	Impact Significance (without mitigation)		Mitigation Required	Impact Significance (with mitigation)	
9	Mining of sand resources Transportation of sand	Noise	Mining machinery and vehicles may be a social nuisance due to increased ambient noise levels at surrounding noise sensitive receptors	Operational Phase	-14	Negligible negative	Mining related machines and vehicles to be serviced on a regular basis to ensure noise suppression mechanisms are effective e.g. installed exhaust mufflers; and Switching off equipment when not in use	-7	Negligible negative
10	Mining of sand resources Transportation of sand	Social Impacts	Generation of income due to continued employment	Operational Phase	49	Minor Positive	Provide local employees with reference letters that they can submit to gain further employment. Also, provide certificates of completion for in-house (on-the-job) training provided	77	Moderate Positive
11	Backfilling of the mined excavations with topsoil Rehabilitation (topsoil cover, ripping and vegetation establishment)	Flora and Fauna	Establishment of Alien invasive species on site	Closure and Rehabilitation	-77	Moderate Negative	Undertake an alien invasive monitoring programme. This must be done prior to the Establishment phase to ensure no spreading occurs during Establishment, Operational or Closure and Rehabilitation Phase.	-50	Minor Negative

No	Activity	Aspect	Impact / Risks	Phase	Impact Significance (without mitigation)		Mitigation Required	Impact Significance (with mitigation)	
12	Backfilling of the mined excavations with topsoil Rehabilitation (topsoil cover, ripping and vegetation establishment)	Noise	Mining machinery and vehicles may increase ambient noise levels at surrounding noise sensitive receptors	Closure and Rehabilitation	-8	Negligible negative	Mining related machines and vehicles to be serviced on a regular basis to ensure noise suppression mechanisms are effective e.g. installed exhaust mufflers; and Switching off equipment when not in use.	-4	Negligible negative

9 Advantages and Disadvantages of the Proposed Change

Positive impacts of the proposed Project can be summarised as follows:

- **Employment** – Copper Sunset is reaching the end of its Life of Mine (LoM) (approximately 4 months remaining). The mining extension is expected to extend the LoM by a further 9 months. Thus, the current Copper Sunset employees will remain employed for an extended period. Employment as well as the additional infrastructure (access road) will contribute to the overall socio-economic profile of the local area; and
- **Continued Tax Base and Revenue** – The continued mining of sand would result in continued revenue for Copper Sunset and associated tax contributions towards the country. The market share of the existing operation is about 46% and this is not expected to change as the Mining Right extension comes into operation as this will coincide with the partial depletion of the existing mine.

Negative impacts of the proposed Project can be summarised as follows:

- **Dust Generation** – During the establishment and operation phase it is expected to have a negative impact on air quality. Site clearing and construction activities may result in fugitive dust emissions. This is expected to be a social nuisance to nearby receptors, mainly the community Viljoendrif north of the project in the predominant wind direction;
- **Noise Generation** – machinery and vehicles will be used in the establishment, operation and rehabilitation phase which will result in an increase in the ambient noise levels, although they are not expected to exceed the Noise Control Regulations limit. This is expected to be a social nuisance to nearby receptors, mainly the Anglo New Vaal Colliery Community Centre, however the noise levels are anticipated to remain within legal limits;
- **Loss of Fauna and Flora Habitat –** the mining extension will result in further site clearance, thus result in the further loss of fauna and flora habitat; and
- **Siltation of wetland –** During the establishment and operational phase exposed soils may result in soil erosion and windblown dust which result in increased siltation of the wetland adjacent to the application area. The presence of the road greatly reduces the likelihood of this impact. The wetland on site will also likely be impacted upon. Specialist assessment of this wetland identified that it is artificial and not ecologically sensitive.

10 Measures to Ensure Avoidance, Management and Mitigation of Impacts Associated with the Proposed Change

Management and mitigation measures are presented in Table 8-1 above.

The approved EMPr is included as Appendix C.

11 Impacts to be mitigated in their respective Phases

Impacts identified in Table 8-1 above are categorised according to the phase in which the impact is anticipated. Table 8-1 also contains mitigation measures for each impact.

12 Details of the public participation process followed

The Public Participation Process (PPP) is undertaken in compliance with the EIA Regulations, 2014 (as amended) promulgated on 8 December 2014, in terms of Sections 24(5) and 44 of the NEMA (GN R982 of 4 December 2014).

The following activities have been and will be undertaken to facilitate the PPP (please refer to Appendix D for details and proof):

Table 12-1: Public Participation Scope and Methodology

Scope of Work	Methodology
Notify I&APs of the Project	■ All stakeholders were provided with a Background Information Document (BIL), Announcement Letter and a Registration and Comment Form; ■ An advertisement was placed in one local newspaper, notifying stakeholders of the proposed project as well as inviting comments; ■ Site notices (four in total) were placed at prominent places at the Project areas and at accessible public places.
Provide I&APs with an opportunity to comment on the Project and Draft Reports	■ This Draft Amendment Report is placed on the Digby Wells website and at one public venue for a prescribed 30 day comment period; ■ Stakeholders were informed of availability of the Draft Report by means of a letter.
Undertake meaningful consultation with stakeholders	■ Telephonic landowner and land occupier consultation will take place. Telephonic consultation with relevant authorities will also be undertaken; ■ The need for stakeholders meetings will be determined based on feedback received from the public. If any stakeholder requests a meeting, such a meeting will be scheduled.

Record I&AP Comments and provide responses to issues and concerns communicated by I&APs	■ A Comment and Response Report (CRR) will be compiled which will include all the comments that have been made by I&APs throughout the PPP, together with responses from the Project team; ■ The CRR will be included in the Final Amendment Report.
Inform I&APs of the Authorities' decision	Once a decision has been issued in respect to the application, a notification letter announcing the outcome of the decision and the appeal process will be compiled and distributed to all parties registered on the database.

Digby Wells attended a pre-application consultative meeting with the DMR in Welkom on 04 October 2017. The process described above is in accordance with the guidance provided by the DMR at the pre-application consultative meeting. Please see Appendix F.

13 Undertaking

The EAP herewith confirms:-

- the correctness of the information provided in the reports
- the inclusion of comments and inputs from stakeholders and I&APs ;
- the inclusion of inputs and recommendations from the specialist reports where relevant; and
- the acceptability of the project in relation to the findings of the assessment and level of mitigation proposed.

14 References

Golder Associates. (2012). *Groundwater Impact Assessment Report for the New Vaal Clliery Life Extension Project.* Golder Associates.

Jackson, W. (2014). *Soils, Land Capability, and Land Use Environmental Impact Assessment for Copper Sunset Sand Mine.* Randburg: Digby Wells Environmental.

Kruger, A. (2004). *Climate of South Africa. Climate Regions WS45.* Pretoria: South African Weater Service.

Mucina, L., & Rutherford, M. (2006). *The vegetation of south Africa, Lesotho and Swaziland.* Pretoria: South African National Biodiversity Institute.

Appendix A: Maps and Plans

Plan 1: Regional Locality

Plan 2: Local Setting

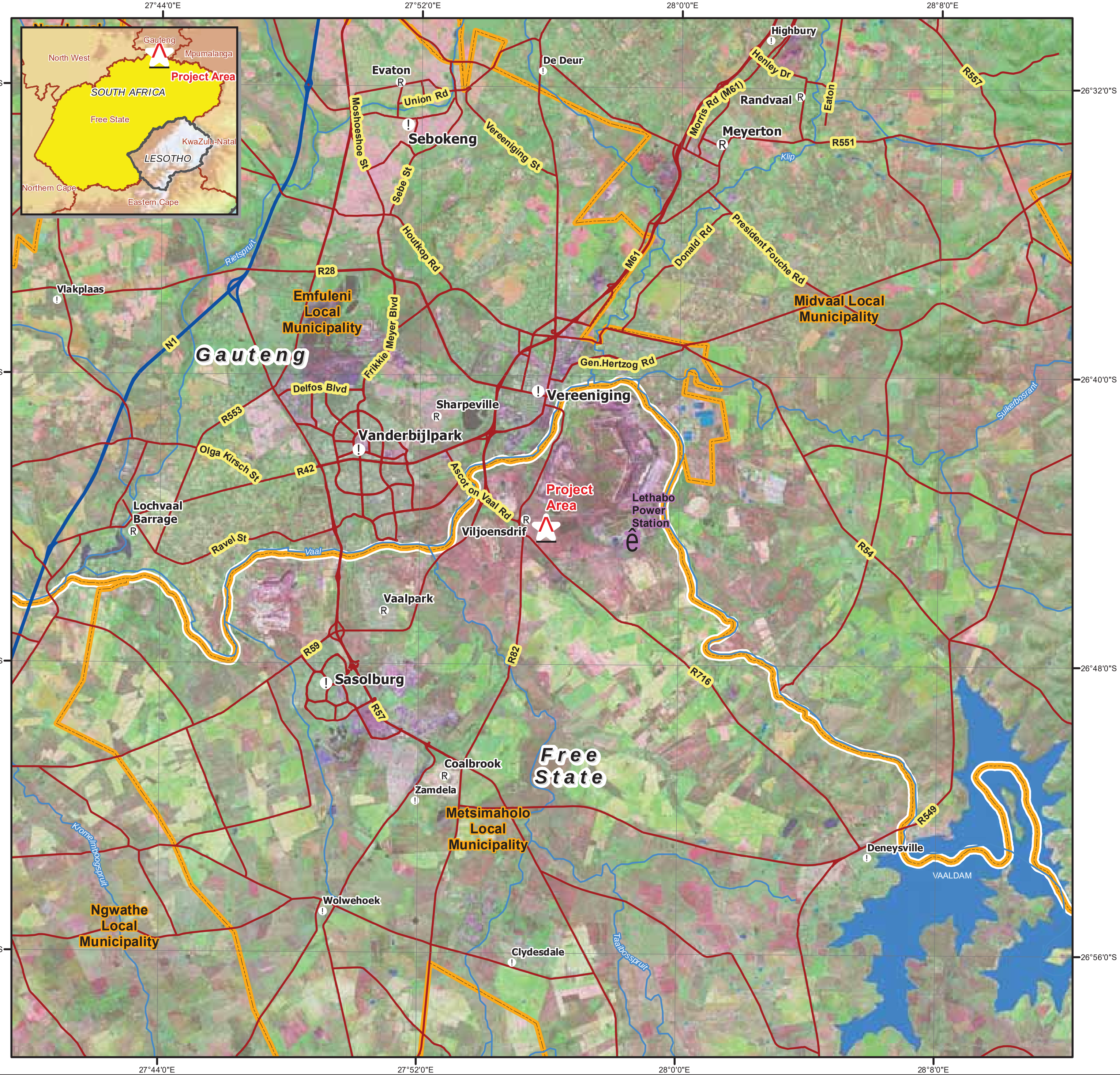
Plan 3: Approved and Proposed Mining Areas

Plan 4: Geology

Plan 5: Vegetation

Plan 6: Vulnerable Ecosystems

Plan 7: Wetlands



Plan 1

Copper Sunset Sand

Regional Setting

Legend

- Project Area
- Lethabo Power Station
- Major Town
- Secondary Town
- Other Town
- Settlement
- Main Road
- National Road
- River
- Dam
- Local Municipality Boundary
- Provincial Boundary

DIGBY WELLS ENVIRONMENTAL

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Projection: Transverse Mercator
Datum: WGS 1984
Central Meridian: 27°E

Ref #: kam.COP4899.201710.001
Revision Number: 1
Date: 02/10/2017

0 2.5 5 10
Kilometres
1:200 000

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Plan 2

Copper Sunset Sand

Local Setting

Legend

- Extended Mining Area (Proposed)
- Original Mining Right Area (Approved)
- Application Area 1 (Approved)
- Application Area 2 (Approved)
- ! Major Town
- R Other Town
- Arterial / National Route
- Main Road
- Minor Road
- Railway Line
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake
- Non-Perennial Pan
- Perennial Pan
- Wetland

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Central Meridian: 27°E	Date: 02/10/2017

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Kilometres
1:80 000

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Plan 3

Copper Sunset Sand

Approved & Proposed Mining Areas

Legend

- Extended Mining Area (Proposed)
- Original Mining Right Area (Approved)
- Application Area 1 (Approved)
- Application Area 2 (Approved)
- R Other Town
- Arterial / National Route
- Main Road
- Minor Road
- Railway Line
- Non-Perennial Stream
- Dam Wall
- Dam / Lake
- Wetland

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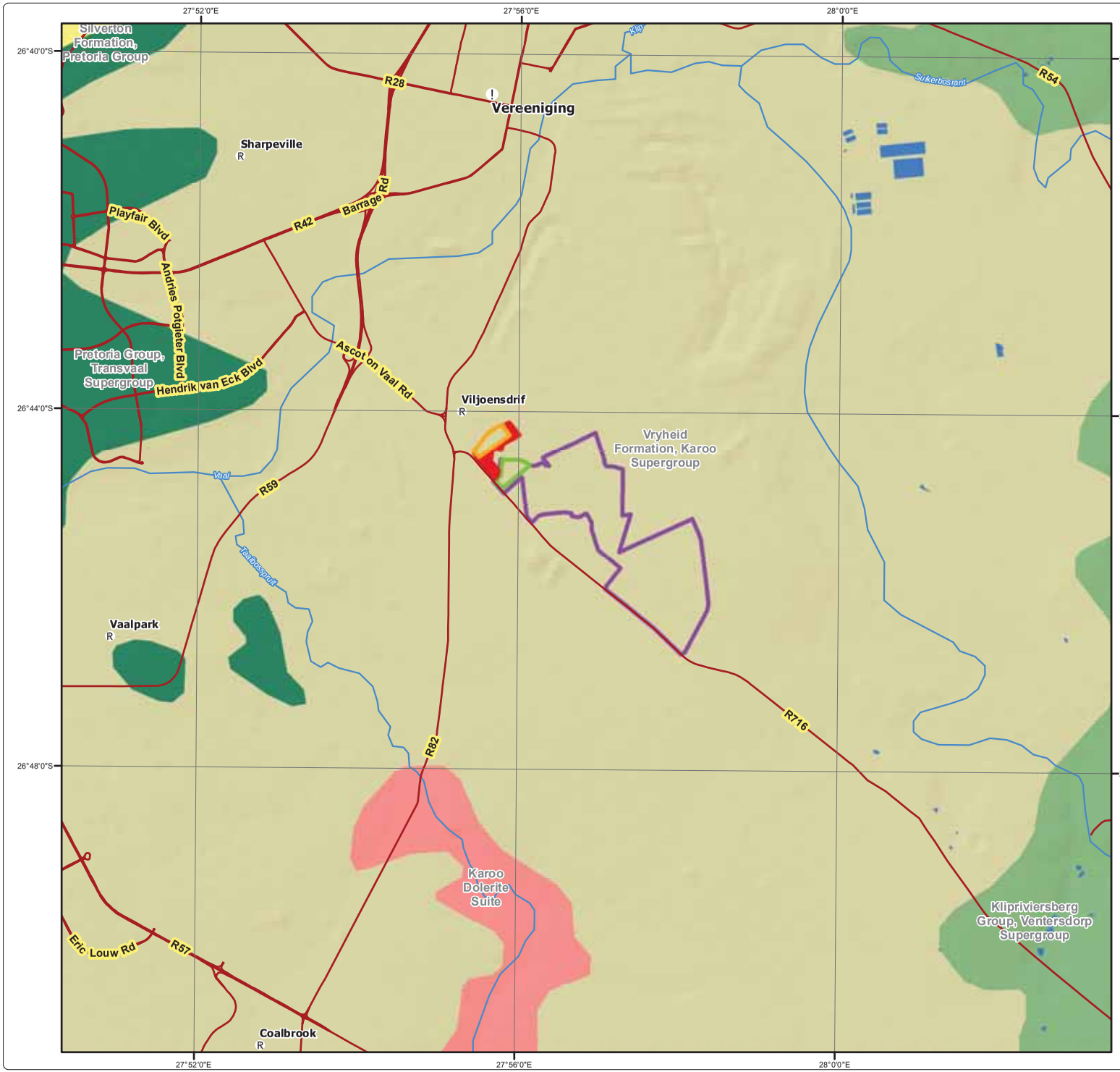

Plan 4

Copper Sunset Sand

Geology

Legend

- Extended Mining Area (Proposed)
- Original Mining Right Area (Approved)
- Application Area 1 (Approved)
- Application Area 2 (Approved)
- ! Major Town
- R Other Town
- Main Road
- River
- Dam

Geology

- Fault Observed
- Karoo Dolerite Suite
- Klipriviersberg Group, Ventersdorp Supergroup
- Pretoria Group, Transvaal Supergroup
- Silverton Formation, Pretoria Group
- Vryheid Formation, Karoo Supergroup

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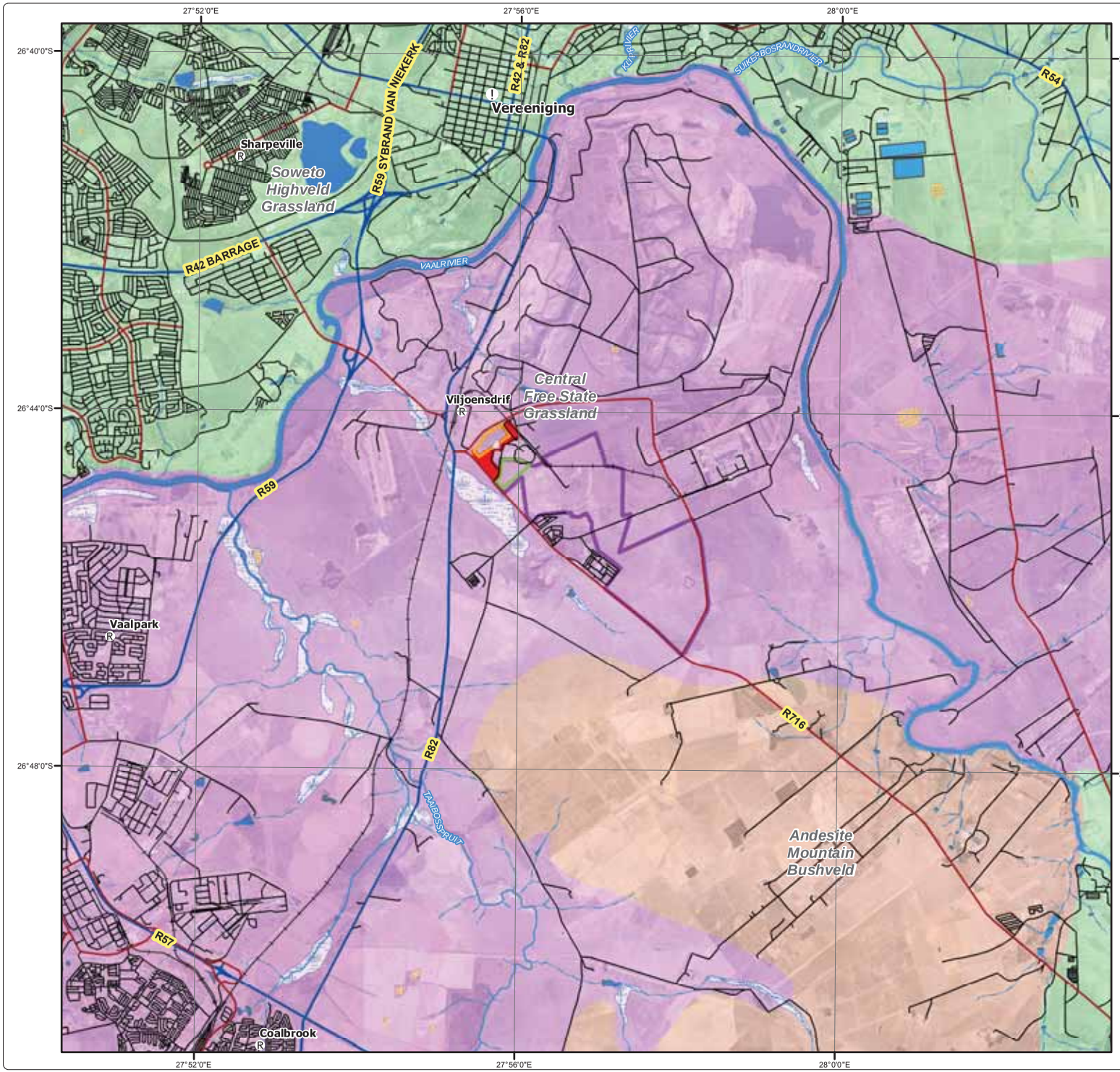

Plan 5

Copper Sunset Sand

Vegetation Types

Legend

- Extended Mining Area (Proposed)
- Original Mining Right Area (Approved)
- Application Area 1 (Approved)
- Application Area 2 (Approved)
- Major Town
- Other Town
- Arterial / National Route
- Main Road
- Minor Road
- Railway Line
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake
- Non-Perennial Pan
- Perennial Pan
- Wetland

Vegetation Types (Mucina & Rutherford, 2012)

- Andesite Mountain Bushveld
- Central Free State Grassland
- Soweto Highveld Grassland

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Central Meridian: 27°E	Date: 02/10/2017

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Kilometres
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Plan 6

Copper Sunset Sand

Vulnerable Ecosystems

Legend

- Extended Mining Area (Proposed)
- Original Mining Right Area (Approved)
- Application Area 1 (Approved)
- Application Area 2 (Approved)
- ! Major Town
- R Other Town
- Arterial / National Route
- Main Road
- Minor Road
- Railway Line
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake
- Non-Perennial Pan
- Perennial Pan
- Wetland

Threatened Ecosystems

- Soweto Highveld Grassland

Vulnerable Area According to Mucina & Rutherford (2012)

- Central Free State Grassland

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Central Meridian: 27°E	Date: 02/10/2017

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Kilometres

1:80 000

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Plan 7

Copper Sunset Sand

Wetlands

Legend

- Extended Mining Area (Proposed)
- Original Mining Right Area (Approved)
- Application Area 1 (Approved)
- Application Area 2 (Approved)
- R — Other Town
- Arterial/National Route
- Main Road
- Minor Road
- Railway Line
- Non-Perennial Stream

Wetland Delineation

- Wetland Delineation
- 100m Buffer of Wetland Delineation
- 500m Buffer of Wetland Delineation

NFEPA Wetlands

- Valley floor, Channelled valley-bottom wetland, Rank 4
- Valley floor, Channelled valley-bottom wetland, Rank 5
- Valley floor, Channelled valley-bottom wetland, Rank 6
- 100m Buffer of NFEPA Wetlands
- 500m Buffer of NFEPA Wetlands

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Projection: Transverse Mercator	Ref #: kam.COP4899.201710.007
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Metres

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Appendix B: Detailed Impact Assessment

DIGBY WELLS ENVIRONMENTAL

No	Activity	Aspect	Impact / Risks	Phase	Probability		Duration		Scale / Extent		Magnitude		Nature of Impact	Impact Significance (without mitigation)		Mitigation Required	Probability		Duration		Scale / Extent		Magnitude		Nature of Impact	Impact Significance (with mitigation)	
1	Site clearance and vegetation removal Establishment of access roads / tracks Stockpiling of topsoil	Soil and Land Capability	Soil compaction due to movement of machinery; and Soil erosion and ultimate loss of topsoil resources and land capability due to site clearance and stockpiling of topsoil.	Site establishment	6	Almost Certain	2	Short Term	2	Site	3	Low-Moderate	-1	Negative	-42	Minor Negative	Only clear vegetation and remove topsoil when and where necessary; and Ensure topsoil is stockpiled along the mined out strip and is less than 3 m high.	5	Likely	2	Short Term	1	Isolated	2	Minor	-1	Negative	-25	Negligible negative
2	Site clearance and vegetation removal Establishment of access roads / tracks Stockpiling of topsoil	Flora and Fauna	Direct loss of vegetation due to site clearing and the subsequent loss of faunal habitats.	Site establishment	7	Definite	5	Project Life	3	Site and Surrounds	3	Low-Moderate	-1	Negative	-77	Moderate Negative	Reduce the project footprint by clearing only the strips and associated access road / track to be mined out; and Plant SSC, such as Boophone disticha, must be removed as per provincial authorisation and transplanted as per regulations.	4	Probable	5	Project Life	3	Site and Surrounds	3	Low-Moderate	-1	Negative	-44	Minor Negative
3	Site clearance and vegetation removal Establishment of access roads / tracks Stockpiling of topsoil	Wetlands	Activities will expose soils and increase the risk of erosion and windblown dust. This may result in siltation of the wetland	Site establishment	5	Likely	2	Short Term	3	Site and Surrounds	3	Low-Moderate	-1	Negative	-40	Minor Negative	Ensure site clearing is limited to the designated areas; Berms must be constructed around the periphery of the mining site to separate clean and dirty water. Water within the mining site must be diverted to the water sump; The use of dust suppression measures such as watering must be implemented to avoid windblown dust	3	Unlikely	2	Short Term	1	Isolated	2	Minor	-1	Negative	-15	Negligible negative
4	Site clearance and vegetation removal Establishment of access roads / tracks Stockpiling of topsoil	Air Quality	Increased dust during the stripping and removal of vegetation and loading and offloading of sand material.	Site establishment and Operational Phases	6	Almost Certain	2	Short Term	4	Municipal	4	Moderate	-1	Negative	-60	Minor Negative	Only clear vegetation and remove topsoil when and where necessary; Ensure topsoil is stockpiled along the mined out strip and is less than 3 m high. Use of dust suppression measures such as watering must be implemented on the access roads; and Drop heights must be minimised during sand loading.	4	Probable	2	Short Term	2	Site	2	Minor	-1	Negative	-24	Negligible negative
5	Site clearance and vegetation removal Establishment of access roads / tracks Stockpiling of topsoil	Noise	Increased noise from Mining machinery and vehicles	Site establishment and Operational Phases	2	Rare/Improbable	2	Short Term	1	Isolated	1	Minimal	-1	Negative	-8	Negligible negative	Mining related machines and vehicles are to be serviced on a regular basis to ensure noise suppression mechanisms are effective e.g. installed exhaust mufflers; and Switching off equipment when not in use.	1	Highly Unlikely	2	Short Term	1	Isolated	1	Minimal	-1	Negative	-4	Negligible negative
6	Mining of sand resources Transportation of sand	Soil and Land Capability	Loss of topsoil resources through wind erosion; and Soil compaction from moving vehicles	Operational Phase	6	Almost Certain	3	Medium Term	3	Site and Surrounds	3	Low-Moderate	-1	Negative	-54	Minor Negative	Dust suppression of topsoil stockpiles must be suppressed with water during windy conditions (Sep – Nov); Ensure topsoil is stockpiled along the mined out strip and is less than 3 m high	4	Probable	2	Short Term	2	Site	3	Low-Moderate	-1	Negative	-28	Negligible negative
7	Mining of sand resources Transportation of sand	Air Quality	Increased dust during the mining and transport of sand	Operational Phase	6	Almost Certain	5	Project Life	4	Municipal	4	Moderate	-1	Negative	-78	Moderate Negative	Use of dust suppression measures must be implemented on the access roads and topsoil stockpiles; Ensure topsoil is stockpiled along the mined out strip and is less than 3 m high. Use of tarpaulins on all trucks transporting the sand material; and Drop heights must be minimised during loading of sand.	4	Probable	5	Project Life	2	Site	2	Minor	-1	Negative	-36	Minor Negative
8	Mining of sand resources Transportation of sand	Wetlands	Soil erosion resulting in sedimentation of downstream wetlands	Operational Phase	5	Likely	2	Short Term	3	Site and Surrounds	3	Low-Moderate	-1	Negative	-40	Minor Negative	Only clear vegetation when and where necessary; The use of dust suppression measures such as watering must be implemented to avoid windblown dust (Sep – Nov); Berms on the periphery of the mining site should be inspected daily and maintained to ensure runoff from within the mining site does not report to the wetland; and	3	Unlikely	2	Short Term	2	Site	1	Minimal	-1	Negative	-15	Negligible negative
9	Mining of sand resources Transportation of sand	Noise	Mining machinery and vehicles may be a social nuisance due to increased ambient noise levels at surrounding noise sensitive receptors	Operational Phase	2	Rare/Improbable	5	Project Life	1	Isolated	1	Minimal	-1	Negative	-14	Negligible negative	Mining related machines and vehicles to be serviced on a regular basis to ensure noise suppression mechanisms are effective e.g. installed exhaust mufflers; and Switching off equipment when not in use	1	Highly Unlikely	5	Project Life	1	Isolated	1	Minimal	-1	Negative	-7	Negligible negative
10	Mining of sand resources Transportation of sand	Social Impacts	Generation of income due to continued employment	Operational Phase	7	Definite	2	Short Term	2	Site	3	Low-Moderate	1	Positive	49	Minor Positive	Provide local employees with reference letters that they can submit to gain further employment. Also, provide certificates of completion for in-house (on-the-job) training provided	7	Definite	5	Project Life	2	Site	4	Moderate	1	Positive	77	Moderate Positive
11	Backfilling of the mined excavations with topsoil Rehabilitation (topsoil cover, ripping and vegetation establishment)	Flora and Fauna	Establishment of Alien invasive species on site	Closure and Rehabilitation	7	Definite	4	Long Term	3	Site and Surrounds	4	Moderate	-1	Negative	-77	Moderate Negative	Undertake an alien invasive monitoring programme. This must be done prior to the Establishment phase to ensure no spreading occurs during Establishment, Operational or Closure and Rehabilitation Phase.	5	Likely	4	Long Term	3	Site and Surrounds	3	Low-Moderate	-1	Negative	-50	Minor Negative
12	Backfilling of the mined excavations with topsoil Rehabilitation (topsoil cover, ripping and vegetation establishment)	Noise	Mining machinery and vehicles may increase ambient noise levels at surrounding noise sensitive receptors	Closure and Rehabilitation	2	Rare/Improbable	2	Short Term	1	Isolated	1	Minimal	-1	Negative	-8	Negligible negative	Mining related machines and vehicles to be serviced on a regular basis to ensure noise suppression mechanisms are effective e.g. installed exhaust mufflers; and Switching off equipment when not in use.	1	Highly Unlikely	2	Short Term	1	Isolated	1	Minimal	-1	Negative	-4	Negligible negative

Appendix C: Approved EMPr

Part B: Environmental Management Programme Report

1 Details of the EAP

The details of the EAP have been provided in Section 2.1, Part A of this report.

2 Description of the aspects of the activity

Refer to Section 5 of Part A.

3 Composite Map

The composite plan for the project area, indicating sensitive areas, heritage resources, watercourse buffers is included in Plan 10, Appendix A.

4 Description of Impact Management Objectives including Management Statements

4.1 Determination of closure objectives

The closure objectives have been formulated for the project and are as follows:

- Rehabilitate the mining sites to its natural or predetermined state, or to land use that conforms to the generally accepted principles of sustainable development through restoration, remediation, rehabilitation and stabilisation;
- Rehabilitate all disturbed land to a condition that facilitates compliance with applicable environmental quality objectives, such as air and water quality objectives as an example;
- Reduce the visual impact of the mining site through rehabilitation of all disturbed land and residue deposits;
- Keep authorities informed of the progress of the activities during the Closure Phase;
- Submit monitoring results to the relevant authorities; and
- Maintain the required pollution control facilities and the condition of the rehabilitated land following closure.

4.2 Volumes and Rate of Water Use required for the Operation

Water will be supplied via the borehole, located on the current mining operation area. This borehole is authorised under a current WUL granted to Copper Sunset. It is anticipated that water will only be required for dust suppression on the expansion area. It is unknown at this stage as to the volume of water of water required for dust suppression.

4.3 Has a Water Use Licence has been applied for

A Water Use Licence was approved for Copper Sunset's current Mining Right with reference number FS 30/5/1/2/2/164 MR.

A new WULA will be compiled for this proposed expansion area.

4.4 Impacts to be mitigated in their Respective Phases

The proposed mitigation measures and its compliance with the relevant standards are presented in Table 4-1.

Table 4-1: Impacts to be mitigated

Activities	Aspects Affected	Phase	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
Establishment Phase						
Site clearance and vegetation removal Establishment of access	Soils	Establishment Phase	19 ha	▪ Only clear vegetation when and where necessary; ▪ Only remove topsoil when and where necessary; and ▪ Ensure topsoil is stockpiled, less than 3 m high.	▪ Soil Rehabilitation Plan; and ▪ Storm Water Management Plan in accordance with: ▪ MPRDA Regulation 56 (1) to (8); soil pollution and erosion control; and ▪ CARA.	▪ Ongoing and Weekly during: Establishment Phase

Activities	Aspects Affected	Phase	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
roads Stockpiling of topsoil	Fauna and Flora	Establishment Phase	19 ha	▪ All soils should be stored and managed correctly for rehabilitation ▪ Only remove vegetation when and where necessary; ▪ Minimise the size of the mined area as far as possible; ▪ Plant SSC, such as *Boophone disticha*, must be removed as per provincial authorisation and transplanted as per regulations; ▪ Drainage lines, and indigenous vegetation will be avoided; and ▪ Use existing access roads.	▪ NEM:BA; and ▪ ECA.	▪ Ongoing during: Establishment Phase

Activities	Aspects Affected	Phase	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
	Wetlands	Establishment Phase	Local	▪ Berms must be constructed around the periphery of the mining site to separate clean and dirty water. Water within the mining site must be diverted to the water sump; and ▪ It is recommended that all watercourses be avoided with a stipulated buffer zone (i.e. mining outside of the 1: 50 year floodline of any watercourse and/or outside the 100 m buffer of a watercourse, whichever is greater).	▪ Buffer zones; and ▪ Spill Response Plan in accordance with: ▪ NWA; ▪ Best Practice Guidelines; and ▪ MPRDA.	▪ As required and throughout the Establishment Phase

Activities	Aspects Affected	Phase	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
	Groundwater	Establishment Phase	Local	▪ All potential hydrocarbon spillages and leaks must be cleaned up immediately and the soils remediated; ▪ Spillage control kits will be readily available on site to contain the mobilisation of contaminants and clean up spills; ▪ All vehicles and machinery to be serviced in a hard park area or at an off-site location; and ▪ Vehicles with leaks must have drip trays in place.	▪ Spill Response Plan; and ▪ Vehicle Maintenance Plan in accordance with: ▪ NWA; ▪ Best Practice Guidelines	▪ As required

Activities	Aspects Affected	Phase	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
	Noise	Establishment Phase	Site Specific	▪ Site clearing to take place during daylight hours only; ▪ Vehicles and machinery will be properly maintained on a regular basis to minimise operating noise; ▪ Switching off equipment when not in use. ▪ Vehicles will obey speed limits (30km/h); and ▪ Bulk Delivery of materials should be maximised to reduce the frequency of deliveries.	▪ Regular Vehicle Inspections in accordance with: ▪ ECA.	▪ Daily and according to Maintenance Plan during the Establishment and Closure Phases

Activities	Aspects Affected	Phase	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
	Air Quality	Establishment Phase	Local	▪ Only remove topsoil when and where necessary; and ▪ Ensure topsoil is stockpiled, less than 3 m high.; ▪ Stockpiles or loaded material should be covered during windy/rainfall days and where practical; ▪ Use of dust suppression measures such as watering must be implemented on the access roads and topsoil stockpiles; and ▪ Drop heights must be minimised during sand loading.	▪ NEM:AQA	▪ As required and throughout the Establishment Phase
Operational Phase						

Activities	Aspects Affected	Phase	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
Mining of sand resources Transportation of sand	Continued Employment	Operational Phase	Local	▪ Provide local employees with reference letters that they can submit to gain further employment. Also, provide certificates of completion for in-house (on-the-job) training provided; and ▪ Promote labour -intensive construction methods.	▪ Social and Labour Plan	▪ During employment contract

Activities	Aspects Affected	Phase	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
	Soils	Operational Phase	Site Specific	▪ Immediately cease mining and contain and clean-up any hydrocarbon spillages as they occur; ▪ Stockpiles must be suppressed with water during windy conditions. ▪ Ensure the spill clean-up kits are readily available in the event of a spillage; and ▪ Machinery and vehicles must be serviced and maintained off site at a workshop and drip trays must be in place to capture the spillage and avoid soils from being contaminated.	▪ Spill Response Plan in accordance with: ▪ MPRDA Regulation 56 (1) to (8); soil pollution and erosion control; and ▪ CARA.	▪ As required and throughout the Operational Phase

Activities	Aspects Affected	Phase	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
	Surface water/Wetlands	Operational Phase	Local	▪ Only clear vegetation when and where necessary; ▪ Berms on the periphery of the mining site will be inspected daily and maintained to ensure runoff from within the mining site does not report to the catchment.	▪ Spill Response Plan in accordance with: ▪ MPRDA Regulation 56 (1) to (8); soil pollution and erosion control.	▪ As required and throughout the Operational Phase
	Groundwater	Operational Phase	Local	▪ Emergency spill response plan required to handle any unplanned spillages; and ▪ Daily inspection of the drill rig must be undertaken prior to the commencement of drilling and routine maintenance must be undertaken to prevent the likelihood of fluid dispersing and breakdowns; ▪	▪ Spill Response Plan; and ▪ Vehicle Maintenance Plan in accordance with: ▪ NWA; and ▪ Best Practice Guidelines	▪ As required.

Activities	Aspects Affected	Phase	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
	Noise	Operational Phase	Site Specific	▪ Mining related machines and vehicles to be serviced on a regular basis to ensure noise suppression mechanisms are effective e.g. installed exhaust mufflers; and ▪ Switching off equipment when not in use.	▪ Regular Vehicle Inspections in accordance with : ▪ ECA.	▪ Daily and according to Maintenance Plan during: Operational Phase
	Air Quality	Operational Phase	Local	▪ Use of dust suppression measures must be implemented on the access roads; ▪ Use of tarpaulins on all trucks transporting the sand material; and ▪ Drop heights must be minimised during loading of sand.	▪ NEM:AQA	▪ Daily and according to Maintenance Plan during: Operational Phase
Closure and Rehabilitation Phase						

Activities	Aspects Affected	Phase	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
Rehabilitation (topsoil cover, ripping and vegetation establishment)	Fauna and Flora	Closure and Rehabilitation Phase	19 ha	▪ Remove alien invasive species as and when they occur; ▪ An alien invasive management plan must be established; and ▪ All compacted areas will be ripped to loosen the soils during rehabilitation and seeded with an appropriate seed mixture.	▪ NEM:BA	▪ Ongoing during closure phase.
	Noise	Closure and Rehabilitation Phase	Site Specific	▪ Mining related machines and vehicles to be serviced on a regular basis to ensure noise suppression mechanisms are effective e.g. installed exhaust mufflers; and ▪ Switching off equipment when not in use.	▪ Regular Vehicle Inspections in accordance with : ▪ ECA.	▪ Ongoing during closure phase

5 Impact Management Outcomes

A description of objectives and outcomes of the Environment Management Plan is outlined in Table 5-1, taking into account the impact and mitigation type.

Table 5-1: Summary of Impact Management Outcomes

Project Activity	Potential Impact	Aspects Affected	Phase	Mitigation Type	Standards to be achieved
Establishment Phase					
Site clearance and vegetation removal Establishment of access roads Stockpiling of topsoil	Dust generation	Air Quality	Establishment Phase	Control through: ▪ Dust Management Plan. ▪ Vegetation Establishment.	▪ NEM:AQA
	Soil compaction and soil erosion	Soils	Establishment Phase	Control through: ▪ Soil stripping procedure.	▪ Soil Rehabilitation Plan; and ▪ Storm Water Management Plan in accordance with: ▪ MPRDA Regulation 56 (1) to (8); soil pollution and erosion control; and CARA.
	Loss of fauna and flora species	Fauna and Flora	Establishment Phase	Avoid through: ▪ Limitation of infrastructure footprint.	▪ NEM:BA; and ▪ ECA.
	Sedimentation of wetlands	Surface water/ Wetlands	Establishment Phase	Prevent through: ▪ Storm Water Management Plan. ▪ Avoid through: ▪ Implementation of buffer zones.	▪ Buffer zones; and ▪ Spill Response Plan in accordance with: ▪ NWA; ▪ Best Practice Guidelines; and ▪ MPRDA.

Project Activity	Potential Impact	Aspects Affected	Phase	Mitigation Type	Standards to be achieved
	Noise generation	Noise	Establishment Phase	Control through: ▪ Operating hours; ▪ Use of silencers; and ▪ Routine maintenance and services.	▪ ECA.
Operational Phase					
Mining of sand resources Transportation of sand	Soil erosion	Soils	Operational Phase	Avoid and control through: ▪ Vegetation establishment. ▪ Restrict access.	▪ Soil Rehabilitation Plan; and ▪ Storm Water Management Plan in accordance with: ▪ MPRDA Regulation 56 (1) to (8); soil pollution and erosion control; and CARA
	Sedimentation of surface water resources	Surface Water/Wetlands	Operational Phase	Avoid through: ▪ Implementation of buffer zones; and ▪ Erosion management through stormwater control.	▪ Buffer zones; and ▪ Spill Response Plan in accordance with: ▪ NWA; and ▪ Best Practice Guidelines;

Project Activity	Potential Impact	Aspects Affected	Phase	Mitigation Type	Standards to be achieved
	Noise Generation	Noise	Operational Phase	Control through: ▪ Operating hours; ▪ Use of silencers; and ▪ Routine maintenance and services.	▪ ECA.
	Dust Generation	Air Quality	Operational Phase	Control through: ▪ Dust Management Plan; ▪ Only remove necessary vegetation	▪ NEM:AQA
	Continued Employment	Social	Operational Phase	Manage through supporting workers	▪ SLP
Rehabilitation Phase					
Rehabilitation (topsoil cover, ripping and vegetation establishment)	Establishment of Alien Invasive Species	Flora	Rehabilitation Phase	Control through: ▪ Dust Management Plan. ▪ Vegetation establishment.	▪ NEM:BA

Project Activity	Potential Impact	Aspects Affected	Phase	Mitigation Type	Standards to be achieved
	Noise Generation	Noise	Rehabilitation Phase	Control through: ▪ Operating hours; ▪ Use of silencers; and ▪ Routine maintenance and services.	▪ ECA.

6 Impact Management Actions

Table 6-1 provides a summary and description of the impact management actions.

Table 6-1: Summary of Impact Management Actions

Project Activity	Potential Impact	Mitigation Type	Time period for implementation	Standards to be achieved
Establishment Phase				
Site clearance and vegetation removal Establishment of access roads Stockpiling of topsoil	Dust generation	Control through: ▪ Dust Management Plan. ▪ Vegetation Establishment.	▪ As required and throughout the Establishment Phase	▪ NEM:AQA
	Soil compaction and soil erosion	Control through: ▪ Soil stripping procedure.	▪ Ongoing and Weekly during: Establishment Phase	▪ Soil Rehabilitation Plan; and ▪ Storm Water Management Plan in accordance with: ▪ MPRDA Regulation 56 (1) to (8); soil pollution and erosion control; and CARA.
	Loss of fauna and flora species	Avoid through: ▪ Limitation of infrastructure footprint.	▪ Ongoing during: Establishment Phase	▪ NEM:BA

Project Activity	Potential Impact	Mitigation Type	Time period for implementation	Standards to be achieved
	Sedimentation of wetlands	Prevent through: ▪ Storm Water Management Plan. ▪ Avoid through: ▪ Implementation of buffer zones.	▪ As required and throughout the Establishment Phase	▪ Buffer zones; ▪ Spill Response Plan in accordance with: ▪ NWA; ▪ Best Practice Guidelines; and ▪ MPRDA.
	Noise generation	Control through: ▪ Operating hours; ▪ Use of silencers; and ▪ Routine maintenance and services.	▪ Daily and according to Maintenance Plan during the Establishment Closure Phases	▪ ECA.
	Continued Employment	Manage through supporting workers	▪ Duration of employment contract	▪ SLP
Operational Phase				
Mining of sand resources Transportation of sand	Soil erosion	Avoid and control through: ▪ Vegetation establishment. ▪ Restrict access.	▪ As required and throughout the Operational Phase	▪ Soil Rehabilitation Plan; and ▪ Storm Water Management Plan in accordance with: ▪ MPRDA Regulation 56 (1) to (8); soil pollution and erosion control; and CARA

Project Activity	Potential Impact	Mitigation Type	Time period for implementation	Standards to be achieved
	Sedimentation of surface water resources	Avoid through: ▪ Implementation of buffer zones; and ▪ Erosion management through stormwater control.	▪ As required and throughout the Operational Phase	▪ Buffer zones; and ▪ Spill Response Plan in accordance with: ▪ NWA; and ▪ Best Practice Guidelines;
	Noise Generation	Control through: ▪ Operating hours; ▪ Use of silencers; and ▪ Routine maintenance and services.	▪ Daily and according to Maintenance Plan during the Establishment and Closure Phases	▪ ECA.
	Dust Generation	Control through: ▪ Dust Management Plan; ▪ Only remove necessary vegetation	▪ As required and throughout the Establishment Phase	▪ NEM:AQA

Project Activity	Potential Impact	Mitigation Type	Time period for implementation	Standards to be achieved
	Continued Employment	Manage through supporting workers	▪ During employment contract	▪ SLP
Rehabilitation Phase				
Rehabilitation (topsoil cover, ripping and vegetation establishment)	Establishment of Alien Invasive Species	Control through: ▪ Dust Management Plan. ▪ Vegetation establishment.	▪ Ongoing during closure phase.	▪ NEM:BA
	Noise Generation	Control through: ▪ Operating hours; ▪ Use of silencers; and ▪ Routine maintenance and services.	▪ Ongoing during closure phase	▪ ECA.

7 Financial Provision

7.1 Determination of the amount of Financial Provision

7.1.1 Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under the Regulations

The closure objectives have been formulated for the project, taking into account the baseline environment of the project site. The closure objectives for the project are as follows:

- Rehabilitate the mining sites to its natural or predetermined state, or to land use that conforms to the generally accepted principles of sustainable development through restoration, remediation, rehabilitation and stabilisation;
- Rehabilitate all disturbed land to a condition that facilitates compliance with applicable environmental quality objectives, such as air and water quality objectives;
- Reduce the visual impact of the mining site through rehabilitation of all disturbed land and residue deposits;
- Develop a retrenchment programme in a timely manner;
- Keep authorities informed of the progress of the activities during the Closure Phase;
- Submit monitoring results to the relevant authorities; and
- Maintain the required pollution control facilities and the condition of the rehabilitated land following closure.

7.1.2 Confirm specifically that the Environmental Objectives in relation to Closure have been consulted with landowner and Interested and Affected Parties

As part of the PPP, this Basic Assessment Report, along with the closure objectives, was provided for comment and review to I&APs and stakeholders.

7.1.3 Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main mining activities, including the anticipated mining area at the time of closure

The mining site will be rehabilitated concurrently meaning that as a new strip is mined the previous mined section will be rehabilitated. The rehabilitation process is summarised as follows:

- The open mine strip will be backfilled with topsoil;
- The site will be re-shaped, levelled and ripped to ensure there is no compaction;

- The topsoil will be spread over the site and the site vegetated with indigenous vegetation; and
- The site will be monitored for the success of the rehabilitation.

7.1.4 Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives

The rehabilitation plan has been compiled in support of the primary closure objective which is to rehabilitate the mining area to its natural or predetermined state, or to land use that conforms to the generally accepted principles of sustainable development through restoration, remediation, rehabilitation and stabilisation remediation of the impact land to a post-mining land use capable of supporting grazing activities.

7.1.5 Calculate and State the Quantum of the Financial Provision required to manage and Rehabilitate the Environment in accordance with the Applicable Guideline

The environmental closure liability for the project was calculated according to the DMR's "Guideline Document for the Evaluation of the Quantum of Closure-related Financial Provision Provided by a Mine".

The DMR Guideline format makes use of a set template for which defined rates and multiplication factors are utilised.

The 2005 DMR Master Rates were updated and published by the DMR in 2012 however, due to inflation, these are no longer accurate. During this assessment, the 2012 Master Rates, as published by the DMR, were updated by the average Consumer Price Index (CPI) as provided by Statistics South Africa (StatsSA) to reflect the situation at November 2015[11].

The DMR Guideline Document classifies a mine according to a number of factors which allows the determination of appropriate weighting factors to be used during the quantum calculation. The following factors are considered:

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

Table 7-1 provides a summary of the estimate calculated for each component for the proposed project.

[11] Latest CPI figures from StatsSA

Table 7-1: Environmental Liability for Copper Sunset's Operations according to the DMR Methodology

Financial Revision Calculation - Rehabilitation					
	Item	**Unit**	**Quantity**	**Rate**	**Cost**
1	Dismantling of processing plant & related structures (incl. overland conveyors & power lines)	m^3	76.10	12.82	R 976.00
2 A	Demolition of steel buildings & Structures	m^2	351.00	178.60	R 62 690.00
2 B	Demolition of reinforced concrete buildings & structures	m^2	125.00	263.20	R 32 900.00
5	Demolition of housing &/or administration facilities	m^2	2735.50	357.21	R 977 140.00
6	Opencast rehabilitation including final voids & ramps [(30m x 900m)*3 mining strips]	ha	2.10	187250.97	R 204 478.00
8 B	Rehabilitation of processing waste deposits & evaporation ponds (basic, salt producing waste)	ha	0.98	155478.46	R 152 369.00
13	Water management	ha	0.98	37600.60	R 24 689.00
14	2 to 3 years of maintenance & aftercare	ha	4.01	13160.21	R 52 763.00
Sub Total 1					**R 1 508 003.00**
1	Preliminary and General	12% of Sub Total 1	Weighting Factor 2	1.05	R 190 008.00
2	Administration & supervision costs	6.0% of Subtotal 1			R 90 480.00
3	Engineering drawings & specifications	2.0% of Subtotal 1			R 30 160.00
4	Engineering & procurement of specialist work	2.5% of Subtotal 1			R 37 700.00
5	Development of a closure plan	2.5% of Subtotal 1			R 37 700.00
6	Final groundwater modelling				
Sub Total 1 + 2					**R 1 894 052.20**
VAT (14%)					**R 265 167.31**
GRAND TOTAL (incl. VAT)					**R 2 159 219.50**

7.1.6 Confirm that the financial provision will be provided as determined

The applicant, Copper Sunset, has already provided the financial provision as determined in Section 7, Part B. Due to the decrease in length of the mining strips, as well as the continued concurrent rehabilitation to be undertaken, it is deemed that this figure is considered adequate for the expansion of the Mining Right area.

8 Monitoring compliance with and performance assessment

Copper Sunset will be responsible for the implementation of all of the monitoring of mitigation and management measures, as well as compliance with the EMP. The recommended monitoring for the identified impacts is detailed in Table 8-1. Copper Sunset will keep a record of all environmental monitoring carried out on site.

8.1 Monitoring of Impact Management Actions

The identified impacts that require monitoring programmes include the following:

- Site clearing and establishment:
  - Removal of vegetation; and
  - Soil erosion.
- Mining:
  - Soil erosion;
  - Dust and noise;
  - Water generated; and
  - Groundwater levels and quality.
- Heritage landscape;
- Hydrocarbon spillages;
- Domestic waste;
- Fires; and
- Rehabilitation.

Supervisors must be appointed to monitor the potential impacts of the above mentioned activities and Project Managers will foresee that all of the management plans are implemented. Once the mining activities have been completed, Copper Sunset will appoint an independent environmental officer to conduct a site visit to audit the rehabilitation and a report will be compiled and submitted to the DMR.

8.2 Monitoring and Reporting Frequency

Table 8-1 discussed the monitoring and reporting frequency for the management of impacts.

8.3 Responsible Persons

The roles and responsibilities with respect to the monitoring programme are discussed in Table 8-1.

8.4 Time Period for Implementing Impact Management Actions

Table 8-1 captures the time period for implementing the impact management actions.

8.5 Mechanism for Monitoring Compliance

The method for monitoring the implementation of the impact management actions, the frequency of monitoring the implementation of the impact management actions, an indication of the persons who will be responsible for implementation of the impact management actions, the time periods within which the impact management actions must be implemented and the mechanism for monitoring compliance with the identified impact management actions are summarised in Table 8-1.

Table 8-1: Monitoring and Management of Environmental Impacts

Source Activity	Impacts requiring monitoring programmes	Functional requirements for monitoring	Roles and responsibilities (For the execution of the monitoring programmes)	Monitoring and reporting frequency and time periods for implementing impact management actions
All project activities	Removal of vegetation	▪ Vegetation cleared from the mining site will be stored for rehabilitation or removed from the area should it not be adequate to use for rehabilitation. Only the necessary vegetation required for the mining activities will be cleared and indigenous trees will be avoided.	▪ Environmental Manager	Daily
	Soil erosion	▪ All topsoil removed will be stored in a stockpile and protected from erosion for use during rehabilitation. Daily site inspection will be undertaken by the site manager to ensure that all soil erosion mitigation measures are in place and implemented.	▪ Environmental Manager ▪ Soil Specialist	Daily
	Dust and Noise	▪ Dust suppression must be implemented and a dust monitoring network must be established; and ▪ Heavy machinery and vehicles must be maintained and serviced regularly and, if possible, a silencing system should be fitted. Mining must only take place during daylight hours, which are to be communicated to directly affected persons.	▪ Environmental Manager	Daily
	Access roads	▪ Traffic control measures must be implemented to prevent the occurrence of road accidents; and	▪ Environmental Manager	Daily

		▪ Machinery operators and drivers must be made aware of the possible safety hazards that they could pose		
	Heritage landscape	▪ A Watching Brief must be implemented during site establishment in the event that heritage resources are discovered. Identified heritage resources (historical structures, graves and Iron Age sites) must be avoided and a 50 m buffer implemented	▪ Environmental Manager	Daily during site establishment
	Use of hydrocarbons	▪ Spill tray will be placed under the machinery to collect any hydrocarbon leaks and spillages. Should spillages occur, the soil must be cleared and treated utilising bioremediation techniques. Should the soil not be adequately treated on site, the soil must be removed from the prospecting drill site and disposed of at a waste handling facility	▪ Environmental Manager	Daily
	Rehabilitation	▪ Review of rehabilitation after each mining strip has been rehabilitated	▪ Environmental Manager	After the completion of each prospecting activity

9 Indicate the frequency of the submission of the performance assessment/ environmental audit report

A performance assessment report for the project will be submitted on an annual basis to the DMR during Establishment and during Operational Phase.

10 Environmental Awareness Plan

10.1 Manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work

Copper Sunset has developed Environmental, Health and Safety Policies. The Environmental Policy will be communicated to all personnel, whether they are contractors or permanent staff, and the policy will be erected at each active mining site.

Employees will receive general environmental awareness training on specific items contained in this EMP, as well as on Best Possible Environmental Practices (BPEP).

10.1.1 Specific Environmental Training

Environmental Awareness Training will be undertaken to make employees and contractors aware of the following:

- The importance of conforming with the environmental policy and procedures and with the requirements of the EMP;
- The significant social and environmental impacts of their work activities and the environmental benefits of improved personal performance;
- Their roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirements of the environmental management system;
- The potential consequences of departure from specified operating procedures; and
- Possible archaeological finds action steps for mitigation measures, surface collections, excavations and communication routes to follow in the case of a discovery.

The guidelines for training are summarised below, which are in line with the ISO 14001:2004 guidelines with regards to training and awareness creation.

Table 10-1: Training Guidelines

Types of Training	Audience	Purpose
Raising awareness of the strategic importance of environmental management	Senior management	To gain commitment and alignment to the organisation's environmental policy.
Raising general environmental awareness	All employees	To gain commitment to the environmental policy and objectives and to instil a sense of individual responsibility.
Skill enhancement	Employees with environmental responsibilities	To improve performance in specific tasks.
Compliance	Employees whose actions can affect compliance	To ensure that regulatory and internal requirements for training are met.

The training programme will consist of the following elements:

- Identification of employee training needs;
- Development of a training plan to address defined needs;
- Verification of conformance of the training programme to regulatory or organisation requirements and standards;
- Training of target employee groups;
- Documentation of training received; and
- Evaluation of training received.

This training is undertaken on an annual basis for all personnel, together with the annual required induction programmes. The training material provided will be subject to annual review, based on issues such as incidents, accidents, new legislative requirements, modified processes and environmental and social aspects identified from time to time. This training is to be carried out and coordinated internally by Copper Sunset.

Copper Sunset will, therefore, develop the capabilities and support mechanisms necessary to achieve its environmental policy, objectives and targets.

In addition, an Emergency Preparedness Plan will be communicated and trained to all site personnel during the induction process.

10.2 Manner in which risks will be dealt with to avoid pollution or the degradation of the environment

An Emergency Response Plan has been developed and is the approach used by Copper Sunset to respond to risks that may pollute or degrade the environment during the operational phase.

11 Specific information required by the Competent Authority

The financial provision for the environmental rehabilitation and closure requirements of mining operations is governed by National Environmental Management Act, 1998, Act 107 of 1998), as amended, (NEMA) which provides in Section 24P that the holder of a mining right must make financial provision for rehabilitation of negative environmental impacts. The financial provision will be reviewed annually.

12 Undertaking

The EAP, Duncan Pettit, herewith confirms:-

- the correctness of the information provided in the reports
- the inclusion of comments and inputs from stakeholders and I&APs ;
- the inclusion of inputs and recommendations from the specialist reports where relevant; and
- the acceptability of the project in relation to the finding of the assessment and level of mitigation proposed.

Signature of the Environmental Assessment Practitioner:	
Name of Company:	Digby Wells Environmental
Date:	June 2016

Appendix D: Public Participation

1 Public participation for the proposed copper sunset amendment application

As part of the Public Participation Process (PPP), the actions as set out below will be undertaken.

Development of a **stakeholder database** by means of:

- Windeed searches for farm portions in and around the project site to verify land ownership and obtain contact details (use of existing available stakeholder databases where possible);
- Desktop and online research; and
- Stakeholder networking and discussions to source additional stakeholder details.

Stakeholders are identified in Table 1.

Directly and indirectly affected landowners, land occupiers, key stakeholders, tribal authorities, district and local municipality(s), national and provincial authorities, Parastatals, NGOs and CBOs will be notified of the project by means of a Background Information Letter (BIL) with a comment and registration form. These documents will be distributed via email, post and fax and will also be made available on the Digby Wells website (www.digbywells.com). An SMS will be sent to everyone on the database who has a cell phone number.

Site notices in line with the EIA Regulations, 2014 will be placed at, and directly around, the project site.

An advertisement will be placed in one local newspaper (Vaalweekblad), notifying stakeholders of the project, inviting comments and to register as an Interested and Affected Parties (I&APs).

I&APs will be notified of the availability of the Amendment Report through email, sms, post and fax for public comment (30 days). The Report will be made available publicly at the following venues:

- Zamdela Local Library;
- Vereeniging Public Library; and
- Digby Wells website.

The Project will be announced to the public on 01 November 2017. Proof of the notifications and any comments received will be included in the updated amendment report.

Table 1: I&P Database

Category	Company	Mr/Ms	First Name	Last Name	Position
Directly Affected Landowner	Anglo Operations Proprietary Limited	Mr	Fanie Stephanus	Kitching	Manager:Witbank Estates
Industry and Commerce	Anglo Operations Proprietary Limited	Ms	Nicola	Torley	
Industry and Commerce	Anglo Operations Proprietary Limited	Mr	Danelle	Tyler	
Environmental NGO's	Birdlife Africa	Mr	Simon	Gear	Policy and Advocacy
Industry and Commerce	Chamber of Commerce	Mr		Konziwe	Free State Representative
Community Based Organisations	Congress of South African Trade Unions(COSATU)	Ms	Monyatso	Mahlatsi	Provincial Secretary
Provincial Government	Department of Economic Development, Tourism & Environmental Affairs	Mr	T	Lekgari	Environmental officer
Provincial Government	Department of Economic Development, Tourism & Environmental Affairs	Ms	G	Mkhosana	Acting Director
Provincial Government	Department of Economic Development, Tourism & Environmental Affairs	Ms	Ntswake	Khomo	Environmental Officer
National Government	Department of Environmental Affairs (DEA)	Mr	Lucas	Mahlangu	Control Environmental Officer
Provincial Government	Department of Health	Mr	Obed	Modiko	Director
Provincial Government	Department of Minerals Resources (DMR)	Mr	Tshepo	Moloto	Assistant Director
Provincial Government	Department of Minerals Resources (DMR)	Ms	A	Nemulodi	Case Officer
Provincial Government	Department of Public Works	Ms	Nonhlanhla	Sgudu	Director
Provincial Government	Department of Rural Development and land Reform (DRDLR)	Mr	Khomotso	Mahlatsi	Land Claims Commission
Provincial Government	Department of Rural Development and land Reform (DRDLR)	Mr	L H	Maphutha	Regional Land Claims Commissioner
National Government	Department of Water and Sanitation (DWS)	Mr	Lesiba	Mabona	Case Officer
National Government	Department of Water and Sanitation (DWS)	Mr	Phillimon	Khwinana	Control Environmental Officer
National Government	Department of Water and Sanitation (DWS)	Dr	Paul	Meulenbeld	Regional Head
National Government	Department of Water and Sanitation (DWS)	Mrs	Nosibusiso	Mfunywan	
National Government	Department of Water and Sanitation (DWS)	Mr	Londolani	Mutshekwa	Water Quality Management
Education Sector	Education	Prof	Johan	Fick	
Environmental NGO's	Endangered Wildlife Trust (EWT)	Ms	Reynette	Coetzee	

Industry and Commerce	Eskom Holdings	Mr	Benito	Wiilams	Senior Environmental Specialist
Industry and Commerce	Eskom Holdings	Ms	Saba	Paseletso	Senior Advisor
Environmental NGO's	Federation of Sustainable Environment (FSE)	Ms	Mariette	Liefferink	Chief Executive Officer
District Municipality	Fezile Dabi District Municipality	Mrs	TH	Hlapolosa	Manager: Monitoring and Evaluation
District Municipality	Fezile Dabi District Municipality	Ms	LM	Molibeli	Municipal Manager
District Municipality	Fezile Dabi District Municipality	Ms	Reatile	Ralepeli -	LED Manager
District Municipality	Fezile Dabi District Municipality	Mr	Chakane	Sibaya	Director
District Municipality	Fezile Dabi District Municipality	Mr	Andre	van Zyl	Deputy Manager
Local Municipality	Fezile Dabi District Municipality	Mr	Mcebo	Mkhatshwa	Senior. Environmental Management Office
Agricultural Union	Free State Agricultural Union	Dr	Jack	Armour	Operations Manager
Provincial Government	Free State Department of Minerals Resources	Mrs	Sibongile	Mthombeni	Acting Regional Manager
Provincial Government	Free State Department of Minerals Resources	Mr	Shawn	Janneker	Mineral Regulation
Provincial Government	Land Restitution Support (Free State Province)	Ms	Lezzane	Naran	Chief Director
Provincial Government	Land Restitution Support (North West)	Mr	Lengane	Bogatsu	Chief Director
Local Municipality	Metsimaholo Local Municipality	Mr	Brutus	Mahlaku	Mayor
Local Municipality	Metsimaholo Local Municipality	Mr	Philimon	Thile	Environmental & Waste Manager
Local Municipality	Metsimaholo Local Municipality	Mr	Sello	Mokoena	IDP Manager
Local Municipality	Metsimaholo Local Municipality	Mr	Stephen	Molala	Municipal Manager
Local Municipality	Metsimaholo Local Municipality	Ms	Pretty	Mbatha	
Local Municipality	Metsimaholo Local Municipality	Ms	Thakane	Nkoli	Secretary:MunicipalManager
Local Municipality	Metsimaholo Local Municipaliy		Gino	Alberts	Communications Manager
Local Municipality	Metsimaholo Local Municipaliy	Mr	Sonnyboy	Mokgatle	Director
Local Municipality	MetsimaholoLocal Municipality	Mr	Steve	Molala	Municipal Manager
Community Based Organisations	National Union of Mineworkers(NUM)	Ms	Maria	Lithlakanyane	
Provincial Government	SA National Road Agency (SANRAL)	Mr	Khathu	Ramavhoya	Environmentalist
Health Sector (Clinic, hospital, doctor)	Sasolburg Clinic	Ms	Malatse	Virginia	Primary Health Manager
Library	Sasolburg Public Library	Ms	Estelle	Boers	Librarian
Environmental NGO's	Save the Vaal	Mr/Mrs		Thomas	

Provincial Government	South African Heritage Agency (SAHRA)	Mr	Andrew	Salomon	Heritage officer
Provincial Government	South African Heritage Agency (SAHRA)	Mr	Genna	Lavin	Heritage Officer
Business and commerce	Transnet Freight Rail	Ms	Phindile	Mnguni	
Business and commerce	Transnet Freight Rail	Mr	Francis	Rahlapane	Risk Manager
Library	Vereeniging Public library	Ms	Adeilen	Mokhotho	Principal Librarian
Environmental NGO's	World Wildlife Fund SA (WWF)	Mr	Colleen	van Schalkwyk	
Environmental NGO's	World Wildlife Fund SA (WWF)	Ms	Louise	Naude	
Health Sector (Clinic, hospital, doctor)	Zamdela Clinic	Ms	Olivia	Letsholo	General Manager
Library	Zamdela Local Library	Ms	Selloane	Mohapi	
Provincial Government	Office of the Regional Land Claims Commissioner	Ms	Rebaone	Ramotswa	Office Assistant: Chief Director's office
Business and commerce	New Vaal Colliery	Ms	Chantelle	Gerber	Mineral and Prospect Rights Manager

Appendix E: Other Relevant Approvals

Appendix E1: Environmental Authorisation

Appendix E2: Approval by the Mine Health and Safety Principal Inspector of Mines to mine within the 100m restriction zones from certain roads, electric pylons and other infrastructure

Appendix E3: Approval from Eskom

mineral resources
Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

Private Bag X33, Welkom, 9460, Tel: 057 391 1356, Fax: 057 357 6003
The Strip Building, 314 Stateway Street, Welkom, 9459

Enquiries: Ms A Nemulodi Ref: FS 30/5/1/2/3/2/1 (164) EM
E-Mail Address: azwihangwisi.nemulodi@dmr.gov.za
Sub-Directorate: Mine Environmental Management

BY HAND

The Directors
Copper Sunset Sands (Pty) Ltd
P.O. Box 413712
Craighall
Johannesburg
2024

Attention: Mr. R. Wolter

Fax no: 011 326 4647

AMENDED ENVIRONMENTAL AUTHORISATION IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (NEMA) AS AMENDED, AND THE ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REGULATIONS, 2014 FOR MINING SAND (GENERAL) ON THE REMAINDER OF THE FARM BANKFONTEIN 9, A PORTION OF THE FARM ZANDFONTEIN 259 AND A PORTION OF THE FARM RIETFONTEIN 152 WITHIN SASOLBURG LOCAL MUNICIPALITY OF THE FREE STATE REGION.

With reference to the abovementioned application, please be advised that the Department has decided to **grant** an amended environmental authorisation in terms of the National Environmental Management Act (Act 107 of 1998). The amended environmental authorisation and reasons for the decision are attached herewith.

In terms of regulation 4 (2) of the Environmental Impact Assessment Regulations of 2014, you are instructed to notify all registered interested and affected parties, in writing within 14 (Fourteen) calendar days, from the date of the Department's decision in respect of your application and the relevant provisions regarding the lodgement of an appeal must be provided for in terms of the National Appeal Regulations of 2014.

Should you wish to appeal any aspect of the decision, you must submit the appeal to the Minister of Environmental Affairs and a copy of such appeal to the Department of Mineral Resources (Free State Regional Office), within 20 days from the date of notification, and such appeal must be lodged as prescribed in by Chapter 2 of the

National Appeal Regulations of 2014, by means of the methods as per prescribed below:

Appeal to the Department of Environmental Affairs

Attention : Directorate Appeals and Legal Review
Email : appealsdirectorate@environment.gov.za
By post : Private Bag X 447, **PRETORIA**, 0001
By hand : Environmental House, Corner Steve Biko and Soutpansberg Street, Arcadia, **Pretoria,**
0083

Copy of the lodged appeal to the Department of Mineral Resources

Attention : Regional Manager: Free State Region
By facsimile : 057 357 6003
E-mail : mamokete.mpatane@dmr.gov.za
By post : Private Bag X33, Welkom, 9460
By hand : The Strip Building, 314 Stateway Street, Welkom, 9459

Should you decide to appeal, you must comply with the National Appeal Regulation of 2014 in relation to notification of all registered interested and affected, and a copy of the official appeal form can be obtained from the Department of Environmental Affairs.

Kind Regards

.....
REGIONAL MANAGER: MINERAL REGULATION
FREE STATE REGIONAL OFFICE
DATE: 20/12/2016

mineral resources
Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

Private Bag X33, Welkom, 9460, Tel: 057 391 1356, Fax: 057 357 6003
The Strip Building, 314 Stateway Street, Welkom, 9459

AMENDED ENVIRONMENTAL AUTHORISATION

Reference number:	FS 30/5/1/2/3/2/1 (164) EM
Last amended:	08th of March 2016
Holder of authorisation:	Copper Sunset Sands (Pty) Ltd
Location of activity:	Reminder of Bankfontein 9, a portion of andfontein 2 259 and Rietfontein 152.

DECISION

ACRONYMS

NEMA:	The National Environmental Management Act, 1998 (Act 107 of 1998), as amended
DEPARTMENT:	Department of Mineral Resources
EA:	Environmental Authorisation
IEA	Integrated Environmental Authorisation
EMPr:	Environmental Management Programme
BAR:	Basic Assessment Report
S&EIR:	Scoping and Environmental Impact Report
I&AP:	Interested and Affected Parties
ECO:	Environmental Control Officer
SAHRA:	South African Heritage Resources Agency
EIA REGULATIONS:	EIA Regulations, 2014
MPRDA:	Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002), as amended
NEMA:WA:	National Environmental Management: Waste Act, 2008 (Act 59 of 2008), as amended
EIA:	Environmental Impact Assessment.

The Department is satisfied, on the basis of the information available to it and subject to compliance with the conditions of this amended environmental authorisation, that the company should be authorised to undertake **NEMA EIA** listed activity (ies) specified below. Details regarding the basis on which the Department reached this granting decision are set out in **Annexure "1"** and **"2"** of this amended environmental authorisation.

ACTIVITY APPLIED FOR

By virtue of the powers conferred on it by NEMA, the Department hereby Grants an amended EA to **Copper Sunset Sand (Pty) Ltd** with the following contact details –

The Directors
Copper Sunset Sand (Pty) Ltd
P.O. Box 413712
Craighall
2024

Contact person:	**Mr. R. Wolter**
Tel:	**011 787 9274**
Fax:	**011 787 9274**
E-mail:	**rudiw@mweb.co.za**

to undertake the following activity listed in the NEMA EIA Regulation 2014.

NEMA: LISTED ACTIVITIES:

Listed in the EIA Regulations 2014 R. 983 of 2014 as:-

Activity 27 - "The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for

i. the undertaking of a linear activity; or
ii. Maintenance purposes undertaken in accordance with a maintenance management plan.

Detailed specifications of the activity are as follows:

Proposed activity details are as follows:
Area under application- 19.9 ha
Establishment phase: Site clearance: Removal of vegetation and topsoil of up to 350mm,

Stockpiles of topsoil and removed vegetation along the strip, Access roads of less than 8m wide and approximately 600m long.
Operational Phase: The following equipment will be used: Bulldozer, Wheel Loader, Excavators, Graders, Articulated trucks, Tipper trucks, and tractor load backhoe. **Mining operation:** Screening of sand in the existing processing plant, Transportation of sand from the proposed area to the existing mining area, Concurrent rehabilitation.
Rehabilitation phase: Backfilling of excavations, Contouring and levelling of the area to resemble the original landscape and to be free drainin Spreading of stockpiled topsoil, Re-vegetation
Coordinates: W.G.S 27°

-92 362.92	**2 959 846.12**
-92 462.39	**2 959 763.57**
-92 503.52	**2 959 418.17**
-92 671.06	**2 959 426.79**
-92 860.10	**2 959 426.79**
-93 037.17	**2 959 506.02**
-93 065.99	**2 959 541.83**
-92 503.51	**2 960 001.61**

The granting of this amended EA is subject to the conditions set out below (site specific) and in **Annexure 2** (Departmental standard conditions).The Environmental Management Programme (EMPr) attached as part of reports for the above development submitted as part of the application for an amended EA is hereby approved and must be adhered to throughout the life cycle of the operation.

AMENDED EA SITE SPECIFIC CONDITIONS

1. Protected plant species such as Boophone distcha (poison bulb) mentioned on the report must not be removed (disturbed, cut and destroy their products which may not be possessed, collected, removed, transported, exported, donated, purchased or sold) unless

the necessary permission is granted by the Department of Agriculture, Forestry and Fisheries (DAFF).

2. Indigenous animals and birds that are found in the area must not be harmed and must be protected as far as it is practicable.

ANNEXURE 1: REASONS FOR THE DECISION

1. Background

Copper Sunset Sands (Pty) Ltd submitted an EA amendment application for activities listed in the EIA Regulations 2014 as:

Listed in the EIA Regulations 2014 R. 983 of 2014 as:-

Activity 27 - "The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for

i. the undertaking of a linear activity; or
ii. Maintenance purposes undertaken in accordance with a maintenance management plan.

Copper Sunset Sands (Pty) appointed Digby Wells Environmental to undertake the Basic Assessment process as required by Regulation 12 of the EIA Regulations 2014.

2. Information considered in making the decision

In reaching its decision, the Department took, *inter alia,* the following into consideration -

a) The information contained in the BAR received by the Department on 14 July 2016;

b) The revised BAR submitted to this office on the 07th of December 2016;

c) The objectives and requirements of the applicable and relevant legislation, policies and guidelines and the EIA Regulations of 2014;

d) Public Participation Process (PPP) attached in the BAR and EMPr reports.

e) The consultation letter dated 28 July 2016 and the acceptance of application notification dated 25 July 2016 received from mineral law administration;

f) Relevant information contained in the Departmental information database, including, the Department's circular on the One Environmental Management System dated 8 December 2014.

g) The Heritage impact Report attached to the BAR and EMPr as Appendix D;

h) The sense of balance of the negative and positive impacts and mitigation measures;

i) The Environmental Emergency Procedure Report included in the BAR and EMPr report,

j) The Environmental Awareness Plan Report included to the BAR and EMPr report,

k) The company has determined the financial provision as required in terms of the Financial Provisioning Regulations, 2015. Moreover an amount of R 485, 741.00 was calculated to be the environmental liability associated with this EA. Furthermore an existing financial provision which was submitted in a form of a financial guarantee issued by Nedbank to an amount of R 2, 159, 219.50 was provided for the existing operation prior to the lodgement of this EA application to cater for rehabilitation purposes. The amount kept by this office is deemed sufficient to cater for the rehabilitation and/or management of negative environmental impacts.

3. Key factors considered in making the decision

All the information presented to the Department was taken into account upon the Department's consideration of the application. A summary of the issues which, in the Department's view, were of the most significance are set out below.

a) A sufficient Public Participation Process (PPP) was undertaken and the company has satisfied the minimum requirements as prescribed in the EIA Regulations 2014 R 982 of 2014 for public involvement;

b) The environmental impacts associated with the activity will be addressed by the implementation of mitigation measures outlined in the BAR submitted to the department on the 14th of July 2016 and the revised BAR submitted on the 07th of December 2016.

c) The Environmental Emergency Procedure Report contained in the BAR and EMPr dated 14 July 2016 and 07 December 2016; compiled by Digby Wells Environmental; summarised all the minimum requirements for emergency preparedness and response and to ensure employees are informed of correct, proper and safe manner to operate the tasks at hand; and

d) The Environmental Awareness Plan Report contained in the BAR and EMPr dated 14 July 2016 and 07 December 2016; compiled by Digby Wells Environmental is in support of development.

4. Findings

After consideration of the information and factors listed above, the Department made the following findings –

a) The potential impacts on the site were clearly investigated and mitigation measures outlined.

b) The Public Participation Process complied with Chapter 6 of the EIA Regulations 2014 R 982. The PPP included, *inter-alia*, the following:

- Identification of and engagement (public meeting) with Interested and Affected Parties (I&Aps);
- Fixing a notice board at the site and any alternative site where the listed activity is to be undertaken;
- Giving written notice to the owners and occupiers of land adjacent to the site and any alternative site where the listed activity is to be undertaken, the municipality, and the various Organs of State having jurisdiction in respect of any aspect of the listed activity;
- The placing of a newspaper advertisement on the 8th of June 2016;

ANNEXURE 2: DEPARTMENTAL STANDARD CONDITIONS

1. SCOPE OF AUTHORISATION

1.1. The holder of the amended EA shall be responsible for ensuring compliance with the conditions contained in the amended EA. This includes any person acting on the holder's behalf, including but not limited to an agent, servant, contractor, subcontractor, employee, consultant or any person rendering a service to the holder of amended EA.

1.2. **Any changes to, or deviation from the project description set out in this amended EA must be approved in writing by this Department before such changes or deviation may be effected. In assessing whether to grant such approval or not, the Department may request such information as is deems necessary to evaluate the significance and impacts of such changes or deviation and it may be necessary for the holder of the amended EA to apply for further authorisation in terms of the amended EIA Regulations 2014.**

1.3. The activities, which are authorised, may only be carried out at the property (ies) indicated in the amended EA and or on the approved amended EMPr.

1.4 Where any of the holder of the amended EA contact details change including name of the responsible person, physical or postal address/ or telephonic details, the holder of the amended EA must notify the Department as soon as the new details become known to the holder of the amended EA.

1.5 The amended EA does not negate the responsibility of the holder to comply with any other statutory requirements that may be applicable to the undertaking of such activity (ies).

1.6 The holder of the amended EA must ensure that all areas where the authorised activities occur have controlled access to ensure safety of people and animals.

2 APPEAL OF AUTHORISATION

2.1 The holder of the amended EA must in writing, within 14 (fourteen) calendar days from the date of this decision and in accordance with EIA Regulation 4(2) 2014 do the following:

2.2 Notify all registered I&APs of –

2.2.1 The outcome of the application;

2.2.2. The date of the decision;

2.2.3. The date of issue of the decision and;

2.2.4 The reasons for the decision as included in Annexure 1 and Departmental Standard Conditions in Annexure 2.

2.3 Draw the attention of all registered I&APs to the fact that an appeal may be lodged against the decision in terms of the National Appeals Regulations,

2.4 Draw the attention of all registered I&APs to the manner in which they may access the decision.

2.5 Provide the registered I&APs with:

2.5.1 Name of the holder (entity) of this EA

2.5.2 Name of the responsible person for this EA

2.5.3 Postal address of the holder;

2.5.4 Telephonic and fax details of the holder and

2.5.5 E-mail address of the holder if any.

3 COMMENCEMENT OF THE ACTIVITY (IES)

3.1 In order to ensure safety, all employees must be given the necessary personnel protective equipment (PPE).

3.2 This amended EA must be provided to the site operator and the requirements thereof must be made fully known to him or her.

3.3 Hauling routes for construction vehicles and machinery must be clearly marked and appropriate signalling must be posted to that effect. Furthermore, movement of construction vehicles and machinery must be restricted to areas outside of the drainage line or wet areas.

3.4 Appropriate notification sign must be erected at the construction site, warning the public (residents, visitors etc.) about the hazard around the construction site and presence of heavy vehicles and machinery.

3.5 Construction must include design measures that allow surface and subsurface movement of water along the drainage lines so as not to impede natural surface and subsurface water flow, and drainage measures must promote the dissipation of storm water runoff.

3.6 Vegetation clearance must be limited on areas where the individual activities will occur, and mitigation measures must be implemented to reduce the risk of erosion and alien species invasion.

3.7 The holder of the EA must note that in terms of the National Forest Act (Act No.84 of 1998) protected plant species, also listed in must not be cut, disturbed, damaged, destroyed and their products must not be possessed, collected, removed, transported, exported, donated, purchased or sold unless permission is granted by the Department of Agriculture, Forestry and fisheries.

3.8 Construction areas (e.g. material lay down areas), topsoil and subsoil must be protected from contamination or pollution. Stockpiling must not take place in drainage lines or areas where it will impede surface water runoff.

3.9 If any soil contamination is noted at any phase of the proposed activity (ies), the contaminated soil must be removed to a licensed waste disposal facility and the site must be rehabilitated to the satisfaction of the Department and Department of Water and Sanitation. The opportunity for the onsite remediation and re-use of contaminated soil must be investigated prior to the disposal and this Department must be informed in this regard.

3.10 An integrated waste management approach must be implemented that is based on waste minimization and must incorporate avoidance, reduction, recycling, treat, reuse and disposal where appropriate. Uncontaminated rubble generated on the premises can be re-used as back filling material on site. Ensure that no refuse or rubble generated on the premises is placed, dumped or deposited on the adjacent properties or public places and open space.

3.11 In terms of sections 28 and 30 of NEMA, and sections 19 and 20 of the National Water Act, 1998 (Act No. 36 of 1998), any costs incurred to remedy environmental damage must be borne by the person responsible for the damage. It is therefore imperative that the holder of the EA reads through and understand the legislative requirements pertaining to the project. It is the holder of EA responsibility to take reasonable measures which include informing and educating contractors and employees about environmental risks of their work and training them to operate in an environmentally acceptable manner.

3.12 Construction vehicle must be serviced and maintained in the manner whereby no excessive smokes and noise production is reduced to acceptable levels, and to prevent oil leaks. Contaminated soil must be remediated on site or removed to an authorised landfill site.

3.14 Residents (if any) on the property (ies) and surrounding areas must be informed if any unusually noisy activities are planned.

3.15. Dust suppression measures must be implemented on all exposed surface to minimize and control airborne dust.

3.16 Mixing of cement, concrete, paints, solvent, sealants and adhesive must be done in specified areas on concrete aprons or on protected plastic linings to contain spillage or overflow onto soil to avoid contamination of underground water and environmental damage.

3.17 Should any heritage remains be exposed during operation or any actions on the site, these must immediately be reported to the South African Heritage Resource Agency (SAHRA) and (in accordance with the applicable legislation). Heritage remains uncovered or disturbed during earthworks must not be further disturbed until the necessary approval has been obtained from the South African Heritage Resource Agency (SAHRA). Heritage remains include: archaeological remains (including fossil bones and fossil shells); coins; middens, indigenous and/or colonial ceramics; any articles of value or antiquity; marine shell heaps; stone artifacts and bone remains; structures and other built features; rock art and rock engravings; shipwrecks; and graves or unmarked human burials. A qualified archaeologist must be contracted where necessary (at the expense of the company and in consultation with the relevant authority) to remove any human remains in accordance with the requirements of the relevant authority.

3.18 Care must be taken to ensure that the material and excavated soil required for backfilling are free of contamination from hydrocarbons.

3.19 Hydraulic fluid or chemicals required during construction must be stored in a concrete lined surface with bund walls and shall be designed in such a manner that any spillage can be contained and reclaimed without any impact on the surrounding environment. Should any spills occur it should be cleaned immediately by removing spillage together with the polluted solids and dispose it in the authorised disposal site permitted of such waste. The regional office of the Department of Water and Sanitation must be notified within 24 hours of an incident that may pollute surface and underground water resources.

3.20 Chemical sanitation facilities or system such as toilets that do not rely on the seepage of liquids must be provided with a ratio of 1 for every 15 workers. These must be placed such that they prevent spills or leaks to the environment and must be maintained according to the operating instructions and the content thereof must be disposed of at an authorised waste water treatment works.

3.21 The holder of the amended EA must ensure that any water uses listed in terms of Section 21 of National Water Act must get authorization from Department of Water and Sanitation prior to the commencement of such activity (ies).

3.22. This amended EA does not purport to absolve the holder of the amended EA from its common law obligations towards the owner of the surface of land affected.

3.23. The holder of the amended EA must ensure that rehabilitation of the disturbed areas caused by operation at all times comply with the approved EMPr.

3.24. This amended EA may be amended or withdrawn at any stage for non-compliance and provides no relief from the provisions of any other relevant statutory or contractual obligations.

3.25. The holder of the amended EA must note that in terms Section 43A of the National Environmental Management: Waste Act, 2008 (Act No.59 of 2008), residue deposit and residue deposit must be deposited and managed in a prescribed manner on any site demarcated for that purpose in the Environmental Management Plan or Environmental Management Programme. No person may temporary or permanently deposits residue stockpile or residue deposit on any area or site other than on site indicated on the Environmental Management Plan or Environmental Management Programme.

3.26. The holder of the amended EA must note that in terms Section 20 of the National Environmental Management: Waste Act, 2008 (Act No.59 of 2008), no person may commence, undertake or conduct a waste management activity, except in accordance, with the requirements of norms and standards determined in terms of Section 19 (3) for that activity or a waste management licence is issued in respect of that activity if licence is required.

3.27. An appeal under Section 43 (7)of the National Environmental Management Act (NEMA), Act 107 of 1998 (as amended) suspend an EA or exemption or any provisions of conditions attached hereto, or any directive unless the Minister directs otherwise.

3.28. Should you be notified by the Minister of a suspension of the authorisation pending appeal procedure, you may not commence with the activity (ies) until such time that the Minister allows you to commence with such activity (ies) in writing.

3.29 The Department reserves the right to audit and/or inspect the activity (ies) without prior notification at any reasonable time and at such frequency as may be determined by the Regional Manager.

3.30 The waste storage site must have a firm, impermeable, chemical resistant floors and a roof to prevent direct sunlight and rain water from getting in contact with the waste.

3.31 The storage of hydrocarbons must have bund walls with adequate capacity to contain the maximum volume that is stored in the area. Uncontaminated storm water must be prevented from coming into contact with the waste and must be diverted away from the storage site.

3.32 Subject to the commencement and duration requirements of the MPRDA and NEMA for the listed Prospecting activity is valid for the period for which the aforesaid Right is granted provided that this activity must commence within 10 years. If the commencement of the proposed activity does not occur within the specified period, the EA lapses and a new application for EA in terms of the NEMA and the EIA Regulations should be made for the activity to be undertaken.

3.33 The listed activity (ies), including site preparation, must not commence within 20 (twenty) calendar days of the date of the notification of the decision being sent to the registered I&APs. In the event that an appeal is lodged with the appeal administrator, the effect of this environmental authorisation is suspended until such time as the appeal is decided.

3.34 Should there be any conflicting conditions between this amended EA and other approval granted by other authorities, it is upon the holder of the amended EA to bring it to the attention of the Department for resolution.

3.35 This amended EA must be read in conjunction with the EA issued on the 08th of March 2016.

3.35 Invasive and alien plant species must be eradicated at all times during the life of the mine.

3.36 No Mining activities must be done within 50m of the wetland.

3.37 **This amendment only covers an area of 19.9ha and no mining activities must be conducted beyond the 19.9ha without approval from this office.**

4. MANAGEMENT OF ACTIVITY (IES)

4.1 A copy of the amended EA and EMPr must be kept at the property or on site office where the activity (lies) will be undertaken. The amended EA and EMPr must be produced to any authorised officials of the Department who request to see it and must be made available for inspection by any employee or agent of the holder of the amended EA who works or undertakes work at the property (ies).

4.2. The content of the EMPr and its objectives must be made known to all contractors, subcontractors, agent and any other people working on the site, and any updates or amendments to the EMPr must be submitted to the Department for approval.

4.4 Regular monitoring and maintenance of storm water drainage facilities must be conducted at all times, if damaged as directed by the Department or any other relevant authority.

4.5 A buffer zone of 100 metres between the activity (ies) and the residential areas, cemeteries or burial grounds, Eskom power lines and the fuel pipe line must be clearly demarcated and maintained.

4.6 The holder of the amended EA must prevent nuisance conditions or health hazards, or the potential creation of nuisance conditions or health hazards.

4.7 The holder of the amended EA must ensure that all non-recyclable waste are disposed of at waste management facilities licenced to handle such wastes and all recyclable waste are collected by licenced waste management facilities for recycling, reuse or treatment.

4.8 The holder of the amended EA must ensure that all liquid wastes, whose emissions to water or land could cause pollution are diverted to sewer, after testing water quality and receiving written approval from the relevant local authority.

4.9 Non-compliance with any condition of this amended EA or EMPr may result in the issuing of a directive in terms of section 28 and or a compliance notice in terms of section 31L of NEMA.

4.10 Only listed activities that are expressly specified in the EMPr that forms part of this EA may be conducted, and additional or new activities not specified herein must be applied for by the holder and authorised by the competent authority in the form of an amendment to the aforesaid EMPr before such activities may be commenced with. This condition is also applicable in the case of the amendment, addition, substitution, correction, and removal or updating of any detail in the aforesaid EMPr.

4.11 Rehabilitation of the disturbed surface caused by operation at all times must comply with the approved EMPr.

4.12 The Holder of the amended EA must ensure that the name and contact details of the ECO is made available to the Regional Manager within 30 days of commencement.The holder of the amended EA must also ensure that an ECO is always available on site to ensure that activity (ies) at all times comply with the issued amended EA and approved EMPr.

4.13 **The ECO must:**

4.13.1 Keep and maintain a detailed incidents register (including any spillages of fuels, chemicals or any other material.

4.13.2 Keep a complaint register on site indicating the complaint and how the issues were addressed, what measures were taken and what the preventative measures were implemented to avoid re-occurrence of complaints.

4.13.3 Keep records relating to monitoring and auditing on site and avail them for inspection to any relevant authorised officials.

4.13.4 Keep copies of all environmental reports submitted to the Department.

4.13.5 Keep the records of all permits, licences and authorisations required by the operation.

4.13.6 Compile a monthly monitoring report and make it available to the Department if requested.

4.14 The duties and responsibility of the ECO should not be seen as exempting the holder of the amended EA from the legal obligations in terms of the NEMA

4.15 The footprint of the activity (ies) must be limited on the areas authorised for the actual construction works and operational activities and all areas outside of the footprint must be regarded as a "no go" areas.

4.16. Erosion and soil loss must be prevented by minimizing the construction site exposed to surface water run-off. Where necessary erosion stabilizing action such as gabions or re-vegetation must be implemented to prevent further habitat deterioration.

4.17 The holder of the amended EA must ensure that all personnel who work with hazardous waste are trained to deal with these potential hazardous situations so as to minimize the risk involved. Records of training and verification of competence must be kept by the holder the amended EA.

4.18. In order to prevent nuisance conditions, the holder of the amended EA must ensure that all storage skips and bins are not overfilled.

5 REPORTING TO THE DEPARTMENT

5.1 The holder of the amended EA must:

5.1.1 submit and Environmental Audit Report to this Department annually and such report must be done by qualified Environmental Assessment Practitioner and must the audit report must specify whether conditions of this environmental authorisation and EMPr/closure plan are adhered to;

5.1.2 identify and assess any new impacts and risks as a result of undertaking the activity/ies, if applicable;

5.1.3 identify shortcomings in the EMPr/closure plan, if applicable;

5.1.4 identify the need, if any, for any changes to the management, avoidance and mitigation measures provided for in the EMPr/closure plan;

5.1.5 if applicable, specify that the corrective action/s taken for the previous audit's non-conformities, was adequate;

5.1.6 Specify the name of the auditor and

5.1.7 Be submitted by the holder to the competent authority within 30 days from the date on which the auditor finalised the audit.

5.2 Should any shortcomings in terms of Regulation 34(4) be identified, the holder must submit recommendation to amend the EMPr/closure plan in order to rectify any shortcomings identified with the aforementioned audit report.

5.3 Any complaint received from the I&AP during all phases of the operation must be attended to as soon as possible and addressed to the satisfaction of all concerned interested and affected parties.

5.4 The holder of the amended EA must annually assess the environmental liabilities of the operation by using the master rates in line with the applicable Consumer Price Index (CPI) at the time and address the shortfall on the financial provision submitted in terms of section 24P of NEMA.

5.5 The holder of the amended EA must, within 24 hours of incidents occurring, notify the Competent Authority of the occurrence or detection of any incident on the site, or incidental to the operation of the site, which has the potential to cause, or has caused pollution of the environment, health risks, nuisance conditions or water pollution.

5.6 The holder of the amended EA must, within 14 days, or a shorter period of time, if specified by the Competent Authority from the occurrence or detection of any incident referred to in condition 5.5, submit an action plan, which must include a detailed time schedule, and resource allocation signed off by top management, to the satisfaction of the Competent Authority of measures taken to –

5.6.1.1Correct the impact resulting from the incident;

5.6.1.2Prevent the incident from causing any further impact; and

5.6.1.3Prevent a recurrence of a similar incident.

5.7 In the event that measures have not been implemented within 21 days of the incident referred to in condition 5.6, or measures which have been implemented are inadequate, the Competent Authority may implement the necessary measures at the cost of the holder of the amended EA.

6. SITE SECURITY AND ACCESS CONTROL

6.1 The holder of the amended EA must ensure effective access control on the site to reasonably prevent unauthorised entry. Signs indicating the risks involved in unauthorised entry must be displayed at each entrance.

6.2 Weather proof, durable and legible notices in at least three official languages applicable in the area must be displayed at each entrance to the Site. These notices must prohibit unauthorised entry and state the hours of operation, the name, address and telephone number of the holder of the amended EA and the person responsible for the operation of the site.

7. EMERGENCY PREPAREDNESS PLAN

7.1 The holder of the amended EA must maintain and implement an emergency preparedness plan and review it biennially when conducting audit and after each emergency and or major accident. The plan must, amongst others, include:

7.1.1 Site Fire
7.1.3 Spillage
7.1.3 Natural disasters such as floods
7.14 Industrial action
7.1.5 Contact details of police, ambulances and any emergency centre closer to the site.

7.2 The holder of amended EA must ensure that an up to date emergency register is kept during all phases of the operation. This register must be made available upon request by the department.

8. INVESTIGATIONS

8.1 If, in the opinion of the Competent Authority, nuisances or health risks may be or is occurring on the site, the holder of the amended EA must initiate an investigation into the cause of the problem or suspected problem.

8.2 If, in the opinion of the Competent Authority, pollution may be or is occurring, the holder of the EA must initiate an investigation into the cause of the problem or suspected problem. Such investigation must include the monitoring of the water quality variables, at those monitoring points and such frequency as may be specified by the Competent Authority.

8.3 Investigations carried out in terms of conditions 8.1 and 8.2 above must include the monitoring of the relevant environmental pollution, nuisance and health risk variables, at those monitoring points and such frequency to be determined in consultation with the Competent Authority.

8.4. Should the investigation carried out as per conditions 8.1 and 8.2 above reveal any unacceptable levels of pollution, the holder of the amended EA must submit mitigation measures to the satisfaction of the Competent Authority.

9. COMMISSIONING AND DECOMMISSIONING

9.1 The commissioning and decommissioning of individual activity within the overall listed prospecting activity must take place within the phases and timeframes as set out in EMPr.

10. SITE CLOSURE

10.1 The holder of the amended EA must apply for a closure certificate in terms of Section 43 of Mineral and Petroleum Resources Development Act (Act 28 of 2002), as amended within 180 days of occurrence of lapsing, abandonment, cancellation, cessation, relinquishment and completion of development.

10.2 The application for closure indicated above must be submitted together with all relevant documents as indicated in Section 43 of Mineral and Petroleum Resources Development Act (Act 28 of 2002), as amended.

10.3 No exotic plants may be used for rehabilitation purposes only indigenous plant can be utilized for rehabilitation purposes.

10.4 The holder of the amended EA remains responsible for any environmental liability, pollution or ecological degradation, the pumping and treatment of extraneous water, compliance with the conditions of amended EA and the management and sustainable closure thereof until the Minister has issued a Closure Certificate in terms of Section 43 of Mineral and Petroleum Resources Development Act (Act 28 of 2002). Where necessary the Minister may retain certain portion of financial provision for residual, health or environmental impacts that might be known in future.

11. NEMA PRINCIPLES

The NEMA Principles (set out in Section 2 of NEMA, which apply to the actions of all Organs of State, serve as guidelines by reference to which any Organ of State must exercise any function when taking any decision, and which must guide the interpretation,

administration and implementation of any other law concerned with the protection or management of the environment), *inter alia*, provides for:

- the effects of decisions on all aspects of the environment to be taken into account;
- the consideration, assessment and evaluation of the social, economic and environmental impacts of activities (disadvantages and benefits), and for decisions to be appropriate in the light of such consideration and assessment;
- the co-ordination and harmonisation of policies, legislation and actions relating to the environment;
- the resolving of actual or potential conflicts of interest between Organs of State through conflict resolution procedures; and
- the selection of the best practicable environmental option.

12. DISCLAIMER

The Department of Mineral Resources in terms of the conditions of this amended environmental authorisation shall not be responsible for any damages or losses suffered by the holder, developer or his/her successor in any instance where construction or operation subsequent to construction is temporarily or permanently stopped for reasons of non-compliance with the conditions as set out herein or any other subsequent document or legal action emanating from this decision.

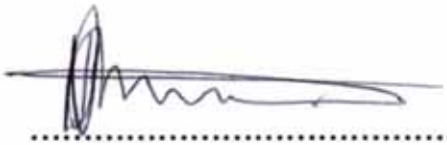
13. RECOMMENDATIONS

In view of the above, the NEMA principles, compliance with the conditions stipulated in this amended EA, and compliance with the EMPr/closure plan, the competent authority is satisfied that the proposed listed activity/ies will not conflict with the general objectives of Integrated Environmental Management stipulated in Chapter 5 of NEMA, and that any

potentially detrimental environmental impacts resulting from the listed activity/ies can be mitigated to acceptable levels. The authorisation is accordingly granted.

Your interest in the future of our environment is appreciated.

Kind Regards



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REGIONAL MANAGER: MINERAL REGULATION

FREE STATE REGIONAL OFFICE

DATE.....20/12/2016.....

mineral resources
Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

Private Bag X33, Welkom, 9460, Tel: (057) 391 1348, Fax: (057) 352 2270
Cnr State Way & Bok Street. The Strip Building, Third Floor, Welkom, 9460

Enquiries: Pule Nyaqcela **Ref:** Post book 63/22016
Sub-directorate: Mine Health and Safety

The Mine Manager
Copper Sunset Sand mine
P O Box 413712
Craighall
2024

EXEMPTION FROM THE REQUIREMENTS OF REGULATIONS 17.6 (a) IN FORCE IN TERMS OF THE MINE HEALTH AND SAFETY ACT, 1996 (ACT 29 OF 1996): MINING 100M FROM STRUCTURES.

In reply to your letter of application with regard to Regulation 17.6 (a) the following has been noted

1. A Risk Assessment was conducted on mining near the structures as required.
2. The presentation was made to the Principal Inspector of Mines. It is found to be adequate.
3. The Permissions from other Stakeholders, Eskom and Water affairs have been noted, including permission to mine under the pylons.
4. The Risk Assessment is must be continuous as conditions change and measures instituted
5. There is no blasting activities taking place, sand is removed by machinery, often not more than 2m deep.

Permission is therefore granted as per the attached schedule and as per the Risk Assessment presented to this Department. **This exemption is valid for the current concession and piece of Mining Right and Permit. Should another right be issued, a new application for exemption is necessary. All employees and Unions concerned must be made fully conversant with the terms of this exemption, copies of which must be readily available to them. The neighbouring mine New Vaal must be notified of this exemption. At any point if through noise or dust the neighbours complain, the exemption will be reviewed.**

In Health and Safety

NYAQCELA

PH NYAQCELA
PRINCIPAL INSPECTOR OF MINES
FREE STATE REGION
56/2017

02 | 10 | 2017

Copper Sunset Sand (Pty) Ltd

Department of Minerals and Energy
Private Bag X33
WELCOME
2460

12th September 2017

Attn: Mr Pule Nyaqcela
Principal Inspector of Mines

Re: Copper Sunset Sand Pty Limited
Exemption from the requirements of regulations 17.6
Mining 100 metre from structures

The mining right was confirmed to mine sand on the farm Rietfontein and Bankfontein in extent of 19.936 hectare. Further the amended environmental authorisation was confirmed.

We would like to apply for the 100 metre restriction to be amended as detailed on attached survey system.

1. 40 metres from the tar road R716
2. 17 metres from private tar road leading to New Val Colliery
3. 22 metres from Eskom structures as confirmed by Eskom (letter attached)
4. 16 metres from private road leading to New Val training centre
5. 50 metres from the 5 houses of the training centre located next to the mining operation
6. 5 metres from unused private tar road leading to the stock yard area
7. 22 metres from Eskom private railway line (being only used for the importation of lime)

We totally comply with the health and safety standards as set out by law in the mineral and health safety act.

Risk assessments and operating procedures are in place and are closely monitored.

We only operate during daylight hours from 6.00 am to 5.00 pm under full supervision.

Kindly consider our application favourably to enable us to extend our mining operation to continue the employment of our staff. We would also like to thank you sincerely for your consideration on this application.

Kind Regards

Gerd Kappler
Director

43 Tudor Park, 61 Hillcrest Avenue, Randburg, P O Box 413712 Craighall 2024
Head Office: Tel: (011) 787-9274, Fax: (011) 3264647, Site: Tel: (016) 457 2091, Fax: (016) 457 2090
E-mail: coppersunset@mweb.co.za
Directors: R E Wolter, G Kappler, H Msimang, T Vosloo
VAT No: 4910247099 Registration No. 2006/036057/07

Gmail Copper Site <coppersunsetsite@gmail.com>

Fw: ESKOM Contact.

rudiw@mweb.co.za <rudiw@mweb.co.za> Thu, Sep 7, 2017 at 8:51 AM
To: Copper Sunset Site <coppersunsetsite@gmail.com>

Hi Gerd , good news !
Rudi .

From: Chris Van Eeden
Sent: Wednesday, September 6, 2017 10:12 AM
To: rudiw@mweb.co.za
Cc: Dennis Ward
Subject: RE: ESKOM Contact.

Morning Rudi,

Permission granted with the following prerequisite.

- Stay clear, 22 meter from the outer phase of the 88kV overhead feeder.

Regards

Chris van Eeden

0832365409

From: Dennis Ward
Sent: 24 August 2017 11:51 AM
To: Chris Van Eeden
Subject: FW: ESKOM Contact.

Hi Chris,

Can you please help with this one?

Regards

Dennis

mineral resources
Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

DMR 10

Private Bag X 33, Welkom,9460, Tel: (057) 391 1300, Fax: (057) 357 6003
314 Stateway, the Strip Building, Second Floor, Welkom 9459
Enquiries: N.V ZINDELA Ref: FS30/5/1/2/2/164 MR

REGISTERED MAIL

The Director/s
Copper Sunsent Sand (Pty) Ltd
61 Hillcrest Avenue
P.O Box 413712
Craighall
2024

FAX No: 011 326 4647

Attention: R.E Wolter

APPLICATION FOR AMENMENT IN TERMS IN TERMS OF SECTION 102 OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002(ACT 28 OF 2002) (HEREINAFTER REFERRED TO AS "THE ACT"): TO MINING RIGHT FOR SAND (GENERAL) IN RESPECT OF THE REMAINDER OF THE FARM BANKFONTEIN 9, PORTION OF PORTION 9 OF THE FARM BANKFONTEIN 9 AND PORTION OF THE FARM ZANDFONTEIN 259, ALL SITUATED IN THE MAGISTERAIL DISTRICT OF SASOLBURG HELD BY COPPER SUNSET SAND (PTY) LTD.

APPLICATION FOR AMENDMENT IN TERMS OF SECTION 102 OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (ACT 28 OF 2002) (AS AMENDED) (HEREINAFTER REFERRED TO AS MPRDA): LODGED BY COPPER SUNSET SAND (PTY) LTD, RESPECT OF THE REMAINDER OF THE FARM BANKFONTEIN 9, PORTION OF PORTION 9 OF THE FARM BANKFONTEIN 9 AND PORTION OF THE FARM ZANDFONTEIN NO: 259, BY INCLUDING PORTION OF THE FARM RIETFONTEIN 152, ALL SITUATED IN THE MAGISTERIAL DISTRICT OF SASOLBURG. (FS 30/5/1/2/2/164 MR) –

mineral resources
Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

Private Bag X33, Welkom, 9460, Tel: 057 391 1356, Fax: 057 357 6003
The Strip Building, 314 Stateway Street, Welkom, 9459

Enquiries: Ms A Nemulodi Ref: FS 30/5/1/2/3/2/1 (164) EM
E-Mail Address: azwihangwisi.nemulodi@dmr.gov.za
Sub-Directorate: Mine Environmental Management

BY HAND

The Directors
Copper Sunset Sands (Pty) Ltd
P.O. Box 413712
Craighall
Johannesburg
2024

Attention: Mr. R. Wolter

Fax no: 011 326 4647

AMENDED ENVIRONMENTAL AUTHORISATION IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (NEMA) AS AMENDED, AND THE ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REGULATIONS, 2014 FOR MINING SAND (GENERAL) ON THE REMAINDER OF THE FARM BANKFONTEIN 9, A PORTION OF THE FARM ZANDFONTEIN 259 AND A PORTION OF THE FARM RIETFONTEIN 152 WITHIN SASOLBURG LOCAL MUNICIPALITY OF THE FREE STATE REGION.

With reference to the abovementioned application, please be advised that the Department has decided to **grant** an amended environmental authorisation in terms of the National Environmental Management Act (Act 107 of 1998). The amended environmental authorisation and reasons for the decision are attached herewith.

In terms of regulation 4 (2) of the Environmental Impact Assessment Regulations of 2014, you are instructed to notify all registered interested and affected parties, in writing within 14 (Fourteen) calendar days, from the date of the Department's decision in respect of your application and the relevant provisions regarding the lodgement of an appeal must be provided for in terms of the National Appeal Regulations of 2014.

Should you wish to appeal any aspect of the decision, you must submit the appeal to the Minister of Environmental Affairs and a copy of such appeal to the Department of Mineral Resources (Free State Regional Office), within 20 days from the date of notification. and such appeal must be lodged as prescribed in by Chapter 2 of the

mineral resources
Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

Private Bag X33, Welkom, 9460, Tel: 057 391 1356, Fax: 057 357 6003
The Strip Building, 314 Stateway Street, Welkom, 9459

Enquiries: Ms A Nemulodi Ref: FS 30/5/1/2/3/2/1 (164) EM
E-Mail Address: Azwihangwisi.Nemulodi@dmr.gov.za
Sub-Directorate: Mine Environmental Management

BY REGISTERED MAIL

The Directors
Copper Sunset Sand (Pty) Ltd
P.O. Box 413712
Craighall
2024

Attention: Mr. R Wolters

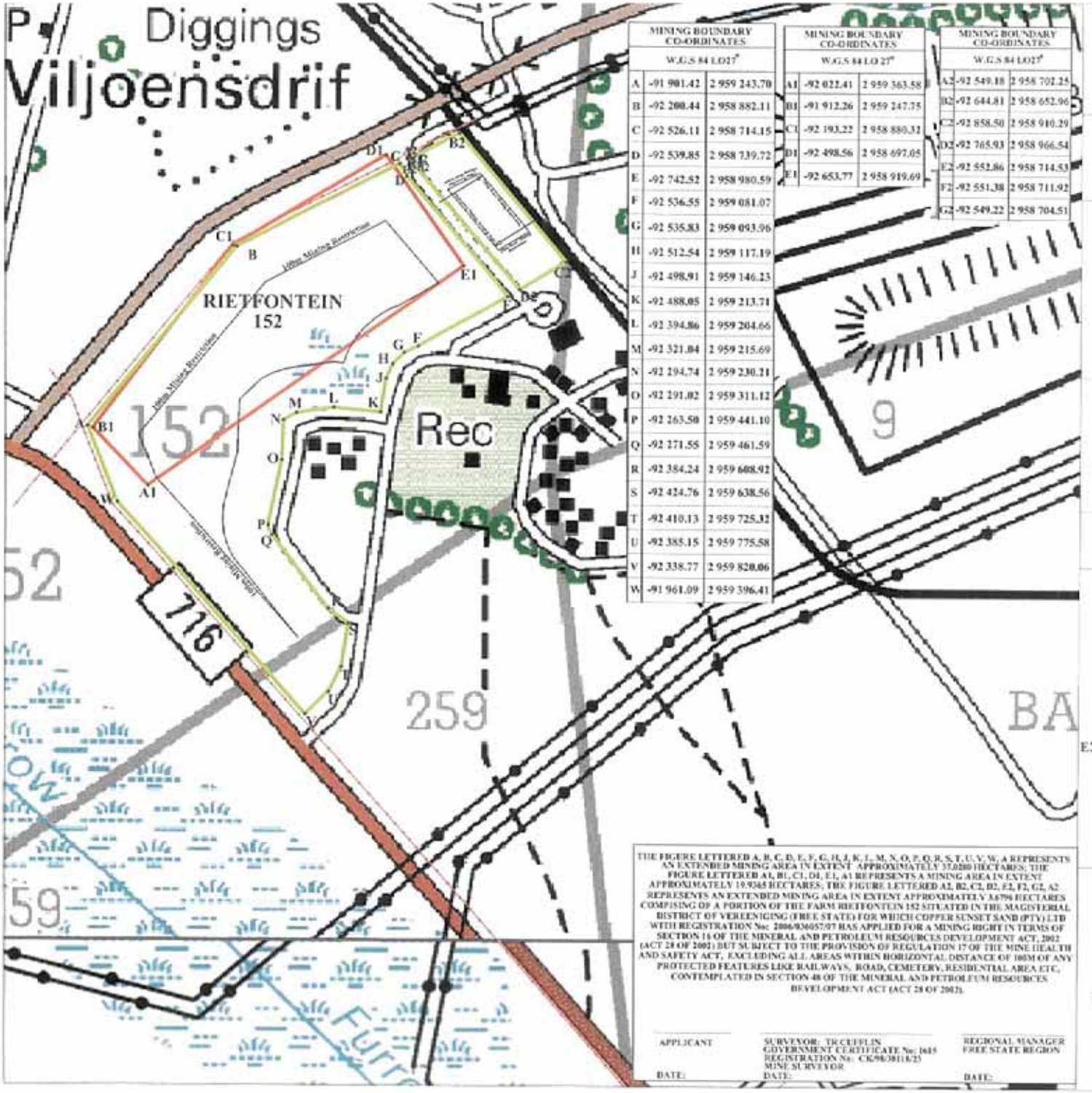
Fax no: 011 787.9274

ENVIRONMENTAL AUTHORISATION IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (NEMA) AS AMENDED, AND THE ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REGULATIONS, 2014 FOR MINING SAND (GENERAL) ON THE REMAINDER OF THE FARM BANKFONTEIN 9 AND A PORTION OF THE FARM ZANDFONTEIN 259, SITUATED WITHIN THE MAGISTERIAL DISTRICT OF SASOLBURG IN THE FREE STATE PROVINCE.

With reference to the abovementioned application, please be advised that the Department has decided to **grant** environmental authorisation in terms of the National Environmental Management Act, 1998 (Act 107 of 1998). The environmental authorisation and reasons for the decision are attached herewith.

In terms of regulation 4(2) of the Environmental Impact Assessment Regulations of 2014, you are instructed to notify all registered interested and affected parties, in writing within 14 (Fourteen) calendar days, from the date of the Department's decision in respect of your application and the relevant provisions regarding the lodgement of an appeal must be provided for in terms of the National Appeal Regulations of 2014.

Should you wish to appeal any aspect of the decision, you must submit the appeal to the Minister of Environmental Affairs and a copy of such appeal to the Department of Mineral Resources (Free State Regional Office), within 20 days from the date of notification, and such appeal must be lodged as prescribed in by chapter 2 of the National Appeal Regulations of 2014, by means of the methods as per prescribed below:



MINING BOUNDARY CO-ORDINATES W.G.S 84 LO27°		
A	-91 981.42	2 959 243.70
B	-92 200.44	2 958 882.11
C	-92 526.11	2 958 714.15
D	-92 539.85	2 958 739.72
E	-92 742.52	2 958 980.59
F	-92 536.55	2 959 081.07
G	-92 535.83	2 959 093.96
H	-92 512.54	2 959 117.19
J	-92 498.91	2 959 146.23
K	-92 488.05	2 959 213.71
L	-92 394.86	2 959 204.66
M	-92 321.84	2 959 215.69
N	-92 294.74	2 959 230.21
O	-92 291.82	2 959 311.12
P	-92 263.58	2 959 441.10
Q	-92 271.55	2 959 461.59
R	-92 384.24	2 959 608.92
S	-92 424.76	2 959 638.56
T	-92 410.13	2 959 725.32
U	-92 385.15	2 959 775.58
V	-92 338.77	2 959 820.06
W	-91 961.09	2 959 396.41

MINING BOUNDARY CO-ORDINATES W.G.S 84 LO27°		
A1	-92 022.41	2 959 363.58
B1	-91 912.26	2 959 247.75
C1	-92 193.22	2 958 880.32
D1	-92 498.56	2 958 697.05
E1	-92 653.77	2 958 919.69

MINING BOUNDARY CO-ORDINATES W.G.S 84 LO27°		
A2	-92 549.18	2 958 702.25
B2	-92 644.81	2 958 652.96
C2	-92 858.50	2 958 910.29
D2	-92 765.93	2 958 966.54
E2	-92 552.86	2 958 714.53
F2	-92 551.38	2 958 711.92
G2	-92 549.22	2 958 704.51

THE FIGURE LETTERED A, B, C, D, E, F, G, H, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, A REPRESENTS AN EXTENDED MINING AREA IN EXTENT APPROXIMATELY 35.0280 HECTARES; THE FIGURE LETTERED A1, B1, C1, D1, E1, A1 REPRESENTS A MINING AREA IN EXTENT APPROXIMATELY 19.9365 HECTARES; THE FIGURE LETTERED A2, B2, C2, D2, E2, F2, G2, A2 REPRESENTS AN EXTENDED MINING AREA IN EXTENT APPROXIMATELY 3.6796 HECTARES COMPRISING OF A PORTION OF THE FARM RIETFONTEIN 152 SITUATED IN THE MAGISTERIAL DISTRICT OF VEREENIGING (FREE STATE) FOR WHICH COPPER SUNSET SAND (PTY) LTD WITH REGISTRATION No: 2006/036057/07 HAS APPLIED FOR A MINING RIGHT IN TERMS OF SECTION 16 OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (ACT 28 OF 2002) BUT SUBJECT TO THE PROVISION OF REGULATION 17 OF THE MINE HEALTH AND SAFETY ACT, EXCLUDING ALL AREAS WITHIN HORIZONTAL DISTANCE OF 100M OF ANY PROTECTED FEATURES LIKE RAILWAYS, ROAD, CEMETERY, RESIDENTIAL AREA ETC, CONTEMPLATED IN SECTION 48 OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT (ACT 28 OF 2002).

APPLICANT

DATE:

SURVEYOR: TR CUFFLIN
GOVERNMENT CERTIFICATE No: 1615
REGISTRATION No: CK/98/38118/23
MINE SURVEYOR
DATE:

REGIONAL MANAGER
FREE STATE REGION

DATE:

COPPER SUNSET SAND (PTY) LTD

2006/036057/07

APPLICATION FOR A MINING RIGHT

PLAN COMPILED IN TERMS OF REGULATION 42 OF THE MINING TITLES ACT.

SURVEY SYSTEM W.G.S 84 LO 27

NATIONAL GRID DEGREE SQUARE 2627DB AND 2627DD

SCALE 1:7 500

LEGEND

- FARM BOUNDARY
- PORTION BOUNDARY
- POWERLINES
- MINING AREA
- EXTENDED MINING AREA
- ROADS
- CONTOURS A.M.S.L. 1760
- WATER COARSES

N

DRAWN BY: TREVOR CUFFLIN SURVEYS cc
REGISTRATION No: CK/98/38118/23
TELEPHONE NUMBER: 083 263 6304
FAX NUMBER: (012) 253 1821
E-MAIL: TREVCUF@GLOBAL.CO.ZA


B.
Area - 40.43 Ha
Area - 20.44 Ha
"A"
Area - 8.74 Ha
Rehab
Rehab
Rehab
Rehab
Rehab
Anglo Residential Area

Copper Sunset Sand (Pty) Ltd

ESKOM – CONTACT

29th September 2017

ATTN: Mr Chris Van Eeden

Dear Sir

Re: ESKOM 88 KV POWER LINE

Thank you very much for visiting our mining operation again with your colleague on Monday 18th September 2017 on the farm Rietfontein and the inspection of the dual 88KV power line.

Our surveyor was only able to do a detailed survey of the powerline on the 27th of September and I will forward to you a copy of the drawing as soon as it is available, but definitely during the course of this week.

The reference during your visit was made to your email dated 6th September 2017 and it was agreed that the 22 metre clearance will apply between the power line and tar road side leading to New Val Colliery offices but on the inner side we can mine up to 5 metre of the power line but 22 metre clearance from each power line support structure.

Once again thank you very much for the modified permission and understanding.

Kind Regards

Gerd Kappler
Director

3/10/2017

43 Tudor Park, 61 Hillcrest Avenue, Randburg, P O Box 413712 Craighall 2024
Head Office: Tel: (011) 787-9274, Fax: (011) 3264647, Site: Tel: (016) 457 2091, Fax: (016) 457 2090
E-mail: coppersunset@mweb.co.za
Directors: R E Wolter, G Kappler, H Msimang, T Vosloo

VAT No: 4910247099

Registration No. 2006/036057/07

Appendix F: Details of pre-application meeting

Project Name:	Copper Sunset: Proposed Regulation 31 Amendment
Project No:	COP4899
Date:	04 October 2017

Minutes of the Pre-Application Consultative Meeting with Department of Mineral Resources for Copper Sunset: Proposed Regulation 31 Amendment

1 Attendance and Apologises

Please refer to the attached attendance register (Appendix A).

2 Agenda

- Copper Sunset Background and Mining Process;
- Approved Mining and Listed Activities;
- Proposed Extension of Mining Activities;
- Specialist Studies;
- Proposed Application Process: Regulation 31
- Public Participation Process; and
- Discussion and way forward.

3 Welcome and Introductions

Lelani Stolp (**LS**) thanked Azwihangwisi Nemulodi (**AN**) for making time to join this meeting.

A round of introductions was done

4 Copper Sunset Background and Mining Process

LS went through the background of Copper Sunset and their mining process.

AN pointed out Copper Sunsets latest amendment was in close proximity to a wetland and asked whether they have mined there.

LS indicated that they have started with discussions with the Department of Water and Sanitation (DWS) to determine the licensing requirements.

Lucy Koeslag (**LK**) indicated that approval was received from Eskom and from Mine, Health and Safety (MHS) for Copper Sunset to mine closer to the railways lines, roads and powerlines.

AN asked if MHS indicated the allowable buffer distances from different infrastructure and asked if the MHS and Eskom approved buffer zones were the same.

LK indicated that there is a buffer from MHS, and that the buffer was not contradictory.

5 Approved Mining and Listed Activities

LS presented on the approved mining and listed activities.

AN asked whether the 39 hectares is included and if so why are they including it because they already have an approval.

LS pointed on the map and showed where the previous application areas were and indicated the location of the new application area.

AN asked which areas had been approved.

LS indicated the areas which had been approved.

AN pointed out that the Regulations have been updated / amended recently had changed.

LS acknowledged the new changes to the regulation and indicated that the previous extensions (Application 1 and Application 2) were approved under the Regulations that were applicable at the time of the applications.

6 Proposed Extension of Mining Activities

LS presented on the proposed extension of mining activities. She also pointed out the Listed Activity contained in the current Environmental Authorisation.

AN commented on the fact that the mining activity is not included in the current Environmental Authorisation, and indicated that mining should have been included because this is mining related as well. The listed activity related to Mining should be included in the amendment application.

7 Specialist Studies

LS presented on the specialist studies and the planned way forward. The Heritage study will be an addendum to the previous heritage study and no further heritage assessments are thought to be necessary.

AN indicated that the Department would normally request a study, or an exception from the specialist on the study.

LS asked if there is a form that needs to be completed for this exemption.

AN indicated that there is no specific form but rather it can be sent in a form of a letter, this is used for accountability. **AN** asked if the heritage specialist did not include the whole property during the previous investigation.
LS indicated that the previous heritage studies were limited to the footprints being applied for at the time.

LS indicated that a pre-application meeting with DWS was being set up in order to understand their requirements.

LS asked **AN** if she agrees to the proposed method of doing an amendment.

AN explained that it is not about agreeing at this moment. On her side she would need to know what agreement was made during the previous application process in order to know whether the department agreed to the amendment during at the last consultation meeting.

8 Proposed Application Process: Regulation 31

LS presented on the proposed application process under Regulation 31

AN indicated the client Rudi wanted to mine in another area, so from this information the other colleagues would need to advice. **AN** added that if there is a go ahead it is important to include the 2017 amendment of the NEMA EIA Regulations and combine mining in that application, it will also be important to explain that it is an existing mine.

9 Public Participation Process

LS presented on the public participation process that will be followed.

AN asked if PPP will start again.

LS indicated that it will be a new PPP but the same database will be used just updated.

AN indicated that in the newspaper advert it should state where the meeting will be. **AN** indicated that it is important to have a public meeting.

LK pointed out that maybe the meeting can be combined when closure is being done.

AN indicated that there is no way there can be a partial closure when there is another application being done.

10 Discussion and way forward

LS opened the floor up for discussions.

AN wanted clarification on how long the mine will operate for.

LS indicated that it will be until January 2018.

AN asked what happens after closure, where will Copper Sunset go.

LK indicated that they will not do anything further thereafter.

LS asked **AN** how long she thinks it will take to get a response from the colleagues.

AN indicated that today if she can find her colleagues she will seek to get a way forward, however she still needs Rudi to tell them that this is the last amendment application.

11 Conclusion

LS thanked all attendees for making it to the meeting

DIGBY WELLS
ENVIRONMENTAL

ATTENDANCE REGISTER FOR

Copper Sunset

Proposed Regulation 31 Amendment Pre-application meeting

The Strip, 314, C/O Stateway & Bok Street, Welkom, 9459

04 October 2017

Digby Wells and Associates (South Africa) (Pty) Ltd. Co. Reg. No. 2010/008577/07. Turnberry Office Park, 48 Grosvenor Road, Bryanston, 2191. Private Bag X10046, Randburg, 2125, South Africa
Tel: +27 11 789 9495, Fax: +27 11 069 6801, info@digbywells.com, www.digbywells.com

DIGBY WELLS
ENVIRONMENTAL

DATE: 4 October 2017 **VENUE:** DMR Welkom

SUBJECT: Pre-Application Meeting Copper Sunset **PRESENTER:** Lelani Stolp

NAME AND SURNAME	DEPARTMENT	TEL / CELL	EMAIL	SIGNATURE
Azwihangwisi Nemukula	DMR	0714758373	azwihangwisi.nemukula@dmr.gov.za	
LELANI STOLP	DIGBY WELLS	0767353992	lelani.stolp@digbywells.com	
Lucy Kaesky	Digby Wells	0823321717	lucy.kaesky@digbywells.c	
Nontlumiso Gwala	D.W.E	0794580867	gwaladuni@gmail.com	

Appendix G: Wetland Delineation Report

DIGBY WELLS
ENVIRONMENTAL

Proposed Copper Sunset Sand Mining Right Extension Area

Draft Draft Wetland and Vegetation Screening Assessment

Project Number:

COP4461

Prepared for:

Copper Sunset Sand (Pty) Ltd

February 2017

Digby Wells and Associates (South Africa) (Pty) Ltd
Co. Reg. No. 2010/008577/07. Turnberry Office Park, 48 Grosvenor Road, Bryanston, 2191. Private Bag X10046, Randburg, 2125, South Africa
Tel: +27 11 789 9495, Fax: +27 11 069 6801, info@digbywells.com, www.digbywells.com

This document has been prepared by Digby Wells Environmental.

Report Type:	**Draft Wetland and Vegetation Screening Assessment**
Project Name:	**Proposed Copper Sunset Sand Mining Right Extension Area**
Project Code:	**COP4461**

Name	Responsibility	Signature	Date
Crystal Rowe	Report compiler		2017-02-08
Koos Smit	1st Review		2017-02-08

EXECUTIVE SUMMARY

Digby Wells Environmental (hereinafter Digby Wells) was appointed by Copper Sunset Sand (Pty) Ltd (hereinafter Copper Sunset) to conduct a wetland delineation and vegetation screening assessment to identify any alien plant species that require removal from the Copper Sunset sand mining extension area site near Vereeniging, in the Gauteng Province.

A site visit was conducted on the on the 12th of January 2017 and a wetland area was confirmed on site. The wetland area has formed due to artificial conditions (water input from a culvert) but wetland signature features such as hydrophilic vegetation and standing water had established. According to Section 21 of the National Water Act, 1998 (Act No. 36 of 1998) (NWA), a water use must be licensed unless it is listed in Schedule 1 as an existing lawful use; in which case a General Authorisation (GA) is applicable. The following identified water uses (as defined in the NWA) are applicable to the Copper Sunset Mining Operations (if the mining is to occur within 500 meters of the wetland identified on site):

- Impeding or diverting the flow of water in a watercourse (Section 21 (c)), and
- Altering the bed, banks, course or characteristics of a watercourse (Section 21 (i));

A total of 10 plant species were recorded in the mining extension area, although more may establish. Declared Alien Invader Plant species, as listed by the National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004): GNR 598 Alien Invasive Species Regulations (2014), identified include: *Cirsium vulgare* (Scotch Thistle) (Category 1b), *Eucalyptus cinerea* (Silver Dollar *Eucalyptus*), two Poplar species (Category 2 – *Populus alba* and *P x canescens*) in the channel of the wetland, as well as a stand of *Pinus patula* (Cluster Pine) (Category 2) .

Areas that have been rehabilitated have been colonised primarily by alien plant species; the majority of which do not hold any problem plant species status and which are not listed by Alien Invasive Species Regulations (NEMBA, 2004: GNR 598). It is advisable, however, that all areas that have been rehabilitated are burnt under a controlled fire regime and re-seeded with native grassland species. Species such as *Cynodon dactylon* (Couh Grass), *Digitaria eriantha* (Digit Grass) and *Chloris gayana* (Rhodes Grass) should be included in the seed-mix. *C. dactylon* in particular has excellent soil-holding capacity and can spread quite rapidly, reducing the risk of erosion.

All alien plant species identified on site should be removed manually and the area should be monitored for alien plant species emergence. Upon emergence, all alien plants should be manually removed. Individuals should not be allowed to reach seed-bearing or flowering maturity to prevent further spread. Alien plant monitoring should take place for a period of 2-3 years after rehabilitation and re-seeding have taken place.

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1 Introduction

Wetlands are sensitive ecosystems that perform many complex functions including the maintenance of water quality, toxicant assimilation, carbon storage, streamflow regulation, flood attenuation, various social benefits as well as the maintenance of biodiversity (Kotze *et al*., 2007). The Ramsar Convention on Wetlands refers to wetlands as one of the most important life support systems on earth owing to the services provided.

Wetlands are defined according to the National Water Act, 1998(Act No. 36 of 1998) (NWA) as: "land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil." Furthermore, a water resource is considered to be the entire water cycle, not only the water that can be taken from a system and utilised. This is significant as it includes physical processes such as evaporation and precipitation as well as the aquatic ecosystems containing the structural aquatic habitats, the biota, and the physical, chemical and ecological processes that link all of these.

Further to this, wetlands are important for the maintenance of biodiversity. Biodiversity is a vital component for maintaining ecological processes and thus in ensuring sustainability of the ecosystem goods and services which is vital for successful water resource management (MacKay *et al*., 2004). This report identifies and describes wetlands and vegetation associated with the Copper Sunset (Pty) Ltd (hereinafter Copper Sunset) sand mining operation near Viljoensdrif in the Gauteng Province.

2 Terms of Reference

According to Section 21 of the National Water Act, 1998 (Act No. 36 of 1998) (NWA), a water use must be licensed unless it is listed in Schedule 1 as an existing lawful use; in which case a General Authorisation (GA) is applicable. The following identified water uses (as defined in the NWA) may be applicable to the Copper Sunset Mining Operations (if the mining is to occur within 500 meters of a wetland):

- Impeding or diverting the flow of water in a watercourse (Section 21 (c)), and
- Altering the bed, banks, course or characteristics of a watercourse (Section 21 (i));

Further to the above, a specialist vegetation assessment has been conducted on the Application Area to verify whether any rare or protected species are present which may warrant protection or further environmental licensing to remove them.

Government Notice 509 was published in Gazette 40229 dated 26 August 2016. This Notice sets out new protocols for the use of water as contemplated in Sections 21(c) and 21(i) of the NWA. GN R509 provides that the purpose of the GA is to replace the need for a water user to apply for a licence in terms of the NWA, for authorising the impeding or diverting the flow of water in a watercourse, or altering the bed, banks, course or characteristics of a watercourse, provided that the water use is within the limits and conditions of the GA.

The GA provides that calculation of Risk may only be undertaken by a registered member of the South African Council for Natural Scientific Professions, and that Low Risk activities located within the regulated area of the watercourse will qualify for a GA. Medium and High Risk activities will require a Section 21 (c) and (i) water use licence.

The following deliverables were included as part of the Wetland Delineation and Vegetation Assessment:

- Identification of plant species of special concern;
- Identification of alien plant species;
- General comments on the success of rehabilitation undertaken at the Copper Sunset Mining Operations; and
- Geographic Information System (GIS) Maps and Plans indicating the site boundary, the extent of wetlands and the location of sensitive vegetation.

3 Details of Specialists

Crystal Rowe specialises in flora and wetland ecology and was the wetland specialist lead for this project. She achieved a BSc in Botany and Geology and a BSc Hons in Botany at Nelson Mandela Metropolitan University (NMMU). Key experience includes ecological impact assessments, baseline vegetation assessments, estuarine ecological state assessments and wetland health assessments. Project experience includes various countries such as: the DRC, Ethiopia, the Ivory Coast, Mali, Mozambique, Sierra Leone, and Senegal and extensively within South Africa. Crystal is competent in plant identification and is experienced in IFC compliant assessments. She is also certified to complete wetland Ecosystem Services and is a registered professional natural scientist in South Africa (Reg. No. 400090/15).

Stephanie Mulder is Unit Manager of the GIS Unit at Digby Wells. She obtained a BSc Geography and Informatics with Financial Orientation degree and a BSc (Hons) degree in Geography from the University of Johannesburg. Stephanie joined Digby Wells as a GIS Specialist in September 2009 and became Unit Manager of the GIS Unit in July 2012. She is responsible for managing the GIS staff and overseeing all GIS work. Stephanie has experience writing Topography and Visual Impact Assessment (T&VIA) specialist reports. She has experience managing GIS specific projects and has also managed several social survey projects. Stephanie has a strong technical GIS background and has experience using GIS as a digital cartographic and spatial analytical tool. She also has experience with interactive mapping, remote sensing, sensitivity analysis and site selection projects.

4 Methodology

4.1 Wetland Assessment

A site visit was conducted on the 12th of January 2017 for one day to the areas in question. This section describes the methodology employed for the site visit and data processing.

4.1.1 Wetland Delineation

In accordance with the DWAF guidelines (DWAF 2005) the wetland delineation procedure considers four attributes to determine the limitations of the wetland. The four attributes are:

- Terrain Unit Indicator – helps to identify those parts of the landscape where wetlands are more likely to occur;
- Soil Form Indicator – identifies the soil forms, which are associated with prolonged and frequent saturation;
- Soil Wetness Indicator – identifies the morphological "signatures" developed in the soil profile as a result of prolonged and frequent saturation; and
- Vegetation Indicator – identifies hydrophilic vegetation associated with frequently saturated soils.

In accordance with the definition of a wetland in the NWA, 1998, vegetation is the primary indicator of a wetland, which must be present under normal circumstances; however, the soil wetness indicator tends to be the most important in practice. The remaining three indicators are then used in a confirmatory role. The reason for this, is that the response of vegetation to changes in the soil moisture regime or management are relatively quick and may be transformed, whereas the morphological indicators in the soil are significantly more permanent and will hold the indications of frequent and prolonged saturation long after a wetland has been drained (perhaps several centuries) (DWAF 2005). The wetland associated with the sand mining extension area was delineated in the field.

4.1.1.1 Terrain Indicator

Terrain Unit Indicator (TUI) areas include depressions and channels where water would be most likely to accumulate. These areas are determined with the aid of topographical maps, aerial photographs and engineering and town planning diagrams (DWAF, 2005). The Hydr-geomorphic Unit (HGM Unit) system of classification focuses on the hydro-geomorphic setting of wetlands which incorporates geomorphology; water movement into, through and out of the wetland; and landscape/topographic setting. Once wetlands have been identified, they are categorised into HGM Units as shown in Table 4.1 1. HGM Units are then assessed individually for the calculation of the Present Ecological State (PES) and ecological services.

Table 4-1: Description of the difference Hydro-geomorphic Units for Wetland Classification

Floodplain		Valley bottom areas with a well-defined stream channel stream channel, gently sloped and characterised by floodplain features such as oxbow depression and natural levees and the alluvial (by water) transport and deposition of sediment , usually leading to a net accumulation of sediment. Water inputs from main channel (when channel banks overspill) and from adjacent slopes.
Valley bottom with a channel		Valley bottom areas with a well-defined stream channel but lacking characteristic floodplain features. May be gently sloped and characterized by the net accumulation of alluvial deposits or may have steeper slopes and be characterised by the net loss of sediment. Water inputs from the main channel (when channel banks overspill) and from adjacent slopes.
Valley bottom without a channel		Valley bottom areas with no clearly defined stream channel, usually gently sloped and characterised by alluvial sediment deposition, generally leading to a net accumulation of sediment. Water inputs mainly from the channel entering the wetland and also from adjacent slopes.
Hillslope seepage linked to a stream channel		Slopes on hillsides, which are characterised by colluvial (transported by gravity) movement of materials. Water inputs are mainly from sub-surface flow and outflow is usually via a well-defined stream channel connecting the area directly to a stream channel.
Isolated hillslope seepage		Slopes on hillsides that are characterised by colluvial transport (transported by gravity) movement of materials. Water inputs are from sub-surface flow and outflow either very limited or through diffuse sub-surface flow but with no direct link to a surface water channel.
Pan/Depression		A basin-shaped area with a closed elevation contour that allows for the accumulation of surface water (ie. It is inward draining). It may also receive subsurface water. An outlet is usually absent and so this type of wetland is usually isolated from the stream network.

4.1.1.2 Soil Form Indicator

Hydromorphic soils are taken into account for the Soil Form Indicator (SFI) which will display unique characteristics resulting from prolonged and repeated water saturation (DWAF, 2005). The continued saturation of the soils results in the soils becoming anaerobic and thus resulting in a change of the chemical characteristics of the soil. Iron and manganese are two soil components which are insoluble under aerobic conditions and become soluble when the soil becomes anaerobic and thus begin to leach out into the soil profile. Iron is one of the most abundant elements in soils and is responsible for the red and brown colours of many soils. Resulting from the prolonged anaerobic conditions, iron is dissolved out of the soil, and the soil matrix is left a greying, greenish or bluish colour, and is said to be “gleyed”. Common in wetlands which are seasonally or temporarily saturated is a fluctuating water table, these results in alternation between aerobic and anaerobic conditions in the soil (DWAF, 2005). Iron will return to an insoluble state in aerobic conditions which will result in deposits in the form of patches or mottles within the soil. Recurrence of this cycle of wetting and drying over many decades concentrates these insoluble iron compounds. Thus, soil that is gleyed and has many mottles may be interpreted as indicating a zone that is seasonally of temporarily saturated (DWAF, 2005).

4.1.1.3 Soil Wetness Indicator

In practice, the Soil Wetness Indictor (SWI) is used as the primary indicator (DWAF, 2005). Hydromorphic soils are often identified by the colours of various soil components. The frequency and duration of the soil saturation periods strongly influences the colours of these components. Grey colours become more prominent in the soil matrix the higher the duration and frequency of saturation in a soil profile (DWAF, 2005). A feature of hydromorphic soils are coloured mottles which are usually absent in permanently saturated soils and are most prominent in seasonally saturated soils, and are less abundant in temporarily saturated soils (DWAF, 2005). In order for a soil horizon to qualify as having signs of wetness in the temporary, seasonal or permanent zones, a grey soil matrix and/or mottles must be present. This is however difficult in vertic black soil with very high clay content.

4.1.1.4 Vegetation Indicator

If vegetation was to be used as a primary indicator, undisturbed conditions and expert knowledge are required (DWAF, 2005). Due to this uncertainty, greater emphasis is often placed on the SWI to delineated wetland areas. In this assessment the SWI has been relied upon to delineated wetland areas in addition, the identification of indicator vegetation species and the use of plant community structures has been used to validate these boundaries. As one moves along the wetness gradient from the centre of the wetland to the edge, and into adjacent terrestrial areas plant communities undergo distinct changes in species composition. Valuable information for determining the wetland boundary and wetness zone is derived from the change in species composition.

A supplementary method for employing vegetation as an indicator is to use the broad classification of the wetland plants according to their occurrence in the wetlands and

wetness zones (Kotze and Marneweck, 1999; DWAF, 2005). This is summarised in Table 4-2 below. When using vegetation indicators for delineation, emphasis is placed on the group of species that dominate the plant community, rather than on individual indicator species (DWAF, 2005). Areas where soils are a poor indicator (black clay, vertic soils), vegetation (as well as topographical setting) is relied on to a greater extent and the use of the wetland species classification becomes more important.

Table 4-2: Classification of Plant Species according to occurrence in Wetlands (DWAF, 2005)

Type	Description
Obligate Wetland species (OW)	Almost always grow in wetlands: >99% of occurrences.
Facultative Wetland species (FW)	Usually grow in wetlands but occasionally are found in non-wetland areas: 67 – 99 % of occurrences.
Facultative species (F)	Are equally likely to grow in wetlands and non-wetland areas: 34 – 66% of occurrences.
Facultative dry-land species (fd)	Usually grow in non-wetland areas but sometimes grow in wetlands: 1 – 34% of occurrences.

4.1.2 Wetland Ecological Health Assessment

According to Macfarlane *et al.* (2009) the health of a wetland can be defined as a measure of the deviation of wetland structure and function from the wetland's natural reference condition. A WET-Health assessment was done on the wetlands in accordance with the method described by Kotze *et al.* (2007) to determine the integrity (health) of the characterised HGM units for the project area.

4.1.2.1 Present Ecological State (PES)

A PES analysis was conducted to establish baseline integrity (health) for the associated wetlands. In order to determine the integrity (health) of the characterized HGM units for the project area, the WET-Health tool was applied. According to Macfarlane *et al*. (2007) the health of a wetland can be defined as a measure of the deviation of wetland structure and function from the wetland's natural reference condition. The health assessment attempts to evaluate the hydrological, geomorphological and vegetation health in three separate modules in order to attempt to estimate similarity to or deviation from natural conditions. The Present Ecological State (PES) is determined according to Table 4-3.

Table 4-3: Impact scores and Present Ecological State categories used by WET-Health (Kotze *et al*., 2007)

Description	Combined Impact Score	PES Category
Unmodified, natural.	0-0.9	A
Largely natural with few modifications. A slight change in ecosystem processes is discernible and a small loss of natural habitats and biota has taken place.	1-1.9	B
Moderately modified. A moderate change in ecosystem processes and loss of natural habitats has taken place but the natural habitat remains predominantly intact.	2-3.9	C
Largely modified. A large change in ecosystem processes and loss of natural habitat and biota has occurred.	4-5.9	D
The change in ecosystem processes and loss of natural habitat and biota is great but some remaining natural habitat features are still recognisable.	6-7.9	E
Modifications have reached a critical level and ecosystem processes have been modified completely with an almost complete loss of natural habitat and biota.	8-10	F

4.1.2.2 Ecological Importance and Sensitivity (EIS)

The EIS tool was derived to assess the system's ability to resist disturbance and its capability to recover from disturbance once it has occurred. The purpose of assessing importance and sensitivity of water resources is to be able to identify those systems that provide higher than average ecosystem services, biodiversity support functions or are especially sensitive to impacts. Water resources with higher ecological importance may require managing such water resources in a better condition than the present to ensure the continued provision of ecosystem benefits in the long term. The methodology outlined by DWAF (1999) and updated in Rountree and Kotze, (2012), in Rountree *et al.* (2012) was used for this study. For this method there are three suites of importance criteria; namely:

- Ecological Importance and Sensitivity: incorporating the traditionally examined criteria used in EIS assessments of other water resources by DWS and thus enabling consistent assessment approaches across water resource types;
- Hydro-functional Importance: which considers water quality, flood attenuation and sediment trapping ecosystem services that the wetland may provide; and
- Importance in terms of Basic Human Benefits: this suite of criteria considers the subsistence uses and cultural benefits of the wetland system.

These determinants are assessed for the wetlands on a scale of 0 to 4, where 0 indicates no importance and 4 indicates very high importance. It is recommended that the highest of these three suites of scores be used to determine the overall Importance and Sensitivity category of the wetland system, as defined in Table 4-4

Table 4-4: Interpretation of Overall EIS Scores for Biotic and Habitat Determinants (Rountree & Kotze, 2012)

Ecological Importance and Sensitivity Category (EIS)	Range of Scores
Very high	>3 and <=4
Wetlands that are considered ecologically important and sensitive on a national or even international level. The biodiversity of these systems is usually very sensitive to flow and habitat modifications. They play a major role in moderating the quantity and quality of water of major rivers.	
High	>2 and <=3
Wetlands that are considered to be ecologically important and sensitive. The biodiversity of these systems may be sensitive to flow and habitat modifications. They play a role in moderating the quantity and quality of water of major rivers.	
Moderate	>1 and <=2
Wetlands that are considered to be ecologically important and sensitive on a provincial or local scale. The biodiversity of these systems is not usually sensitive to flow and habitat modifications. They play a small role in moderating the quantity and quality of water of major rivers.	
Low/marginal	>0 and <=1
Wetlands that are not ecologically important and sensitive at any scale. The biodiversity of these systems is ubiquitous and not sensitive to flow and habitat modifications. They play an insignificant role in moderating the quantity and quality of water of major rivers.	

4.2 Vegetation Assessment

4.2.1 Expected Species List

On a desktop level, a species list was generated for the quarter degree square (QDS) in which the study area occurs (2627DB) from the Plants of Southern African (POSA) online database (http://posa.sanbi.org/searchspp.php). From the expected species list, potential SSC that may occur on site can be determined in the field, based on the type of habitat identified during the site visit.

4.2.2 Field Assessment

During the field assessment, all alien plant bushclumps were identified and species were recorded. Further to this, random transects were undertaken throughout the site to record broad habitat features, dominant species and any plant SSC present on site.

4.3 Study Limitations

The following limitations were encountered during this study:

- Only a single day site visit was conducted as a consequence, it is possible that some plant SSC present on site were not recorded, and;
- Further to this, any species that was not flowering, fruiting or seed-bearing during the site visit may not have been positively identified to species level.

5 Study Area

5.1 Locality

The study area is located to the east of the R716 servitude, approximately 6.5km south of the town of Vereeniging (Figure 5-1). The site is located in the Sedibeng District Municipality and the Emfuleni Local Municipality in the Gauteng Province. The study site covers an area of 33ha.

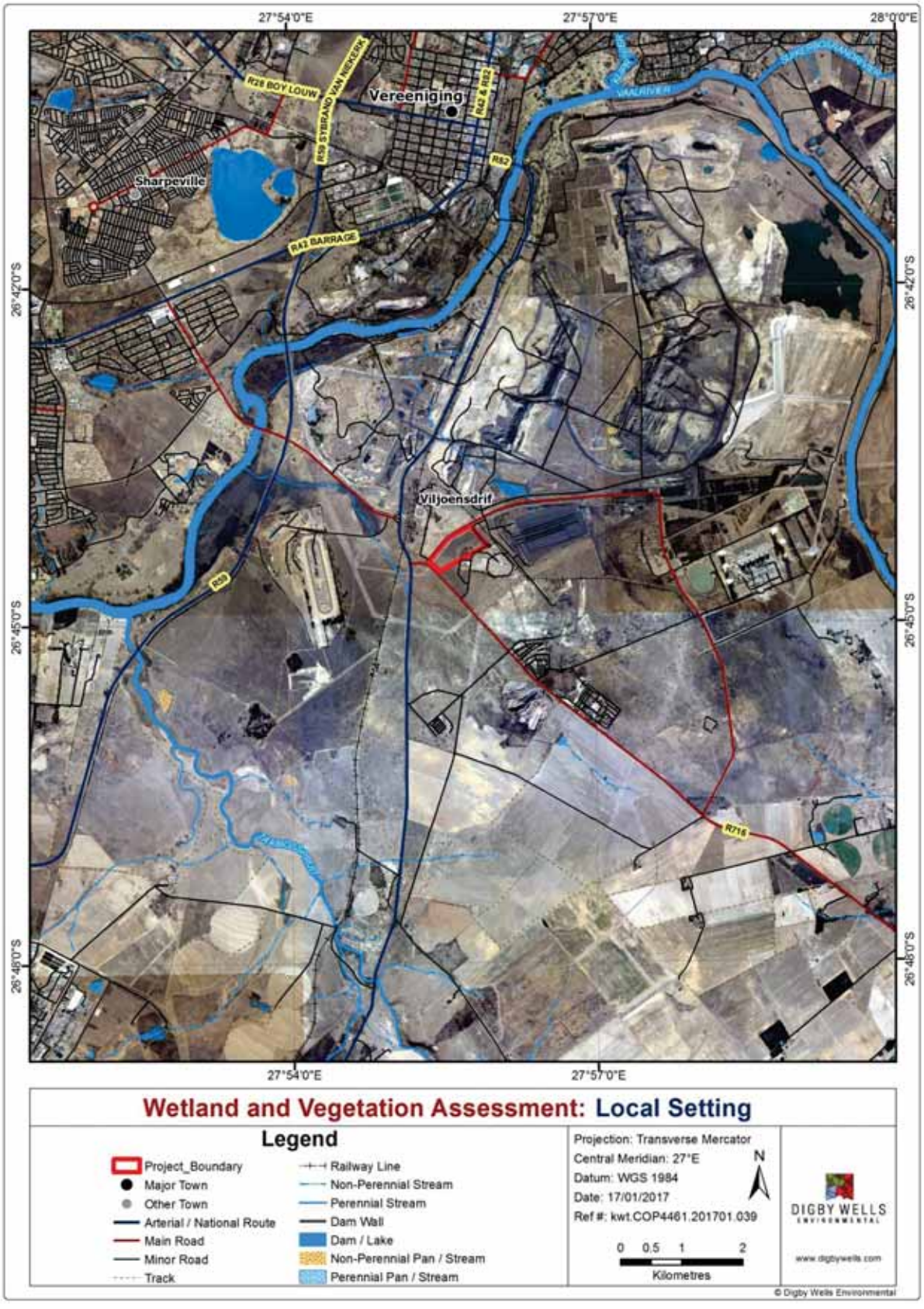

Figure 5-1: Study locality

5.2 Quaternary Catchment

The water resources of South Africa have been divided into Quaternary Catchments, which are regarded as the principle water management units in the country (DWAF 2011). A Quaternary Catchment is a fourth order catchment in a hierarchical classification system in which the primary catchment is the major unit. The project area lies entirely within Quaternary Catchment C22F (tertiary drainage), associated with Leeukop Dam and Vaal River (Figure 5-2).

There are currently nine Water Management Areas that have been established and declared in the 2016 Government Gazette No. 40279 for South Africa. The establishment of these WMAs is to improve water governance in different regions of the country. The project area falls under the Vaal Major (WMA code 5), formerly known as the Upper Vaal. The Vaal Major WMA is one of the second largest and important catchments in the country, supplying water to the mineral and industrial sectors.

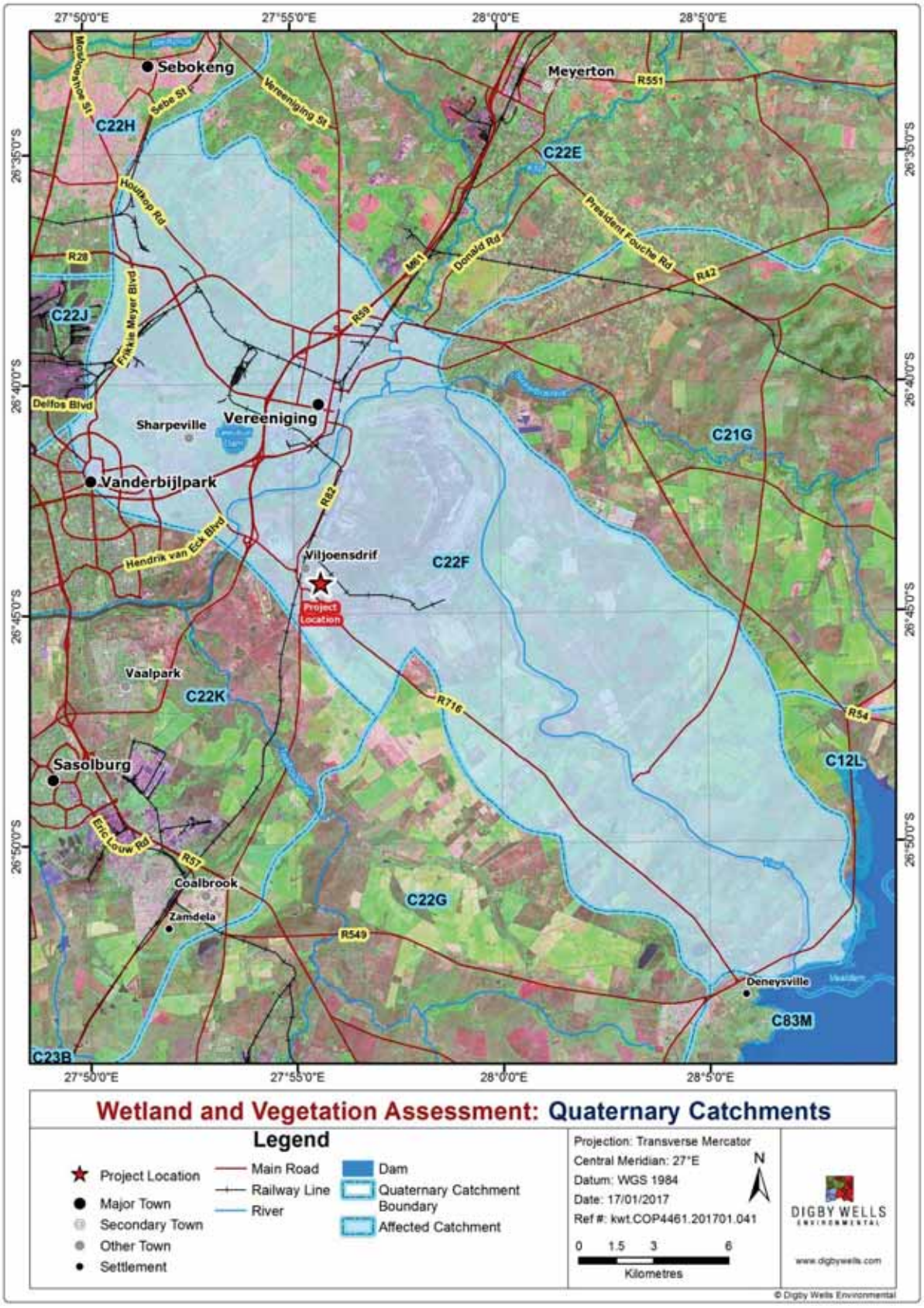

Figure 5-2: Quaternary Catchments

5.3 National freshwater Ecosystem Priority Areas

The National Freshwater Ecosystem Priority Areas (NFEPA) (Nel *et al*. 2011) strategic spatial priorities for conserving the country's freshwater ecosystems and supporting sustainable use of water resources were considered to evaluate the importance of the wetland areas located within the Copper Sunset Mining Right Extension Area.

Table 5-1 below indicates the criteria which were considered for the ranking of wetland areas. Spatial layers (FEPA's) used include the wetland classification and ranking. Figure 5-3 shows that although NFEPA wetlands have been identified within proximity to the site, no NFEPA wetlands occur within the mining extension area.

Table 5-1: National Freshwater Ecosystem Priority Areas (Nel *et al.* 2011) wetland areas in relation to the Copper Sunset Mining Extension Area

Criteria	Rank
Wetlands that intersect with a RAMSAR site.	1
Wetlands within 500 m of an IUCN threatened frog point locality; Wetlands within 500 m of a threatened water bird point locality; Wetlands (excluding dams) with the majority of their area within a sub-quaternary catchment that has sightings or breeding areas for threatened Wattled Cranes, Grey Crowned Cranes and Blue Cranes; Wetlands (excluding dams) within a sub-quaternary catchment identified by experts at the regional review workshops as containing wetlands of exceptional Biodiversity importance, with valid reasons documented; and Wetlands (excluding dams) within a sub-quaternary catchment identified by experts at the regional review workshops as containing wetlands that are good, intact examples from which to choose.	2
Wetlands (excluding dams) within a sub-quaternary catchment identified by experts at the regional review workshops as containing wetlands of biodiversity importance, but with no valid reasons documented.	3
Wetlands (excluding dams) in A or B condition AND associated with more than three other wetlands (both riverine and non-riverine wetlands were assessed for this criterion); and Wetlands in C condition AND associated with more than three other wetlands (both riverine and non-riverine wetlands were assessed for this criterion).	4
Wetlands (excluding dams) within a sub-quaternary catchment identified by experts at the regional review workshops as containing Impacted Working for Wetland sites.	5

Any other wetland (excluding dams).	6

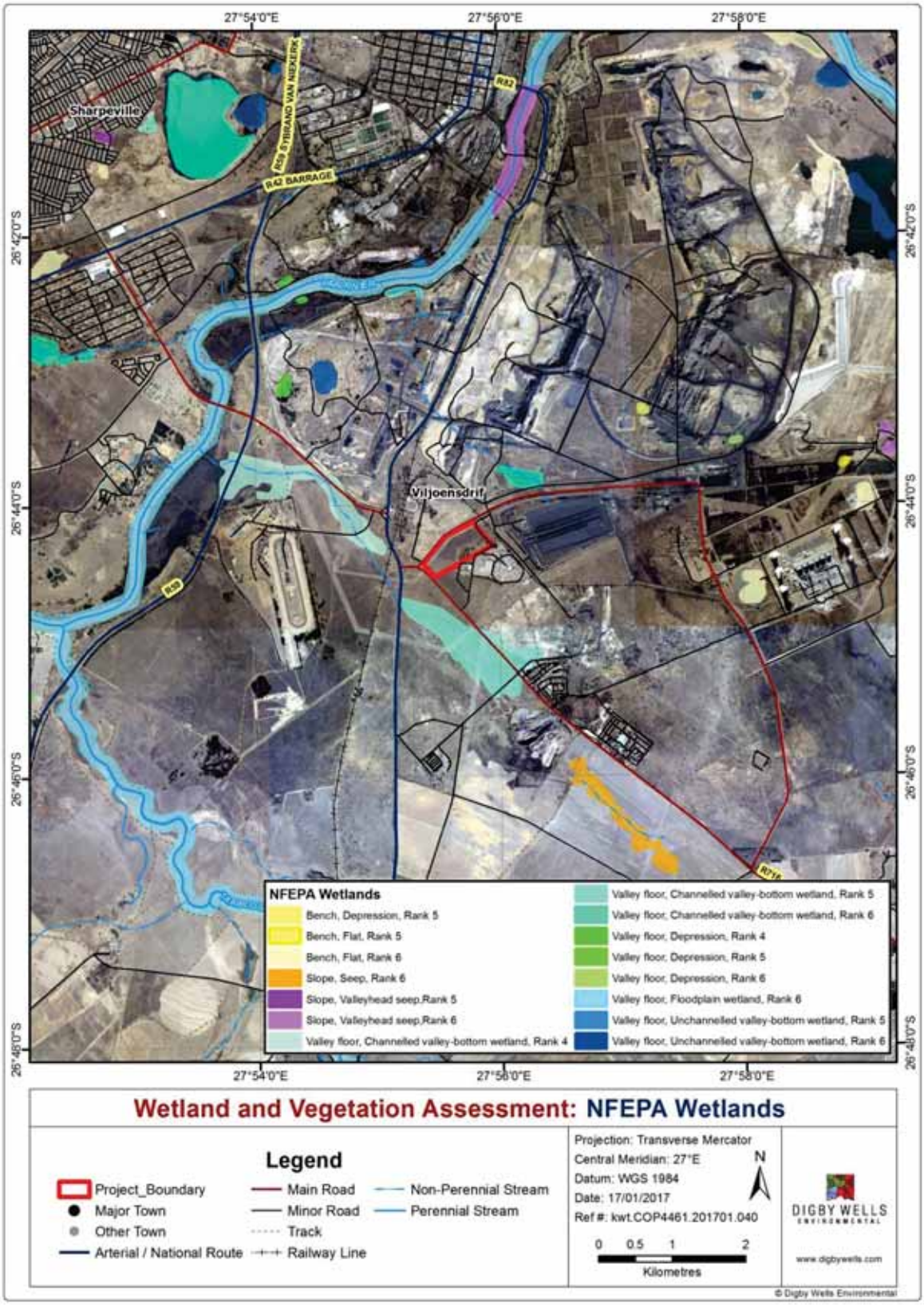

Figure 5-3: National Freshwater Ecosystem Priority Areas (Nel *et al.*, 2011)

5.4 Regional Vegetation

The study area is situated in the Central Free State vegetation type, as represented in Figure 5-4. The Central Free State Grassland is characterised by short grasslands and *Themeda triandra*. However, when degraded these grasslands as well as clay bottomlands and heavy clayey low-lying areas are degraded *Eragrostis curvula* and *Eragrostis curvula* become dominant dwarf karoo bushes and *Senegallia (Acacia) karroo* start to encroach.

The vegetation is listed as vulnerable with a conservation target of 24%. Only small parts are conserved through both private and statutory reserves (Willem Pretorius, Rustfontein and Koppies Dam Nature Reserves) whilst a quarter of the area has been transformed for cultivation purposes or in the process of the dam building. Whilst no serious encroachment has occurred, the degraded areas (southern parts of the vegetation) are vulnerable to dwarf karoo shrubs. The erosion of the vegetation ranges from low (45%) to very low (20%). Common and characteristic species of the Central Free State Grassland are listed in Table 5-2.

Table 5-2: Plant species characteristic of the Central Free State Grassland

Plant form	Species
Graminoids	*Aristida adescensiois* (d), *A. congesta* (d), *Cynodon dactylon* (d), *Eragrostis chloromelas* (d), *E. curvula* (d), *E. plana* (d), *Panicum coloratum* (d), *Setaria sphacelata* (d), *Themeda triandra* (d), *Tragus koelerioides* (d), *Agrostis lachnantha*, *Andropogon appendiculatus*, *Aristida bipartita*, *A. canescens*, *Cymbopogon pospischilii*, *Cynodon transvaalensis*, *Digitaria argyrograpta*, *Elionurus muticus*, *Eragrostis lehmanniana*, *E. micrantha*, *E. obtusa*, *E. racemosa*, *E. trichophora*, *Heteropogon contortus*, *Microchloa caffra*, *Setaria incrassata* and *Sporobolus discosporus.*
Herbs	*Berkheya onopordifolia* var. *onopordifolia*, *Chamaesyce inaequilatera*, *Conyza pinnata*, *Crabbea acaulis*, *Geigeria* aspera var. *aspera*, *Hermannia depressa*, *Hibiscus pusillus*, *Pseudognaphalium luteo-album*, *Salvia stenophylla*, *Selago densiflora* and *Sonchus dregeanus.*
Geophytic Herbs	*Oxalis depressa* and *Raphionacme dyeri.*
Succulent Herb	*Tripteris aghillana* var. *intergrifolia.*
Low Shrubs	*Felicia muricata* (d), *Anthospermum rigidum* subsp. *pumilum*, *Helichrysum dregeanum*, *Melolobium candicans* and *Pentzia globosa.*

Key: (d) – indicates dominant species

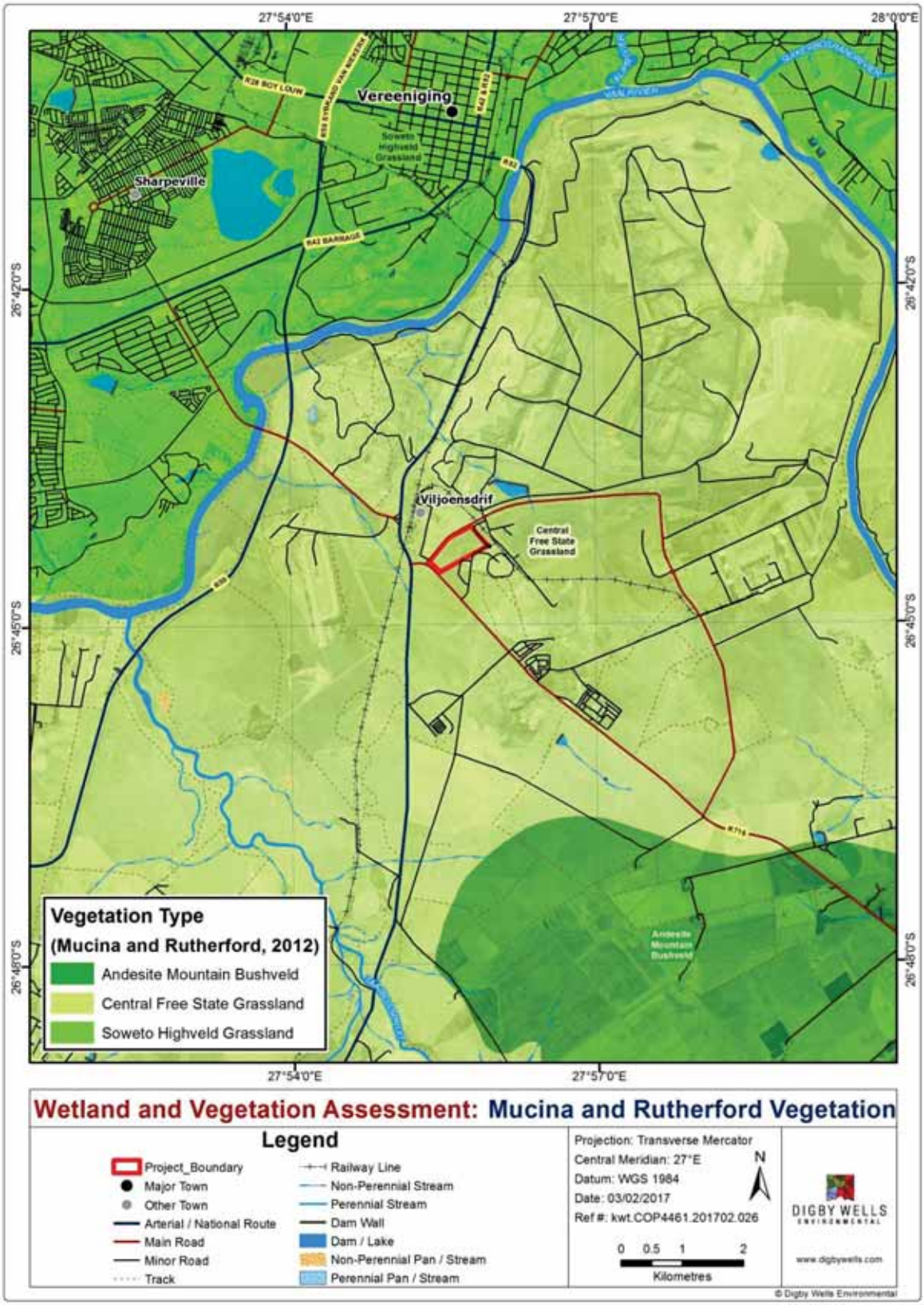

Figure 5-4: Regional Vegetation (Mucina and Ruterford; 2006)

6 Findings

6.1 Wetland Identification and Delineation

The wetland delineation is represented in Figure 6-1 and shows that a wetland area covering 2.8ha has been identified. The wetland has formed artificially due to prolonged inundation due to outflow from the culvert leading into it. As a result of extended periods of saturation, wetland plant species such as: *Typha capensis* (Common Bulrush) and *Juncus effuses* (Common Rush) have established. Examples of wetland indicators are represented in Figure 6-2.

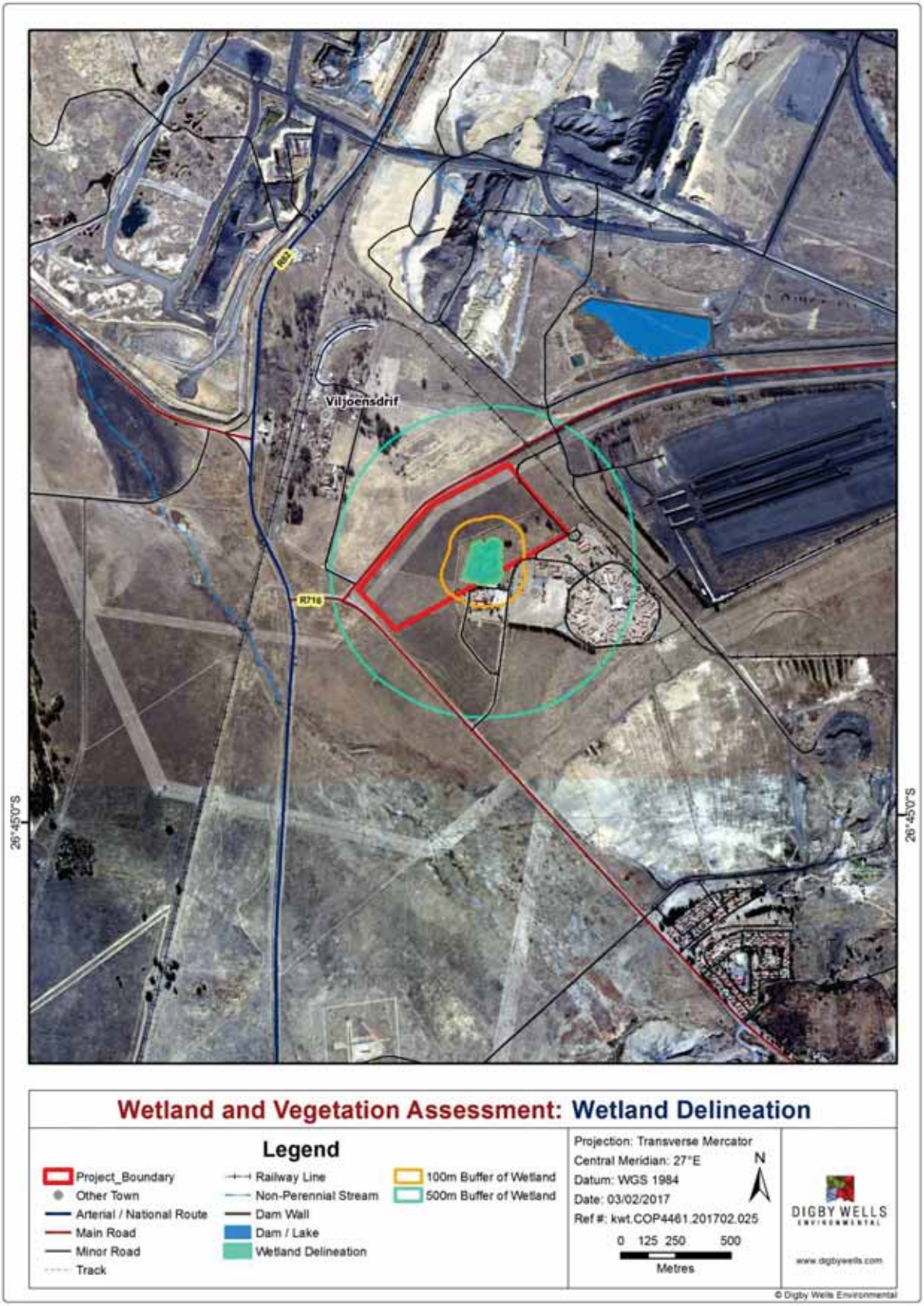

Figure 6-1: Wetland delineation

Figure 6-2: Examples of wetland plant species identified on site (A: *Juncus effusus* and B & C: *Typha capensis* indicated by red arrows)

6.1.1 Wetland Integrity and Functionality

Since the wetland has formed due to artificial conditions, it does not represent an area of any particular ecological sensitivity or importance. Much of the vegetation was comprised of alien species and there was evidence of erosion, channelisation and excessive sedimentation. The following scores were assigned to the wetland:

- PES: E – Critically modified, and
- EIS: 4 – Low importance and sensitivity.

6.2 Description of Vegetation Habitat

The study site shows signs of historical disturbance but many of the species identified in undisturbed areas were representative of the regional vegetation type described in section 5.4. Figure 6-3 represents an example of the vegetation landscape identified on site, comprise of *Eragrostis*-dominated grassland. Where areas have been rehabilitated, they have been colonised by alien plant species such as *Conyza* spp. and *Tagetes minuta*. The majority of these alien plants are not considered as problem plants and do not hold any invasive species categories, however, they do reduce overall plant diversity and do not offer the best soil stability to prevent the onset of erosion. No Red Data or protected plant species (Species of Special Concern) were identified on site during the brief field investigation, however, some may occur. *Boophone disticha* (Tumbleweed) has been reported on site previously and this species is listed as Declining under the national Red Data species list and is also provincially protected. As a consequence, if it is encountered, it should not be removed.

Figure 6-3: Landscape of the grassland vegetation identified on site

6.2.1 Alien and Invasive Plant Species

Invasion by destructive alien plant species erodes the natural capital of ecosystems, compromises their stability and is a growing problem in South Africa (Richardson and van Wilgen 2004). Species such as *Acacia mearnsii* (Black Wattle) and *Eucalyptus* spp. out-compete native species, forming dense mono-specific stands. This reduces the area available for native plant species to colonise, as well as land for grazing by domestic and wild animals. Alien plant species have also been classified according to National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA), as published in August 2014 (GN R599 in *GG* 37886 of 1 August 2014) into the following categories:

- Category 1a: Species requiring compulsory control;
- Category 1b: Invasive species controlled by an invasive species management programme;
- Category 2: Invasive species controlled by area, and;
- Category 3: Invasive species controlled by activity.

Further to this, alien plants have also been listed under the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983). A total of 10 alien or problem plant species were

recorded within the mining extension area (refer to Table 6-1 for the relevant alien categories); two of these have been assigned alien plant categories according to NEMBA. These species have established due to disturbance of the soil, due to the history of mining activity in the area.

Figure 6-4 represents examples of some of the alien plant species recorded on site and Figure 6-5 shows species that were not recorded on site but were observed in the greater Copper Sunset sand mining right and as a result, may establish on site (including *Datura ferox* (Thorn Apple) and *Solanum mauritianum* (Bugweed).

Table 6-1: List of alien plant species recorded on site

Family	Species Name	Common Name	Alien Invasive Category (CARA; NEMBA)
Asteraceae	*Bidens pilosa*	Black Jacks	No category
	Cirsium vulgare	Scotch Thistle	1; 1b
	Seriphium plumosum	Bankrupt Bush	Native invader
	Tagetes minuta	Khakibos	No category
	Verbena bonariensis	Purpletop Vervain	1b
Pinaceae	*Pinus patula*	Cluster Pine	No category
Myrtaceae	*Eucalyptus cinerea*	Silver Dollar Eucalyptus	2
Poaceae	*Cortaderia selloana*	Pampas Grass	1b
Salicaceae	*Populus alba*	White Poplar	2; 2
	Populus x canescens	Grey Poplar	2

Figure 6-4: Examples of alien and problem plant species recorded on site (A and B: *Bidens pilosa* (Black Jacks); C and D: *Seriphium plumosum*, (Bankrupt Bush); E and F: *Tagetes minuta* (Khakibos); G and H: *Conyza albida* (Fleabane); I: *Pinus patula* (Cluster Pine) and J: *Populus alba* (Poplar))

Figure 6-5: Examples of alien plant species found in the greater Copper Sunset mining area that may establish on site (A and B: *Datura ferox* and C and D: *Solanum mauritianum*)

7 Conclusion and Recommendations for Rehabilitation

The mining right area is located within the grassland biome and the Central Free State Grassland vegetation type. Due to this, the area would not naturally have harboured many woody species, like trees and shrubs, but rather an assemblage of grasses and forbs.

Areas that have been rehabilitated have been colonised primarily by alien plant species; the majority of which do not hold any problem plant species status. It is advisable, however, that all areas that have been rehabilitated are burnt under a controlled fire regime and re-seeded with native grassland species. Species such as *Cynodon dactylon* (Couh Grass), *Digitaria eriantha* (Digit Grass) and *Chloris gayana* (Rhodes Grass) should be included in the seed-mix. C. dactylon in particular has excellent soil-holding capacity and can spread quite rapidly, reducing the risk of erosion.

All alien plant species identified on site should be removed manually or by means of herbicides in areas with dense infestation (see Annexure A: ID toolkit and recommended management measures) and the area should be monitored for alien plant species emergence. Please consultant registered herbicide specialist if herbicides are considered. Upon emergence, all alien plants should be manually removed. Individuals should not be allowed to reach seed-bearing or flowering maturity to prevent further spread. Alien plant monitoring should take place for a period of 2-3 years after rehabilitation and re-seeding have taken place.

If any development is planned for the area associated with the wetland, water use authorisation should be applied for with the DWS. This wetland, however, is not in a good ecological condition and has formed due to unnatural circumstances.

8 References

Kotze, D.C., Marneweck, G.C., Batchelor, A.L., Lindley, D.C., and Collins, N.B. 2007. A Technique for rapidly assessing ecosystem services supplied by wetlands. Mondi Wetland Project.

Marneweck, G.C. and Batchelor, A.L. 2002. Wetland inventory and classification. In Palmer, R.W., Turpie, J., Marneweck, G.C. and Batchelor, A.L. (Eds). Ecological and Economic Evaluation of Wetlands in the Upper Olifants River Catchment. Water Research Commission Report No K5/1162.

Mucina, L., Rutherford, M.C. & Powrie, L.W. (eds) 2007. Vegetation Map of South Africa, Lesotho and Swaziland, edn 2, 1:1 000 000 scale sheet maps. South African National Biodiversity Institute, Pretoria. ISBN 978-1-919976-42-6.

Nel J.L., Murray K.M., Maherry A.M., Petersen C.P., Roux D.J., Driver A., Hill L., van Deventer H., Funke N., Swartz E.R., Smith-Adao L.B., Mbona N., Downsborough L., Nienaber S. 2011. Technical report for the National Freshwater Ecosystem Priority Areas project. Water Research Commission. WRC report No. 1801/2/11, ISBN 978-1-4312-0149-5. Set no. 978-1-4312-0148-7.

Plants of Southern Africa Online Database. Accessed at: http://posa.sanbi.org/searchspp.php. 2017-02-02 at18:00pm.

Rountree, M.W., H. Malan and B. Weston (editors). 2012. Manual for the Rapid Ecological Reserve Determination of Inland Wetlands (Version 2.0). Joint Department of Water Affairs/Water Research Commission Study

DWAF, 2005. A practical field procedure for identification and delineation of wetlands and riparian areas. Department of Water Affairs and Forestry, Pretoria.