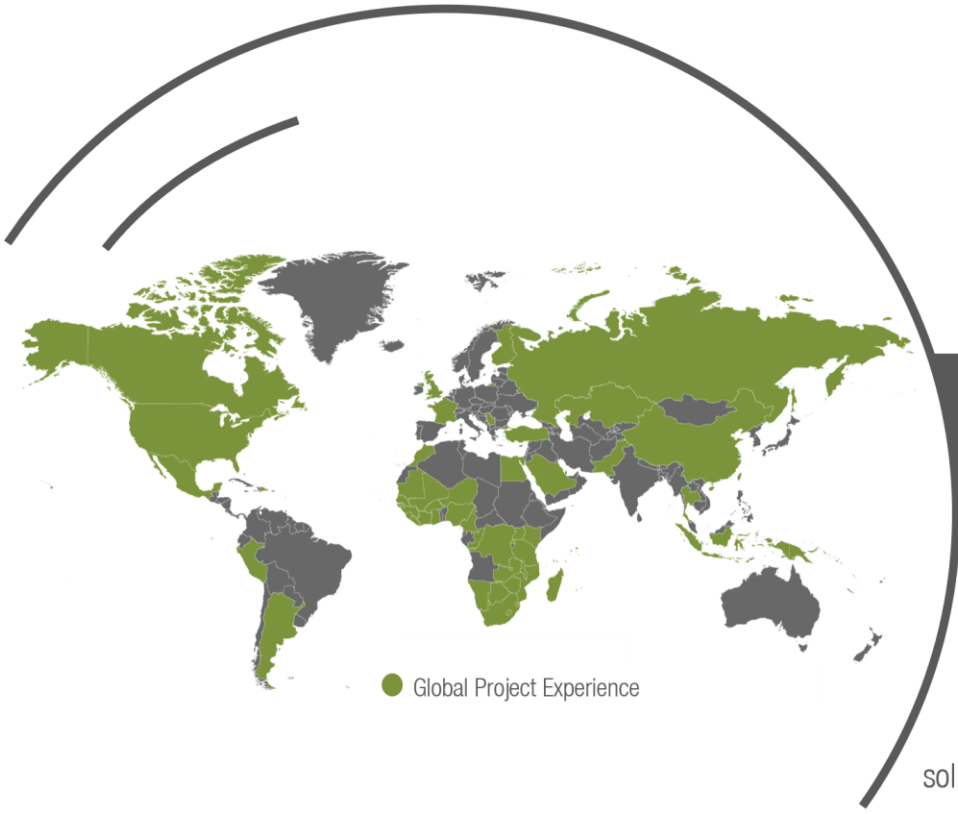

DIGBY WELLS
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Pan African Resources PLC (PAR) Environmental Application Process

Visual Impact Assessment

Prepared for:
Pan African Resources

Project Number:
PAR7273

July 2022

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This document has been prepared by Digby Wells Environmental.

Report Type:	Visual Impact Assessment
Project Name:	Pan African Resources PLC (PAR) Environmental Application Process
Project Code:	PAR7273

Name	Responsibility	Signature	Date
Johan Vermeulen	Reporting		July 2022
Prevlan Chetty	Technical Review		July 2022
Brett Coutts	Senior Review		July 2022

EXECUTIVE SUMMARY

Digby Wells Environmental (hereafter Digby Wells) has been appointed to undertake an Environmental Application Process and associated specialist studies for the Mogale Cluster - Mining Right (GP) 30/5/1/2/2 (206) Mining Right (MR) and, more specifically for the proposed construction of a large-scale gold tailings retreatment operation. Pan African Resources PLC (PAR) has entered into a Sale and Purchase Agreement for the acquisition of the shares in and claims against Mogale Gold (Pty) Ltd (Mogale Gold). The agreement was entered into between PAR and the liquidators of Mintails Mining SA (Pty) Ltd (in liquidation) (MMSA). MMSA is the holding company of Mogale Gold. The intended transaction is subject to a due diligence investigation which is in the process of being concluded.

Mogale Gold owns the right to extract and process gold from tailings recourses by reprocessing old gold mine slimes dams and sandy mine dumps left by the extensive historic mining activities that have taken place in the area since 1888. PAR is only interested in the surface operations associated with Mining Right (MR) 206 (i.e., Tailings Storage Facilities (TSFs) for reclamation, processing and deposition), and therefore the focus of this application process.

The project site is situated in the Mogale City Local Municipality (MCLM), Gauteng Province. The site comprises of existing infrastructure such as tailings dams and open pits that will be used for the deposition of tailings materials. A process plant, overland pumping and piping inclusive of associated water management infrastructure will form part of the proposed infrastructure that will require an authorisation. Once the open pit is filled to capacity, a new TSF will potentially be constructed on the footprint area of one of the reclaimed TSF sites (1L23-1L25) (Figure 2 3). The footprint of the area is 2,923.3 ha which considers MR 206 and associated infrastructure.

The project consists of 120 Mt of tailings to be reprocessed and firstly deposited into the West Wits Pit (current authorisation in place for in-pit deposition) and then undertake deposition of the footprint of 1L23-1L25 footprint (New Tailings Facility) once capacity has been reached within the West Wits Pit. The procedures followed in this assessment involved (i) the characterisation of the visual / aesthetic character in the surrounding environment, and (ii) a viewshed analysis to determine the level of visibility of the proposed infrastructure and activities throughout a 20km Zone of Visual Influence (ZVI).

Based on the review and interpretation of existing spatial datasets and additional information sources, the visual / aesthetic character of the environment surrounding the site location may be described as largely urban and highly modified. In addition, the MCLM has historically been a key focal point of South Africa's gold-mining sector with mine shafts and TSFs prominent throughout the municipality. It may be argued that mining-related landmarks form a key part of the visual / aesthetic character of the environment and contributes to its sense of place.

A series of viewsheds were run using individual infrastructure features which commonly have the largest visual prominence (i.e. the three proposed TSFs and proposed plant area). The

resulting viewsheds were then overlain with key sensitive population, transport and protected area receptors that were extracted from existing spatial datasets. These receptors included (i) dwellings situated throughout the 20km ZVI (ii) major roads, and (iii) a number of protected areas (which includes the Cradle of Humankind World Heritage Site) found throughout the northern section of the 20km zone surrounding the site.

It was found that the overall visibility of the infrastructure elements to the potential sensitive receptors is largely determined by the visibility of the most prominent feature, in this case, the proposed West Wits TSF. The West Wits TSF is expected to be highly visible from the surrounding population, moderately visible from the N14 national highway and highly visible from three of the protected areas (including the Cradle of Humankind World Heritage Site). The 1L23 - 1L25 (North) TSF is expected to exhibit the second-highest visibility to potential sensitive receptors, with a very high expected visibility from the population receptors and a zero, low and very low expected visibility from the remaining ten receptors. The expected visibility associated with the remainder of the infrastructure elements is generally zero with the exception of the population surrounding the proposed operations.

Mainly driven by the duration and probability of the infrastructure elements considered in this assessment and the fact that neither of these components can be changed, the visual impact of the proposed operations during the operational phase is expected to be **minor-negative**.

The extent of the visual impacts of the proposed operations is significantly reduced throughout the impact assessment owing to the relatively low contribution (17.26%) of the proposed infrastructure elements to the cumulative visibility of the elements at the site. In all cases the extent was found to be limited.

Two key external mitigatory factors that play a role in reducing the expected visual impacts across all the infrastructure elements. These are as follows:

- The current visual / aesthetic character of the surrounding environment of which mining related infrastructure forms a significant part.
- The site itself is characterised by largely unrehabilitated surfaces and visually intrusive structural elements.

Taking into consideration the visual/aesthetic character of the surrounding environment and the baseline conditions at the site, it is expected that the measures proposed in DWE (2021a) (and included in this impact assessment as potential mitigation measures) would result in a **minor-positive** visual impact at the conclusion of the decommissioning and closure phase.

The mitigation measures proposed throughout the impact assessment section of this report are as follows:

- The establishment of visual screening mechanisms surrounding the infrastructure elements to reduce visibility from the immediately surrounding population;
- The use of neutral colours for plant-infrastructure to increase visual absorption by the surrounding environment;

- Limiting site clearing activities to the immediate footprints of the proposed infrastructure elements;
- The implementation of the following closure and rehabilitation measures outlined in the DWE (2021a):
    - Removal of buildings, concrete structures, and any other infrastructure;
    - Levelling and shaping of rehabilitated areas; and
    - In situ rehabilitation of TSFs and Sand Dumps.

ABBREVIATIONS

Abbreviation	Description
AW3D30	ALOS Global Digital Surface Model
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPFI	Equator Principles Financial Institution
HOTOSM	Humanitarian OpenStreetMap Team
ESIA	Environmental and Social Impact Assessment
IFC	International Finance Corporation
LiDAR	Light Detection And Ranging
LULC	Land Use / Land Cover
MAMSL	Meters Above Mean Sea Level
MCLM	Mogale City Local Municipality
NEMA	National Environmental Management Act
NEM: PAA	National Environmental Management: Protected Areas Act
NHRA	National Heritage Resources Act
NPAES	National Protected Areas Expansion Strategy
ToR	Terms of Reference
TSF	Tailings Storage Facility
VAC	Visual Absorption Capacity
VIA	Visual Impact Assessment
WRL	Waste Rock Landform
ZVI	Zone of Visual Influence

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1. Introduction

Digby Wells Environmental (hereafter Digby Wells) has been appointed to undertake an Environmental Application Process and associated specialist studies for the Mogale Cluster - Mining Right (GP) 30/5/1/2/2 (206) Mining Right (MR) and, more specifically for the proposed construction of a large-scale gold tailings retreatment operation. Pan African Resources PLC (PAR) has entered into a Sale and Purchase Agreement for the acquisition of the shares in and claims against Mogale Gold (Pty) Ltd (Mogale Gold). The agreement was entered into between PAR and the liquidators of Mintails Mining SA (Pty) Ltd (in liquidation) (MMSA). MMSA is the holding company of Mogale Gold. The intended transaction is subject to a due diligence investigation which is in the process of being concluded.

Mogale Gold owns the right to extract and process gold from tailings recourses by reprocessing old gold mine slimes dams and sandy mine dumps left by the extensive historic mining activities that have taken place in the area since 1888. PAR is only interested in the surface operations associated with Mining Right (MR) 206 (i.e., Tailings Storage Facilities (TSFs) for reclamation, processing and deposition), and therefore the focus of this application process.

The project consists of 120 Mt of tailings to be reprocessed and firstly deposited into the West Wits Pit (current authorisation in place for in-pit deposition) and then undertake deposition of the footprint of 1L23-1L25 footprint (New Tailings Facility) once capacity has been reached within the West Wits Pit.

Alternatives are being considered for potential deposition of tailings material into the other pits associated, such as Monarch and Emerald Pits.

It must be noted that once the West Wits Pits reaches capacity the surface deposition will extend in a northern direction from the pit onto surface, expanding the deposition footprint associated with West Wits Pit.

There are six dumps being considered for reprocessing, the largest of which amounts to 57.9 Mt, while the smallest contains 0.57 Mt. The primary location of processed tailings storage has been earmarked for deposition in the West Wits Pit. There are three smaller dumps which could also be included and reprocessed as part of the project namely 1L4, 1L5 and 1L6.

2. Project Description

The site is situated in the Mogale City Local Municipality (MCLM), Gauteng Province. The site comprises of existing infrastructure such as tailings dams and open pits that will be used for the deposition of tailings materials. A process plant, overland pumping and piping inclusive of associated water management infrastructure will form part of the proposed infrastructure that will require an authorisation. Once the open pit is filled to capacity, a new TSF will potentially be constructed on the footprint area of one of the reclaimed TSF sites (1L23-1L25) (Figure 2-3). The footprint of the area is 2,923.3 ha which considers MR 206 and associated infrastructure.

Ancillary infrastructure such as pipelines, powerlines and pumps will be required for the proposed reclamation activities and will be included in support of the Environmental Application Process, which will be undertaken.

2.1. Project Locality

The Mining Right Area of the Mintails Mogale Cluster includes: (i) West Wits Pit, (ii) 1L23 – 1L25 TSFs, (iii) Monarch Pit, (iv) Emerald Pit, (v) Lancaster Pit, and (vi) Princess Pits. An existing Water Use License (WUL) No. 27/2/2/C423/1/1 was issued on 22 November 2013 to Mintails Mining SA (Pty) Ltd: Mogale Gold. The mining right is located on Portions 66 and 99 of the farm Waterval 174 IQ and portions 136 and 209 of the farm Luipaardsvlei 246 IQ.

The project is within the Mogale City Local Municipality, which is located within the West Rand District Municipality (WRDM). MCLM is the regional services authority and the area falls under the jurisdiction of the Krugersdorp Magisterial District. The project is about 4 km south of Krugersdorp and north-east of Randfontein, approximately 10 km off the N14 National Road in the Gauteng Province, in an area that has been transformed by past gold mining activities.

Figure 2-1, Figure 2-2 and Figure 2-3 show the regional setting, local setting and proposed site layout respectively.

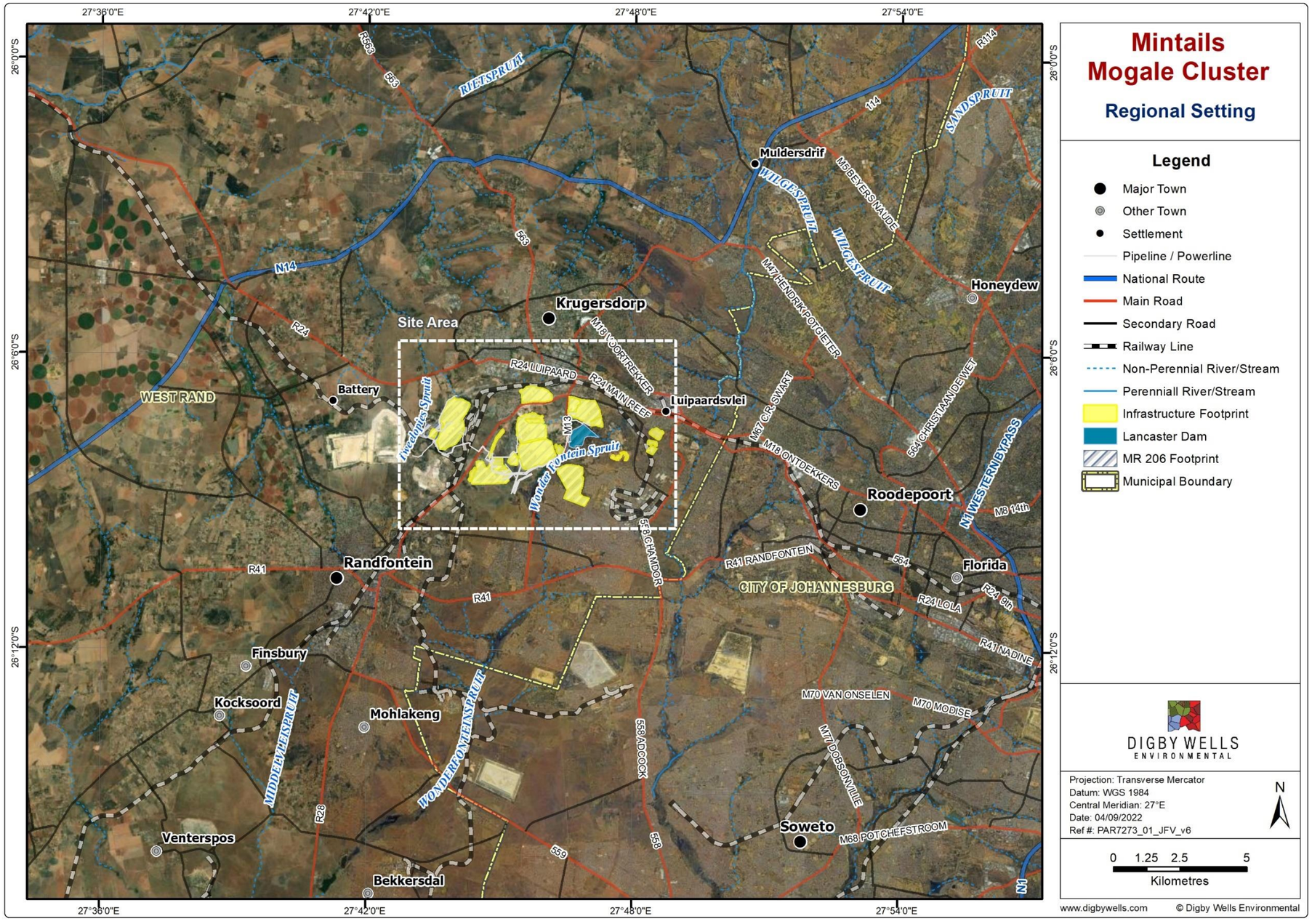

Figure 2-1: Regional Setting

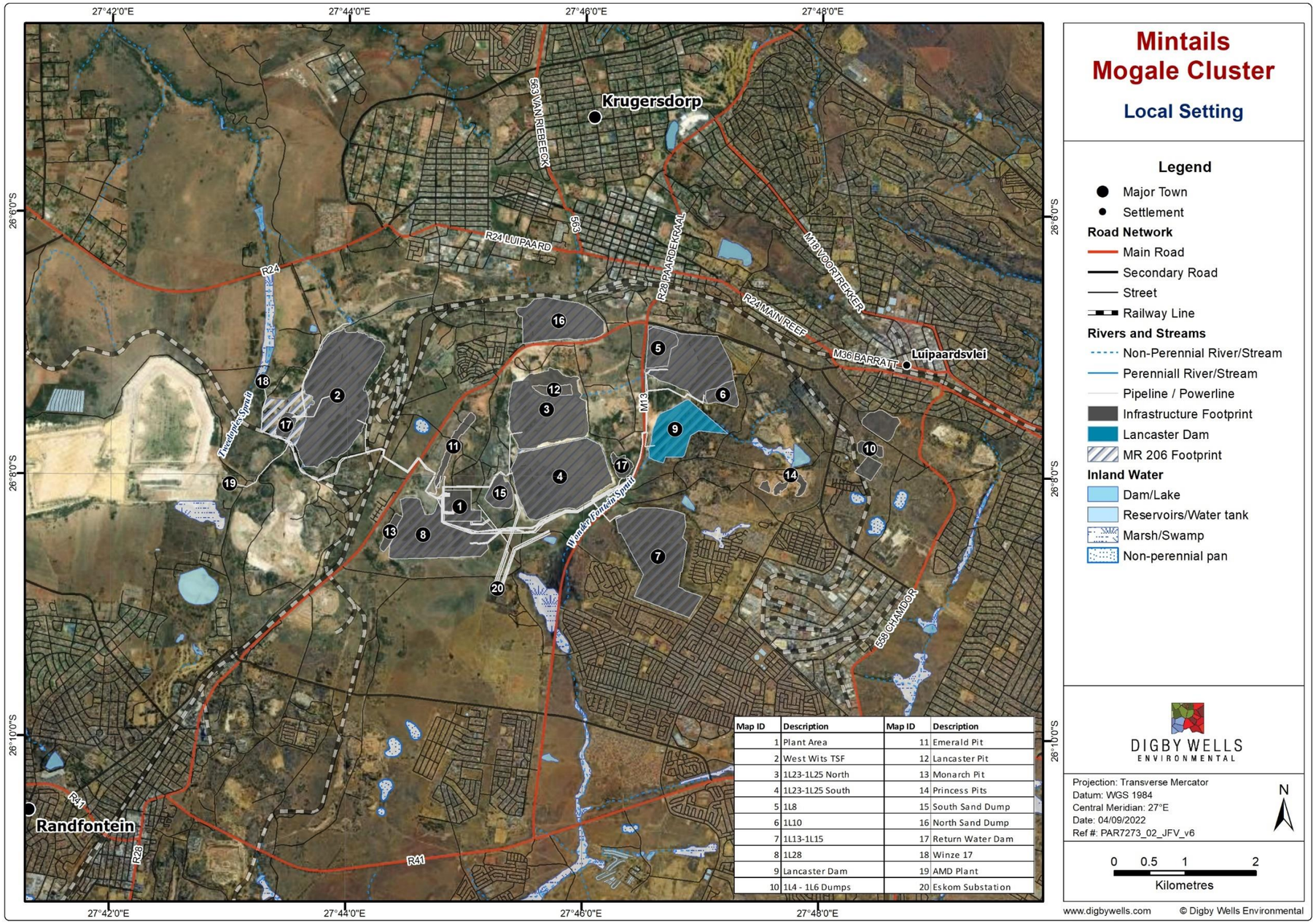

Figure 2-2: Local Setting

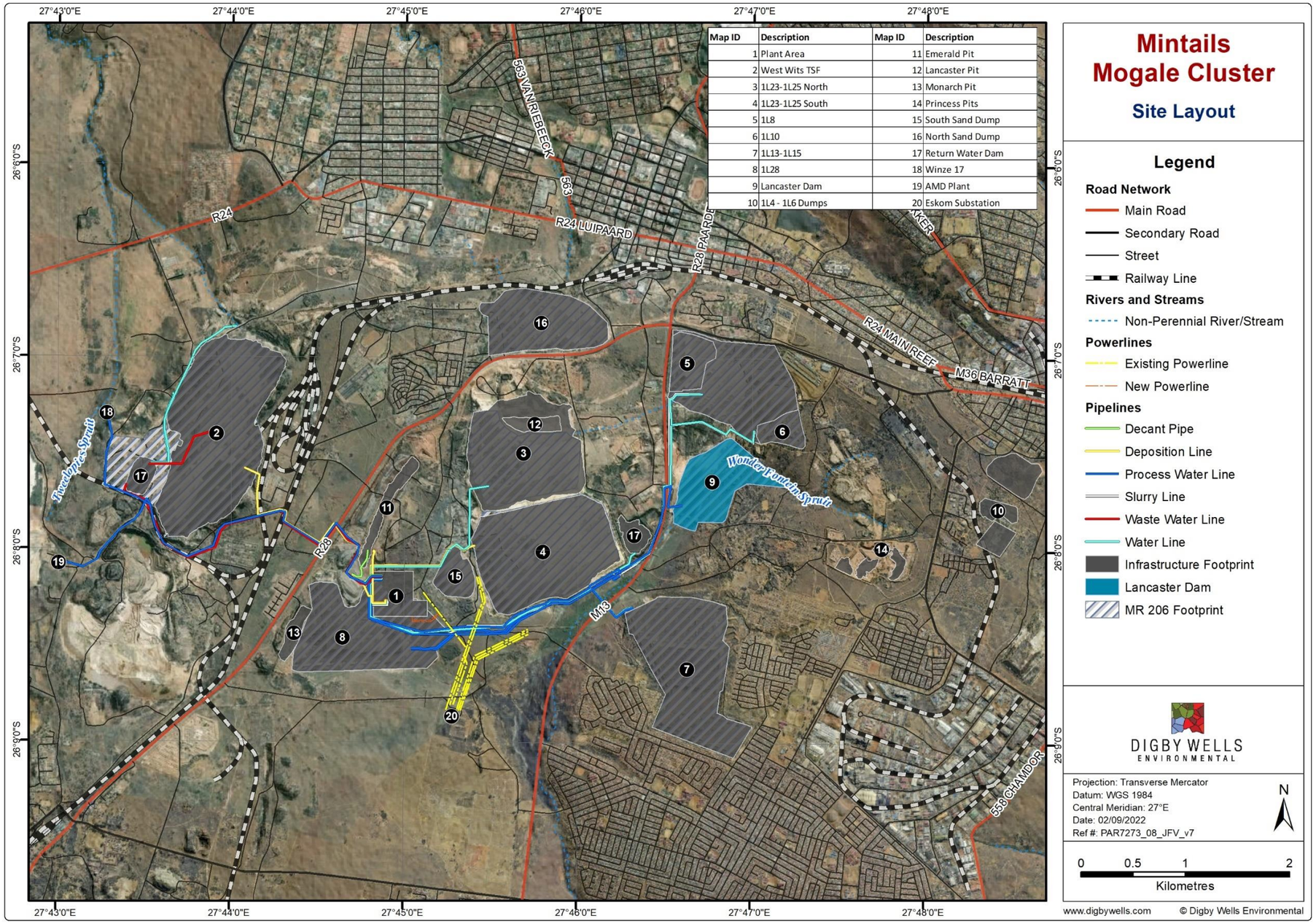

Figure 2-3: Proposed Layout

2.2. Proposed Infrastructure and Activities

PAR plan to undertake activities relating to reclamation associated with gold-bearing TSFs through hydraulic reclamation (Table 2-1).

Table 2-1: Project Phases and Associated Activities

Project Phase	Associated Activities
Construction Phase	Site clearing for the construction of the new TSF, plant and ancillary infrastructure such as pipelines, pump stations, electrical supply etc.
	Construction of the new TSF, plant and ancillary infrastructure.
	Employment and procurement for construction related activities.
Operational Phase	Hydraulic reclamation of the associated historic tailings facilities and sand dumps
	Operation of pump stations during the operational phase.
	Maintenance of pipeline routes during the operational activities.
	Infilling of processed tailings material into the West Pits Pit and other potential pits.
	Surface tailings deposition within the West Wits Pit.
	Tailings deposition onto the historic footprint of 1L23-1L25.
	Production of Gold.
	Progressive rehabilitation of the new tailings facility footprints (West Pits TSF and 1L23-1L25 TSF.
	Employment and procurement for operational related activities.
Decommissioning Phase	Removal, decommissioning and rehabilitation of surface infrastructure such as pipelines, powerlines, pumps etc. footprints.
	Removal, decommissioning and rehabilitation of the processing plant footprint.
	Rehabilitation of the old TSF footprints.
	Rehabilitation of the old Mintails Processing Plant footprint.
	Final rehabilitation of the two tailings facilities (West Wits Pit TSF and New TSF).
	General rehabilitation of the surrounding area, including wetland rehabilitation.

3. Terms of Reference

The Terms of Reference (ToR) for the VIA are to:

- Describe the baseline visual characteristics of the proposed Project site and surrounding area.
- Identify, describe, and assess the expected significance of potential visual impacts that may arise due to the implementation of the project.
- Recommend appropriate mitigation measures and management actions to avoid or minimise potential negative impacts with the proposed project.

4. Data & Sources

The datasets used in this assessment are listed in Table 4-1 below.

Table 4-1: Data Sources

Dataset	Source	Date
Digital Surface Model (Regional)	ALOS Global Digital Surface Model (AW3D30)	2021
Digital Terrain Model (Site Specific)	Client Provided LiDAR-derived Digital Terrain Model	2020
Land Cover*	ESRI 10m Global Land Cover	2020
Population Distribution	Eskom SPOT Building Count (2006 - 2012) dataset of classified built-up structure distribution.	2006 - 2012
Proposed TSF Designs	Client Provided	2021
Proposed Plant Height	Client Provided	2022
Protected Areas	National Protected Areas Expansion Strategy (NPAES) Formal Protected Areas of South Africa	2016
Roads	Humanitarian OpenStreetMap (HOTOSM) South Africa Roads database	2020
Vegetation	Mucina & Rutherford: Vegetation Map of South Africa, Lesotho and Swaziland.	2012

*Land Cover Dataset enhanced through validation and class-additions using Satellite Image Backdrop.

5. Relevant Legislation, Standards and Guidelines

The following international, national and regional documents form part of the legislative and policy framework of the visual assessment.

5.1. International Finance Corporation Performance Standards and Equator Principles

Visual assessments are required by the International Finance Corporation (IFC) Performance Standards (IFC, 2012) and the Equator Principles (EPFI, 2013). These standards will be treated as a best practice guideline.

Equator Principle 3: Applicable Environmental and Social Standards states that "the Equator Principles Financial Institution (EPFI) will require that the Assessment process evaluates the compliance with the applicable standards as follows:

- For Projects located in Non-Designated Countries, the Assessment process evaluates compliance with the then applicable IFC Performance Standards on Environmental and Social Sustainability (Performance Standards) and the World Bank Group (WBG) Environmental, Health and Safety Guidelines (EHS Guidelines); and
- For Projects located in Designated Countries, the Assessment process evaluates compliance with relevant host country laws, regulations and permits that pertain to environmental and social issues. Host country laws meet the requirements of environmental and/or social assessments (Principle 2), management systems (Principle 4), Stakeholder Engagement (Principle 5) and, grievance mechanisms (Principle 6)."

The Equator Principles Association defines Designated Countries as "those countries deemed to have robust environmental and social governance, legislation and institutional capacity designed to protect their people and the natural environment." South Africa is not on the Equator Principles Association's list of Designated Countries and therefore the IFC Performance Standards are applicable to this Project (EPFI, 2013).

IFC Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts is applicable to the EIA and all specialist studies including the visual assessment. Performance Standard 1 underscores the importance of managing environmental and social performance throughout the life of a project. The objectives of this Performance Standard are:

- To identify and evaluate environmental and social risks and impacts of the project;
- To adopt a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimise impacts, and, where residual impacts remain, compensate/offset for risks and impacts to workers, Affected Communities and the environment;
- To promote improved environmental and social performance of clients through the effective use of management systems;

- To ensure that grievances from Affected Communities and external communications from other stakeholders are responded to and managed appropriately; and
- To promote and provide means for adequate engagement with Affected Communities throughout the project cycle issues that could potentially affect them and to ensure that the relevant environmental and social information is disclosed and disseminated (IFC, 2012).

IFC Performance Standard 3: Resource Efficiency and Pollution Prevention is applicable to the visual assessment. Performance Standard 3 recognises that increased economic activity and urbanisation often generate increased levels of pollution to air, water and land, and consume finite resources in a manner that may threaten people and the environment at the local, regional and global levels. For the purposes of this Performance Standard, the term 'pollution' is used to refer to both hazardous and non-hazardous chemical pollutants in the solid, liquid, or gaseous phases, and includes other components such as pests, pathogens, thermal discharge to water, Greenhouse Gas (GHG) emissions, nuisance odours, noise, vibration, radiation, electromagnetic energy and the creation of potential visual impacts including light (IFC, 2012).

IFC Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources is applicable to the visual assessment. Performance Standard 6 recognises that protecting and conserving biodiversity, maintaining ecosystem services, and sustainably managing living natural resources are fundamental to sustainable development. Ecosystem services are the benefits that people, including businesses, derive from ecosystem services. Ecosystem services are organised into four types:

- Provisioning services, which are the products people obtain from ecosystems;
- Regulating services, which are the benefits people obtain from the regulation of ecosystem processes;
- Cultural services, which are the nonmaterial benefits people obtain from ecosystems; and
- Supporting services, which are the natural processes that maintain the other services.

Examples of cultural services include natural areas that are sacred sites and areas of importance for recreation and aesthetic enjoyment (IFC, 2012).

IFC Performance Standard 8: Cultural Heritage applies to the visual assessment. Performance Standard 8 recognises the importance of cultural heritage for current and future generations. For the purposes of this Performance Standard, cultural heritage refers to:

- Tangible forms of cultural heritage, such as tangible movable or immovable objects, property, sites, structures, or groups of structures, having archaeological (prehistoric), paleontological, historical, cultural, artistic and religious values;
- Unique natural features or tangible objects that embody cultural values, such as sacred groves, rocks, lakes, and waterfalls; and

- Certain instances of intangible forms of culture that are proposed to be used for commercial purposes, such as cultural knowledge, innovations, and practices of communities embodying traditional lifestyles.

Tangible cultural heritage is considered a unique and often non-renewable resource that possesses cultural, scientific, spiritual, or religious value and includes moveable or immovable objects, sites, structures, groups of structures, natural features, or landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural value. The requirements of Performance Standard 8 do not apply to the cultural heritage of Indigenous Peoples which is covered under Performance Standard 7 (IFC 2012).

5.2. National Legislation and Policy

At a national level, the following legislative documents potentially apply to the visual assessment:

- Regulations in Chapter 5 (Integrated Environmental Management) of the NEMA, 1998 (Act No. 107 of 1998) (NEMA) and the Act in its entirety. The Act states that “the State must respect, protect, promote and fulfil the social, economic and environmental right of everyone…” Landscape is both moulded by, and moulds, social and environmental features;
- The National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) and related provincial regulations – in some instances there are policies or legislative documents that give rise to the protection of listed sites. The NHRA states that it aims to promote “good management of the national estate, and to enable and encourage communities to nurture and conserve their legacy so that it may be bequeathed for future generations”. A holistic landscape whose character is a result of the action and interaction and/or human factors has strong cultural associations as societies and the landscape in which they live are affected by one another in many ways; and
- Section 17 of the National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) (NEM: PAA) sets out the purposes of the declaration of areas as protected areas which includes the protection of natural landscapes. Landscapes are defined by the natural, visual and subjectively perceived landscape; these aspects of a landscape are intertwined to form a holistic landscape context.

5.3. Guidelines

The “Guideline for involving visual and aesthetic specialists in EIA processes” document by Oberholzer (2005) has been used as a best practice guideline for this Visual Impact VIA. Although these guidelines were developed for the Western Cape province of South Africa they are relevant for this VIA as “the guidelines promote the principles of EIA best practice without being tied to specific legislated national or provincial EIA terms and requirements” (Oberholzer, 2005).

6. Methodology

6.1. Determining the Baseline Environment

Determinations of the baseline environment are critical in characterising the existing sense of place for the study area. The sense of place is composed of the topography, the regional vegetation and the existing environment.

6.2. Receptor Identification

Potential receptors were identified using the following datasets listed in Table 4-1:

- Eskom SPOT Building Count;
- National Protected Areas Expansion Strategy (NPAES) Formal Protected Areas of South Africa;
- Humanitarian OpenStreetMap Team (HOTOSM) South Africa Roads database.

Where necessary satellite backdrop imagery was used to validate and/or enhance the data to ensure the highest possible level of accuracy. The receptors identified are discussed in more detail in Section 8.2 below.

6.3. Viewshed Modelling

The topographical representation of the project area was derived using a combination of the ALOS Global Digital Surface Model (AWD3D30) and client provided Light Detection And Ranging (LiDAR) datasets which were merged to represent a continuous raster surface. Using geospatial modelling techniques, a series of viewsheds were then run using individual infrastructure features which commonly have the largest visual prominence. The viewshed modelling techniques applied utilise a combination of ArcGIS and GlobalMapper software environments to identify areas from which the proposed development will be potentially visible. The procedure then also categorises the magnitude of visual impact which is determined by the distance from the development and how much of the infrastructure is visible to the receptor area. Visual exposure and the visual impact of a development diminish exponentially with distance (Oberholzer, 2005).

The concept of viewshed modelling is depicted in Figure 6-1. The topography denotes whether a development will be visible from a receptor. In Figure 6-1 the development is only visible from the receptors within the valley and on the slopes of the hills facing it. The development will be hidden from all receptors beyond the first hills.

Figure 6-1: Theoretical background of viewshed modelling

Viewshed models were created for daytime conditions only. These viewshed models are based on the topography only and do not take the screening effect of vegetation into account. The viewshed models depict worst case scenarios and show the areas from which the Project may potentially be visible.

Based on findings from the field work, along with the sense of place categorisation for this project, the Zone of Visual Influence (ZVI) was determined to be within 20-kilometre. Table 6-1 below lists the various infrastructure elements that were run as part of the assessment.

Table 6-1: Veiwshed Transmitter Parameters

Proposed Infrastructure	Modelled Height (m)
West Wits TSF	48
1L3 - 1L5 North TSF	40
1L3 - 1L5 South TSF	30
Preferred Plant Location	30

6.4. Impact Assessment Methodology

Impacts and risks have been identified based on a description of the activities to be undertaken. Once impacts have been identified, a numerical environmental significance rating process will be undertaken that utilises the probability of an event occurring and the severity of the impact as factors to determine the significance of a particular environmental impact.

The severity of an impact is determined by taking the spatial extent, the duration and the severity of the impacts into consideration. The probability of an impact is then determined by the frequency at which the activity takes place or is likely to take place and by how often the type of impact in question has taken place in similar circumstances.

Following the identification and significance ratings of potential impacts, mitigation and management measures will be incorporated into the Environmental Management Plan (EMP).

Details of the impact assessment methodology used to determine the significance of physical, biophysical and socio-economic impacts are provided below.

The significance rating process follows the established impact/risk assessment formula:

Significance = Consequence x Probability x Nature

Where

Consequence = Intensity + Extent + Duration

And

Probability = Likelihood of an impact occurring

And

Nature = Positive (+1) or negative (-1) impact

Note: In the formula for calculating consequence, the type of impact is multiplied by +1 for positive impacts and -1 for negative impacts.

The matrix calculates the rating out of 147, whereby intensity, extent, duration and probability are each rated out of seven. The weight assigned to the various parameters is then multiplied by +1 for positive and -1 for negative impacts.

Impacts are rated prior to mitigation and again after consideration of the mitigation has been applied; post-mitigation is referred to as the residual impact. The significance of an impact is determined and categorised into one of eight categories (Table 6-2). The descriptions of the significance ratings are presented in Table 6-3.

It is important to note that the pre-mitigation rating takes into consideration the activity as proposed, (i.e., there may already be some mitigation included in the engineering design). If the specialist determines the potential impact is still too high, additional mitigation measures are proposed.

Table 6-2: Impact Assessment Parameter Ratings

Rating	Intensity/ Replaceability		Extent	Duration/Reversibility	Probability
	Negative Impacts (Nature = -1)	**Positive Impacts (Nature = +1)**			
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 high 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
5	Serious loss and/or damage to biological or physical 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 of 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

Rating	Intensity/ Replaceability		Extent	Duration/Reversibility	Probability
	Negative Impacts (Nature = -1)	**Positive Impacts (Nature = +1)**			
4	Serious loss and/or damage to biological or physical 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 the impact can be reversed with management.	Probable Has occurred here or elsewhere and could therefore occur. < 50% probability
3	Moderate loss and/or damage to biological or physical resources or low to moderately sensitive environments, 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.	Medium Term 1-5 years and the 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 experienced by a small percentage of the baseline.	Limited Limited to the site and its immediate surroundings.	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/ Replaceability		Extent	Duration/Reversibility	Probability
	Negative Impacts (Nature = -1)	**Positive Impacts (Nature = +1)**			
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 common place structures.	Some low-level natural and/or social benefits felt by a very small percentage of the baseline.	Site Specific 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 6-3: Probability/Consequence Matrix

Probability	Significance																																						
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																																							

7. Baseline Environment Description

7.1. Biophysical Environment

The regional topography of the project locality can be described as low relief plains to the south and moderate relief hills & mountainous terrain to the north. The regional elevation ranges from approximately 1 250 mamsl in the valleys to the far north and 1 850 mamsl in the immediate vicinity of the project site. Figure 8-1 provides an overview of the topography surrounding the project site.

The Project Area falls within the Soweto Highveld Grassland vegetation type. The region surrounding the project site is also dominated by grassland vegetation types characteristic of the Grassland Biome which covers the central plateau of South Africa (DWE, 2021b). Figure 8-2 provides an overview of the vegetation types surrounding the project site.

Figure 8-3 provides an overview of the Land Use and Cover (LULC) surrounding the project site. The LULC of the surrounding environment is dominated by agricultural activities to the west and built up (urban, industrial and residential) areas to the east with naturally occurring grassland and shrubland scattered throughout the region. Significant areas of mining-related land cover (TSFs, pits and dumps) can be found towards the south of the project site. Based on a visual interpretation of the LULC in region it may be concluded that the natural environment surrounding the project site has been significantly altered through agricultural activities, urban / residential / industrial development and mining activities.

7.2. Socio-Economic Environment

Based on a 2016 community survey, the MCLM has a population of 838 864 people with the majority of residents (93%) living in urban areas. Situated directly adjacent to the City of Johannesburg Metropolitan Municipality (and financial hub of South Africa), the MCLM economy is well diversified with the largest shares being government and personal services, and manufacturing (Dept. Cooperative Governance, 2019).

The sectors contributing the most to employment in the MCLM are (in order of importance) trade, finance, manufacturing and community services with mining and agriculture being the two smallest employment sectors in the municipality (Dept. Cooperative Governance, 2019). Taking into consideration the high presence of mining activities in the environment surrounding the project site, it is expected that mining would play a slightly more prominent role in the employment in local communities.

7.3. Visual / Aesthetic Character

Based on the information presented in sections 7.1 and 7.2 the visual / aesthetic character of the environment surrounding the site location may be described as largely urban and highly modified. Two key characteristics of the project site and surrounding environment that contribute significantly to its Visual Absorption Capacity (VAC) (i.e. the ability of a landscape

to absorb new elements, without any loss in its visual integrity) in relation to the proposed operations are as follows:

- The MCLM has historically been a key focal point of South Africa's gold-mining sector with mine shafts and TSFs prominent throughout the municipality. It may be argued that mining-related landmarks form a key part of the visual / aesthetic character of the environment.
- At present the site itself is characterised by largely unrehabilitated surfaces and visually intrusive structural elements.

These characteristics should be considered as external mitigatory factors when it comes to the expected intensity of the visual impact of the proposed operations on the surrounding environment.

8. Results

8.1. Categorisation of Visual Impacts

The expected visual impact of the Project was categorised based on the type of receiving environment and the type of development as detailed in Table 8-1 (Oberholzer, 2005). The table provides an indication of the visual impacts that can be expected for different types of developments in relation to the nature of the receiving environment. Following this classification system, the Project is classed as a **Category 5 development**. The receiving environment is best described as an area **of low scenic, cultural or historical significance**. While it may be argued that the immediate mining region could be classified as a disturbed urban area, it must be acknowledged that the zone of influence for the visual impact is expected to extend beyond the immediate mining area, and that the legacy of tailings and dumps across the Mogale region has characterised the area and adds to its sense of place. It is expected that the Project will potentially have a **moderate to high visual impact** on the receiving environment as shown in Table 8-2.

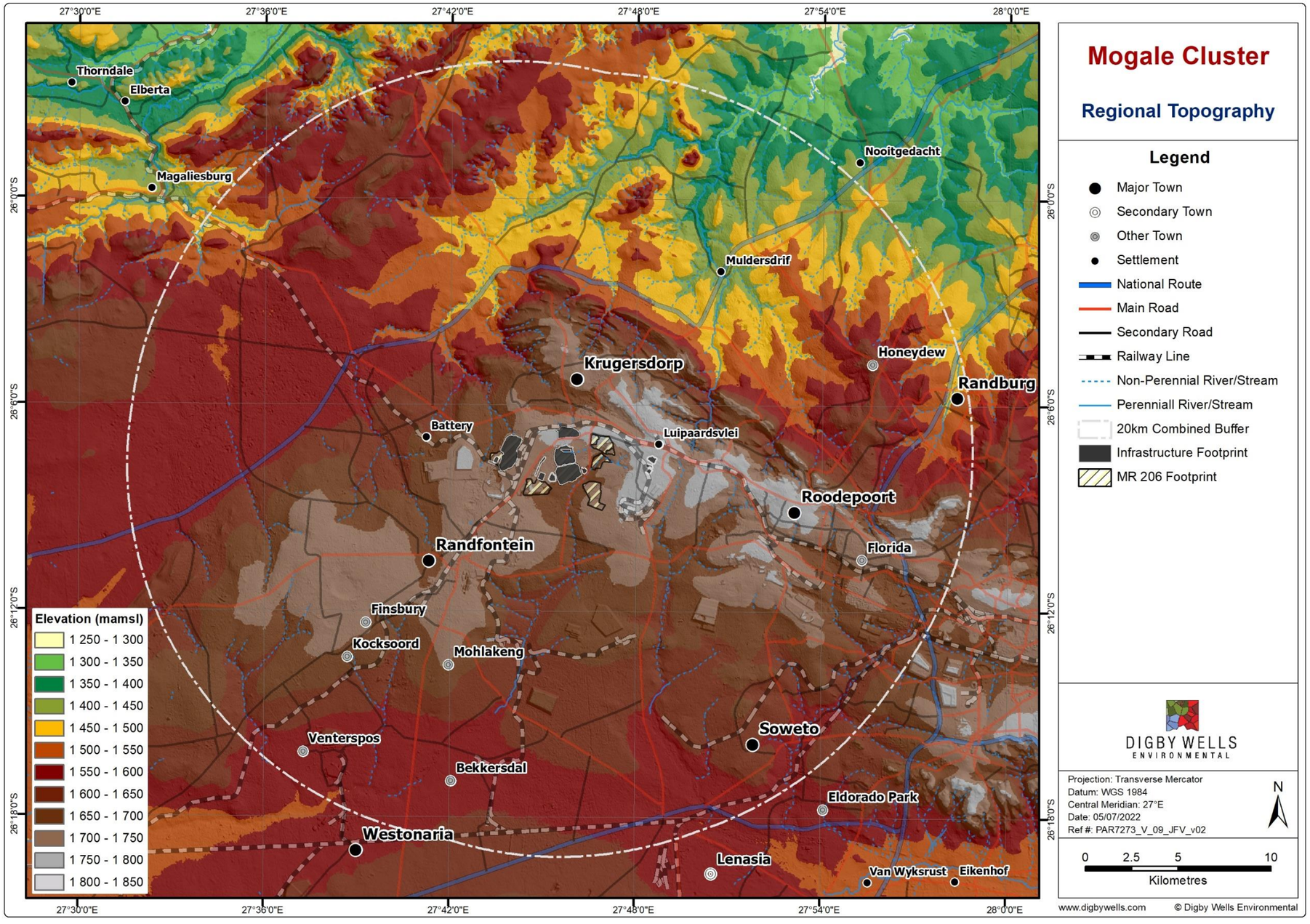

Figure 8-1: Regional Topography

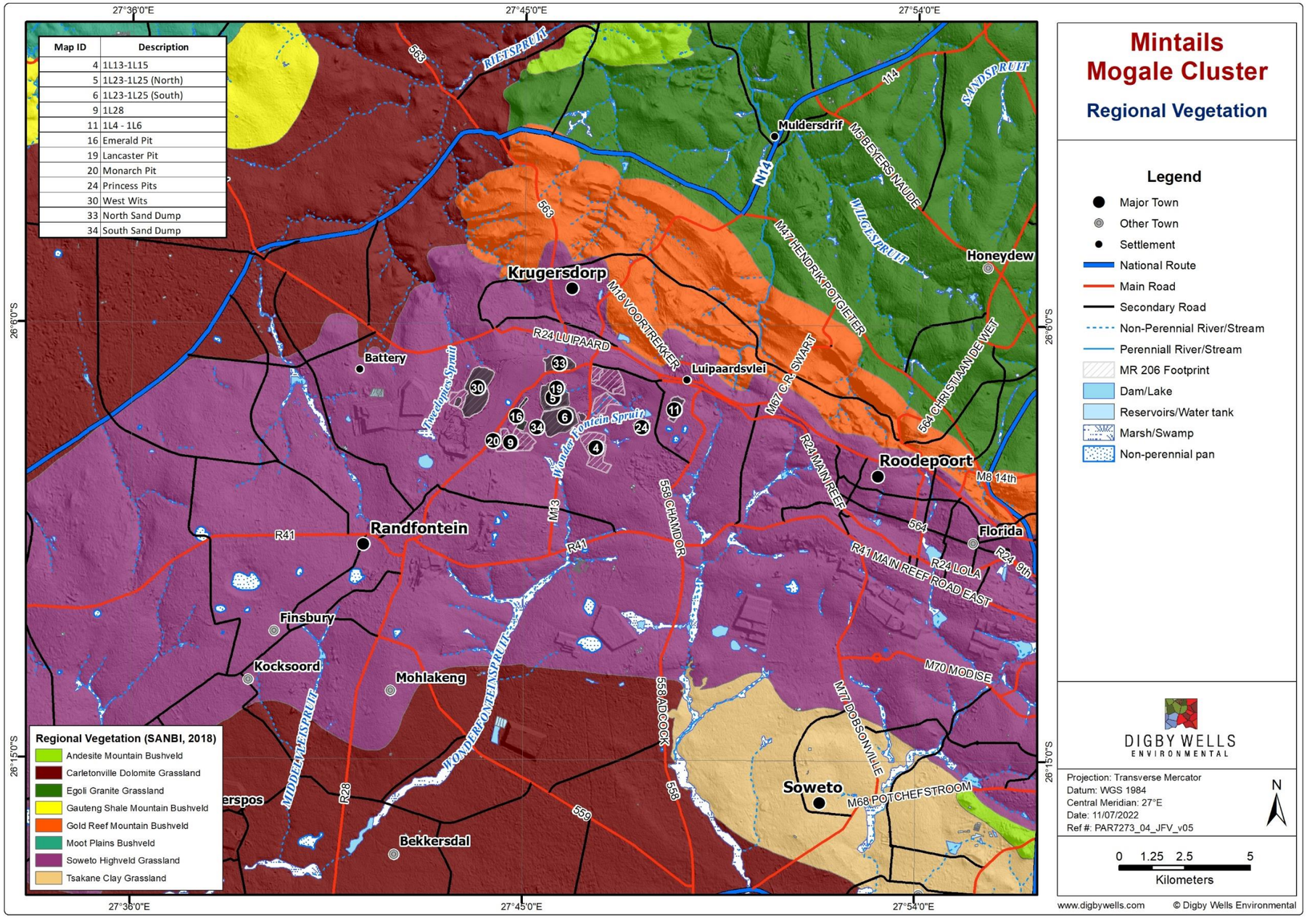

Figure 8-2: Regional Vegetation

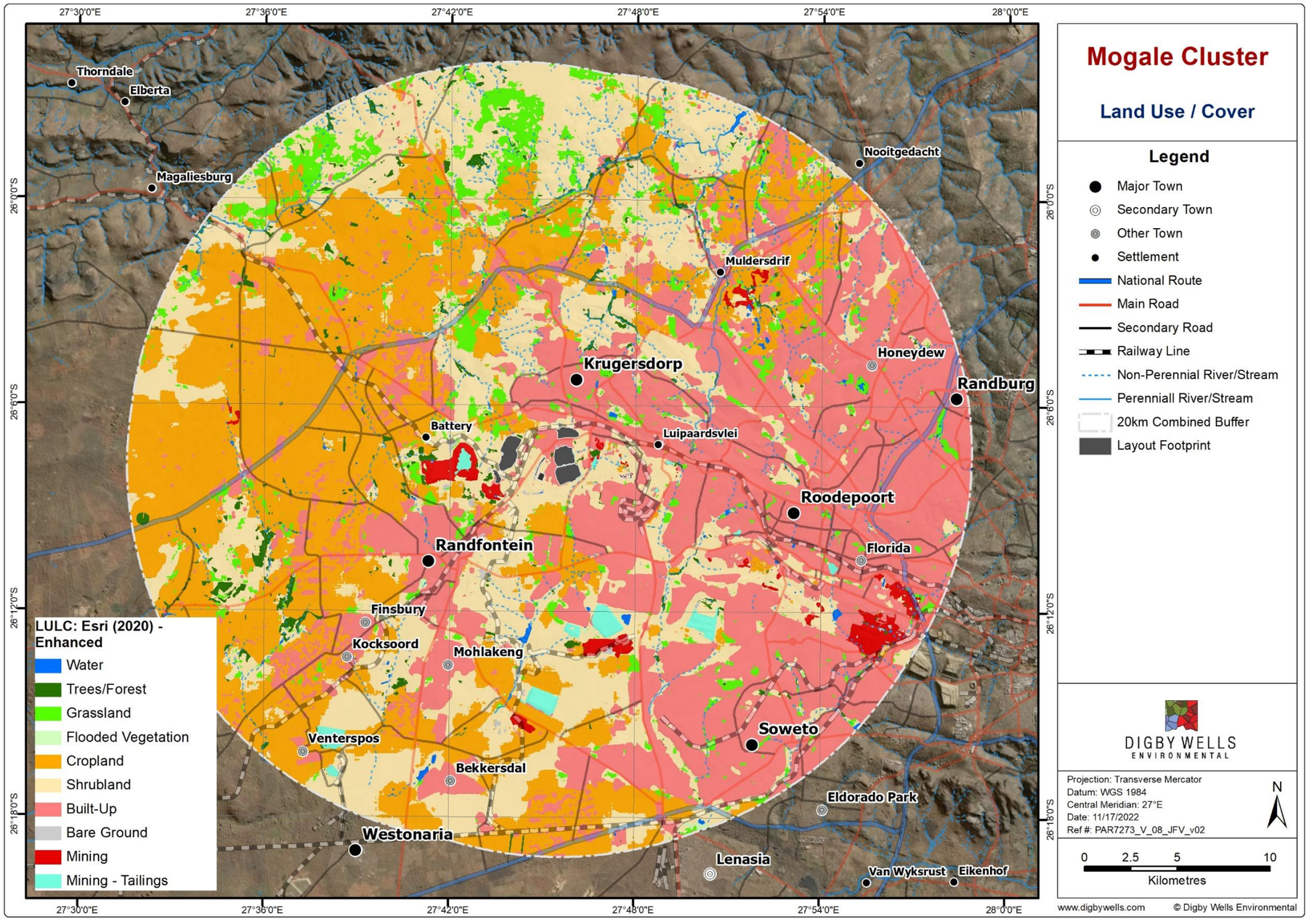

Figure 8-3: Regional Land Use / Cover

Table 8-1: Key to Categorisation of Development (adapted from Oberholzer, 2005)

Type of Development	Examples of Development
Category 1	Nature reserves, nature related recreation, camping, picnicking, trails and minimal visitor facilities.
Category 2	Low-key recreation/resort/residential type development, small-scale agriculture/nurseries, narrow roads and small-scale infrastructure.
Category 3	Low density resort/residential type development, golf or polo estates, low to medium-scale infrastructure.
Category 4	Medium density residential development, sports facilities, small-scale commercial facilities/office parks, one-stop petrol stations, light industry, medium-scale infrastructure.
Category 5	High density township/residential development, retail and office complexes, industrial facilities, refineries, treatment plants, power stations, wind energy farms, power lines, freeways, toll roads, large-scale infrastructure generally. Large-scale development of agricultural land and commercial tree plantations. Quarrying and mining activities with related processing plants.

Table 8-2: Categorisation of Expected Visual Impact (adapted from Oberholzer, 2005)

Type of Environment	Type of Development (Low to High Intensity)				
	Category 1 Development	Category 2 Development	Category 3 Development	Category 4 Development	Category 5 Development
Protected/wild areas of international, national or regional significance	Moderate visual impact expected	High visual impact expected	High visual impact expected	Very high visual impact expected	Very high visual impact expected
Areas or routes of high, scenic, cultural or historical significance	Minimal visual impact expected	Moderate visual impact expected	High visual impact expected	High visual impact expected	Very high visual impact expected

Type of Environment	Type of Development (Low to High Intensity)				
	Category 1 Development	Category 2 Development	Category 3 Development	Category 4 Development	Category 5 Development
Areas or routes of medium scenic, cultural or historical significance	Little or no visual impact expected	Minimal visual impact expected	Moderate visual impact expected	High visual impact expected	High visual impact expected
Areas or routes of low scenic, cultural or historical significance	Little or no visual impact expected. Possible benefits	Little or no visual impact expected	Minimal visual impact expected	Moderate visual impact expected	High visual impact expected
Disturbed or degraded sites/run down urban areas/wasteland	Little or no visual impact expected. Possible benefits	Little or no visual impact expected. Possible benefits	Little or no visual impact expected	Minimal visual impact expected	Moderate visual impact expected

8.2. Receptor Identification

The main objective of the receptor identification component of this assessment was to identify key locations relating to the local communities and visitors from neighbouring municipalities, provinces and abroad - taking into consideration sites such as the Cradle of Humankind World Heritage site and key routes connecting such sites with metropolitan areas such as the City of Johannesburg or Tshwane. These locations were included in the viewshed analysis as receptors. Potential receptors were extracted from a 20km ZVI surrounding the proposed facilities and broken down into (i) population, (ii) transport, and (iii) protected area receptors. The receptors identified through a review of available datasets are listed in Table 8-3 and shown in Figure 8-4.

Table 8-3: Viewshed Receptors

Receptor Category	Receptor	Description
Population	Dwellings (SBC)	379 516 Dwellings within the 20km Buffer Zone
Transport	N14 National Road	48.9km of road running through the north-west of the 20km Buffer Zone
	N1 National Road	17.3km of road running through the east of the 20km Buffer Zone
	N12 National Road	11.4km of road running through the south of the 20km Buffer Zone
Protected Areas	Boschkop Municipal Nature Reserve	4.06 Ha Within 20km Buffer Zone
	Ruimsig Municipal Nature Reserve	13.23 Ha Within 20km Buffer Zone
	Kloofendal Municipal Nature Reserve	120.09 Ha Within 20km Buffer Zone
	Blougat Municipal Nature Reserve	152.90 Ha Within 20km Buffer Zone
	Walter Sisulu National Botanical Garden	286.30 Ha Within 20km Buffer Zone
	Krugersdorp Municipal Nature Reserve	1 351.59 Ha Within 20km Buffer Zone
	Cradle of Humankind World Heritage Site	20 962.57 Ha Within 20km Buffer Zone

8.3. Viewshed Analysis

The results from the viewshed modelling process are presented in this section where individual viewsheds were run to model the potential impact of the most significant infrastructure features.

The viewshed outputs for each of the infrastructure features were overlain with each individual receptor to calculate the percentage visibility and determine its visibility qualification (very low, low, moderate, high, and very high). Tables showing the visibility qualifications relating to each receptor are presented in this section along with the corresponding viewshed maps. More detailed tables containing individual visibility percentages are available in APPENDIX A.

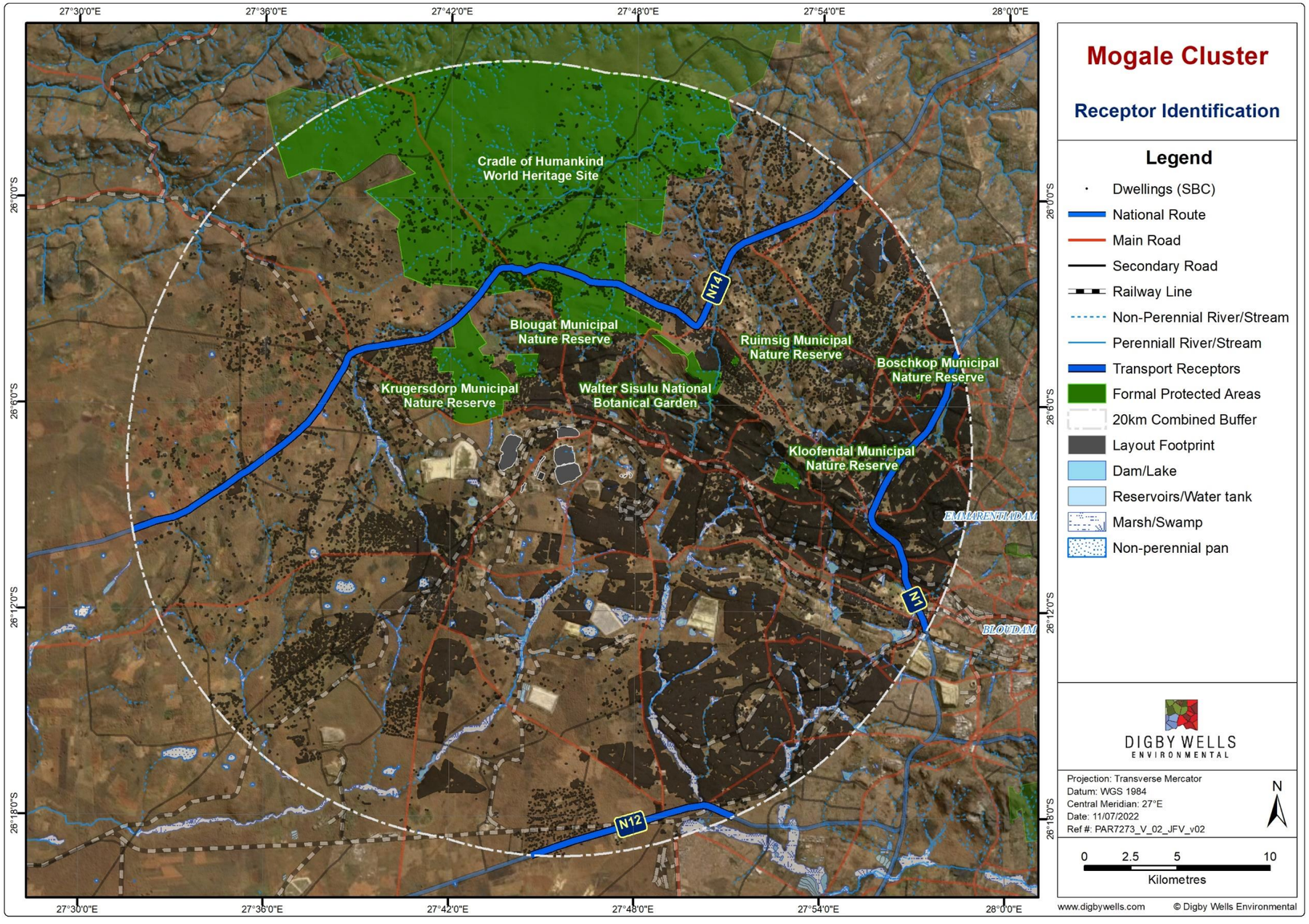

Figure 8-4: Receptor Identification

8.3.1. Viewshed Results: West Wits TSF

The results from the Viewshed Analysis for the proposed West Wits TSF are summarised and presented in Table 8-4 and Figure 8-5.

Table 8-4: West Wits TSF Viewshed Results

West Wits TSF		
Receptor Category	**Receptor**	**Visibility Qualification**
Population	Dwellings (SBC)	High
Transport	N14 National Road	Moderate
	N1 National Road	Zero
	N12 National Road	Zero
Protected Areas	Boschkop Municipal Nature Reserve	Zero
	Ruimsig Municipal Nature Reserve	Zero
	Kloofendal Municipal Nature Reserve	Low
	Blougat Municipal Nature Reserve	Very High
	Walter Sisulu National Botanical Garden	Zero
	Krugersdorp Municipal Nature Reserve	Very High
	Cradle of Humankind World Heritage Site	High

8.3.2. Viewshed Results: 1L23 - 1L25 North

The results from the Viewshed Analysis for the proposed 1L23 - 1L25 (North) TSF are summarised and presented in Table 8-5 and Figure 8-6.

Table 8-5: 1L23 - 1L25 (North) TSF Viewshed Results

1L23 - 1L25 North		
Receptor Category	**Receptor**	**Visibility Qualification**
Population	Dwellings (SBC)	Very High
Transport	N14 National Road	Very Low
	N1 National Road	Zero
	N12 National Road	Low
Protected Areas	Boschkop Municipal Nature Reserve	Zero
	Ruimsig Municipal Nature Reserve	Zero
	Kloofendal Municipal Nature Reserve	Very Low
	Blougat Municipal Nature Reserve	Zero
	Walter Sisulu National Botanical Garden	Zero
	Krugersdorp Municipal Nature Reserve	Very Low
	Cradle of Humankind World Heritage Site	Low

8.3.3. South Viewshed Results: 1L23 - 1L25

The results from the Viewshed Analysis for the proposed 1L23 - 1L25 (South) TSF are summarised and presented in Table 8-6 and Figure 8-7.

Table 8-6: 1L23 - 1L25 (South) TSF Viewshed Results

1L23 - 1L25 South		
Receptor Category	**Receptor**	**Visibility Qualification**
Population	Dwellings (SBC)	Very High
Transport	N14 National Road	Zero
	N1 National Road	Zero
	N12 National Road	Low
Protected Areas	Boschkop Municipal Nature Reserve	Zero
	Ruimsig Municipal Nature Reserve	Zero
	Kloofendal Municipal Nature Reserve	Zero
	Blougat Municipal Nature Reserve	Zero
	Walter Sisulu National Botanical Garden	Zero
	Krugersdorp Municipal Nature Reserve	Zero
	Cradle of Humankind World Heritage Site	Zero

8.3.4. Viewshed Results: Preferred Plant Area

The results from the Viewshed Analysis for the proposed Preferred Plant Area are summarised and presented in Table 8-7 and Figure 8-8.

Table 8-7: Preferred Plant Area Viewshed Results

Preferred Plant Area		
Receptor Category	**Receptor**	**Visibility Qualification**
Population	Dwellings (SBC)	Very High
Transport	N14 National Road	Zero
	N1 National Road	Zero
	N12 National Road	Zero
Protected Areas	Boschkop Municipal Nature Reserve	Zero
	Ruimsig Municipal Nature Reserve	Zero
	Kloofendal Municipal Nature Reserve	Zero
	Blougat Municipal Nature Reserve	Zero
	Walter Sisulu National Botanical Garden	Zero
	Krugersdorp Municipal Nature Reserve	Zero
	Cradle of Humankind World Heritage Site	Zero

8.3.5. Viewshed Results: Combined

The results from the combined Viewshed Analysis are summarised and presented in Table 8-8 and Figure 8-9. It should be noted that the overall visibility of the most significant infrastructure elements (i.e. the West Wits and 1L-25 (North) TSFs) associated with the operation cannot be mitigated by the lower visibility of less prominent features. The viewshed shown in Figure 8-9 should therefore be interpreted as a “worst case scenario” as opposed to an average across all the viewshed results.

The combined viewshed results show that, in general, the proposed activities are expected to have a very high visibility to the surrounding population, a low visibility from the identified transport receptors and a high visibility from the identified protected area-receptors.

The proposed West Wits TSF is expected to have the highest visibility across all the different receptors and, thereby, the highest expected visual impact. This is likely due to the lack of topographic screening to the north-east. The 1L23 – 1L25 (North) TSF is expected to have the second highest visibility of the proposed infrastructure due to its height (in comparison with

its southern counterpart and the preferred plant area), however, with more topographical screening to the north-east. The 1L23 – 1L25 TSF (South) and Preferred Plant area are expected to have a low-to-zero visibility to transport and protected area receptors and are expected to be highly visible to the population in the immediate surroundings of the project site (as is the case for all the proposed infrastructure).

Table 8-8: Combined Viewshed Results

Combined		
Receptor Category	**Receptor**	**Visibility Qualification**
Population	Dwellings (SBC)	Very High
Transport	N14 National Road	Moderate
	N1 National Road	Zero
	N12 National Road	Very Low
Protected Areas	Boschkop Municipal Nature Reserve	Zero
	Ruimsig Municipal Nature Reserve	Zero
	Kloofendal Municipal Nature Reserve	Very Low
	Blougat Municipal Nature Reserve	High
	Walter Sisulu National Botanical Garden	Zero
	Krugersdorp Municipal Nature Reserve	Very High
	Cradle of Humankind World Heritage Site	High

8.3.6. Cumulative Visibility

Figure 8-10 below shows the binary (visible vs not visible) viewsheds for:

- The most prominent features at the site at baseline conditions (i.e. the existing 1L23-25 TSF, sand dumps and waste rock dumps surrounding the current West Wits Pit)
- The proposed infrastructure elements.

A comparison of these viewshed outputs indicate that the infrastructure elements present at baseline conditions are visible from 82.74% (32,411 ha) of the area from which the proposed

infrastructure elements would be visible. The increase in the cumulative visibility resulting from the proposed operations is therefore 17.26% (6,761 ha).

The cumulative visibility described here should be taken into consideration when it comes to the extent-component of the visual impact of the proposed operations.

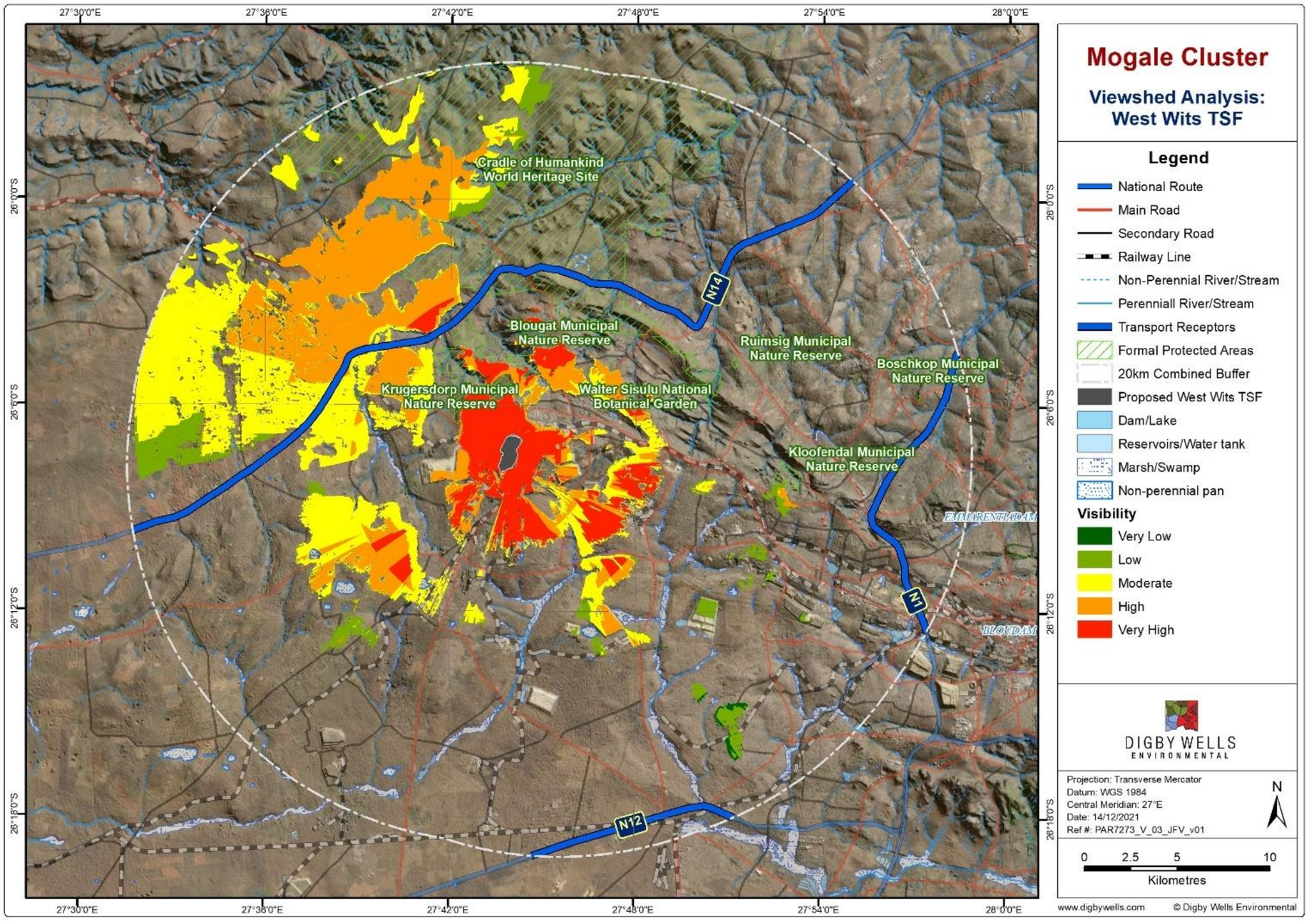

Figure 8-5: Viewshed Results: West Wits TSF

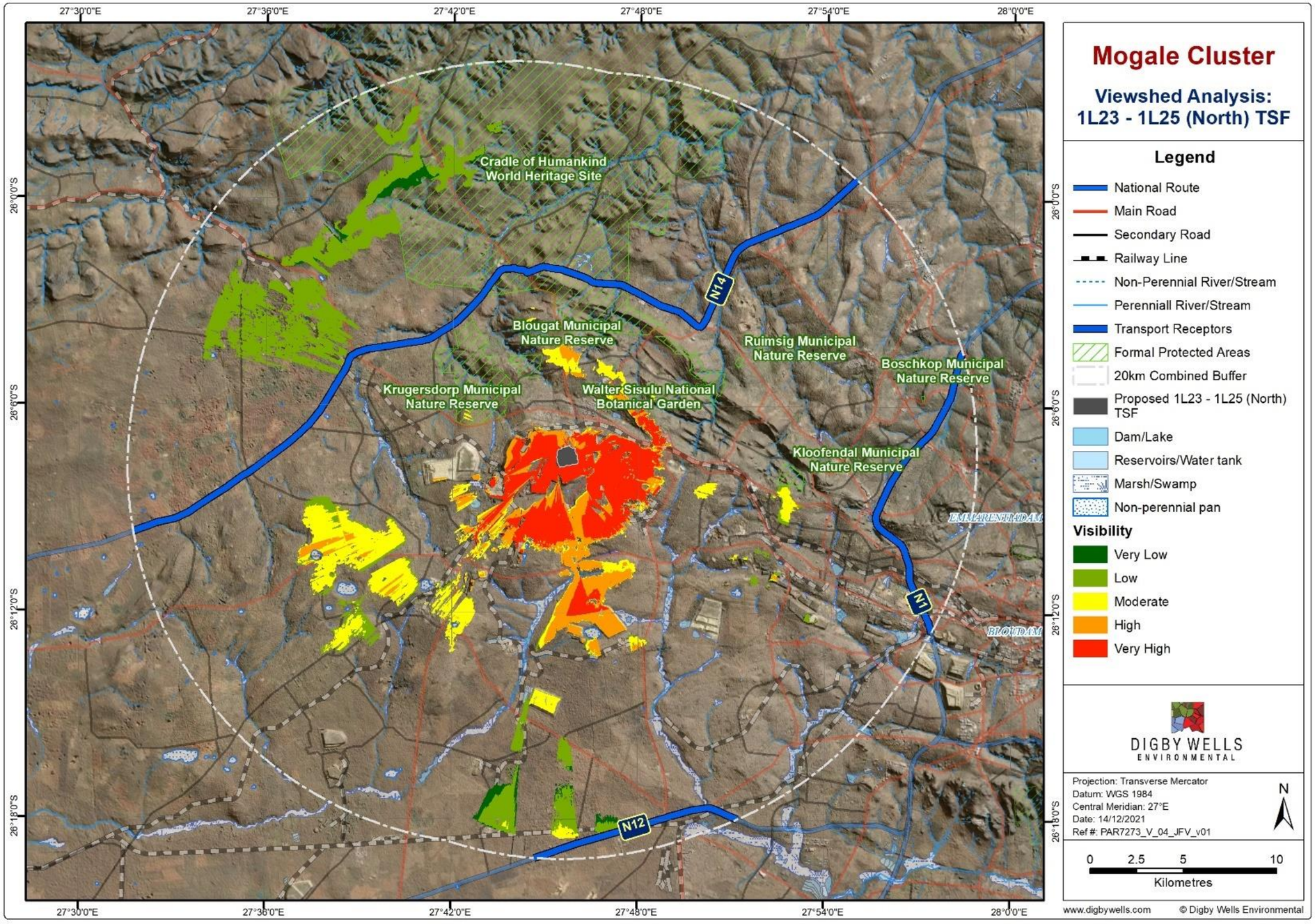

Figure 8-6: Viewshed Results: 1L23 - 1L25 (North) TSF

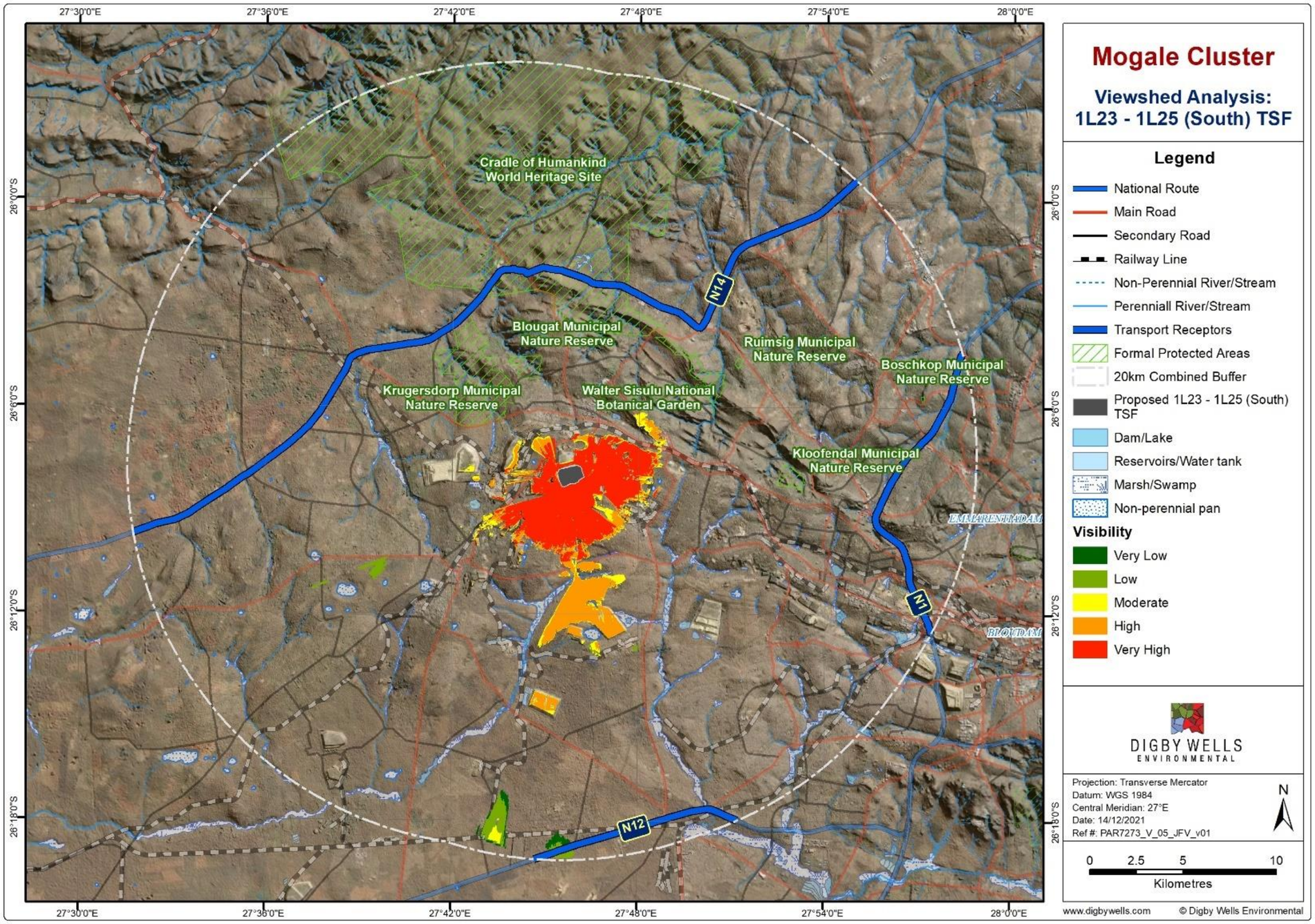

Figure 8-7: Viewshed Results: 1L23 - 1L25 (South) TSF

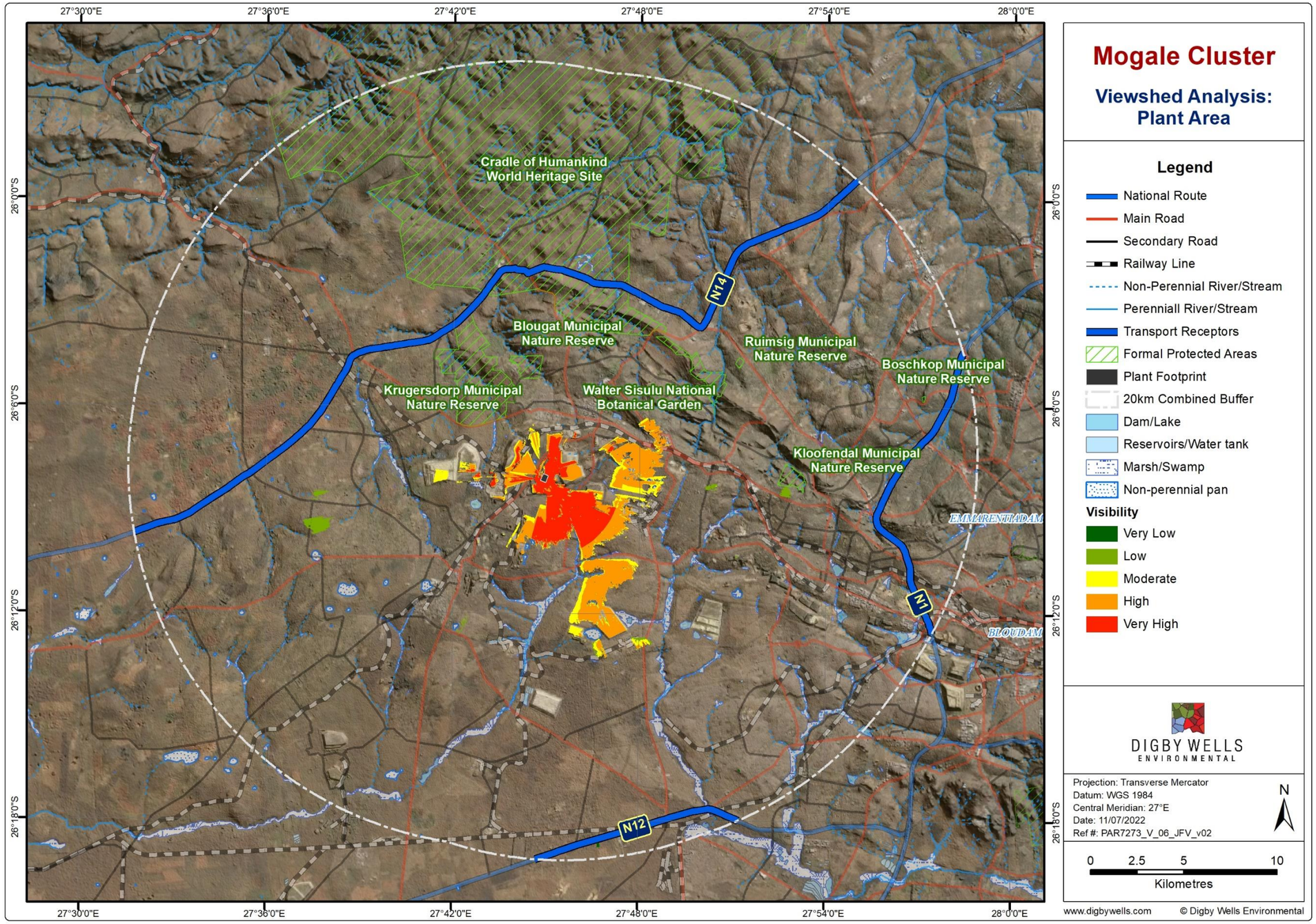

Figure 8-8: Viewshed Results: Plant

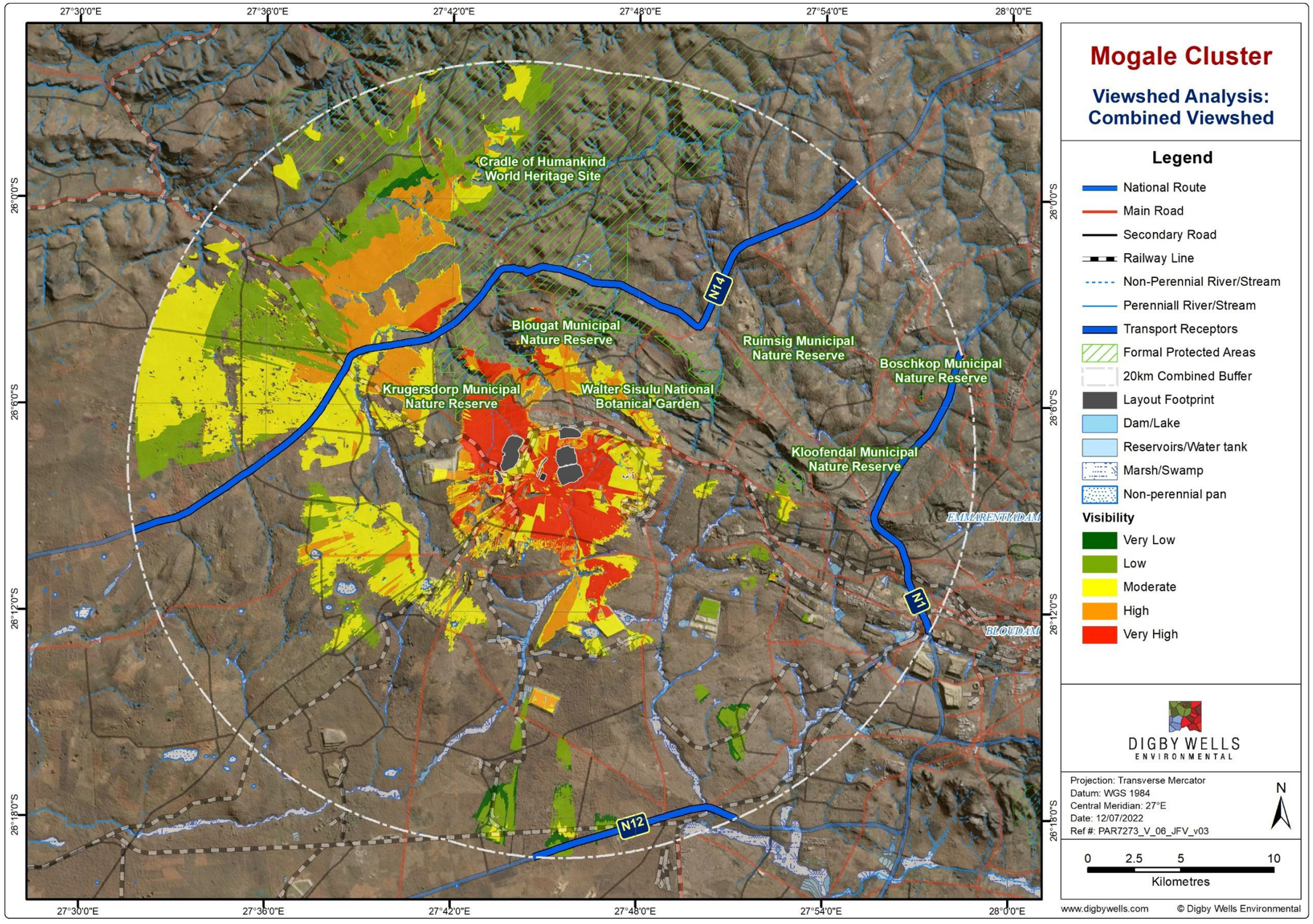

Figure 8-9: Viewshed Results: Combined

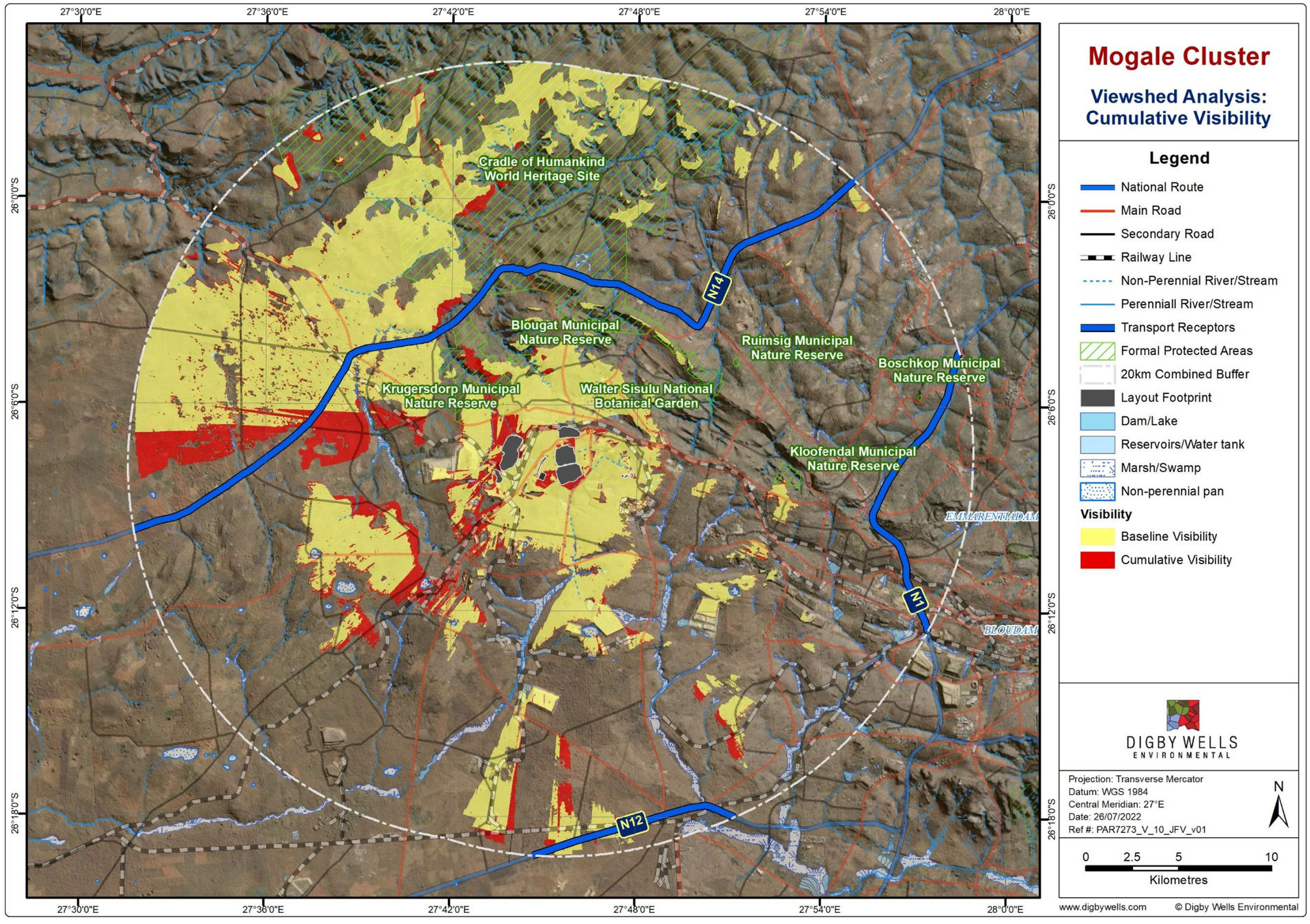

Figure 8-10: Cumulative Visibility

9. Impact Assessment

The Project activities and infrastructure will be rated according to the visual impact they will have on the receiving environment, i.e. the environment before potential development. Negative visual impacts decrease the visual character of the pre-development environment. Neutral visual impacts assist to minimise the negative visual impacts of a development but do not result in a positive visual impact. A positive visual impact only occurs when an area is rehabilitated to a state that is better than the state of the pre-development environment, e.g. an infrastructure project area on previously agricultural land is rehabilitated to an area of natural vegetation and all visible signs of agriculture and infrastructure are removed. Positive visual impacts may only occur during the decommissioning and closure phase.

Although not specifically mentioned in the sections to follow, the following factors will be taken into consideration throughout the impact assessment:

- The external mitigatory factors relating to the baseline environment and outlined in Section 7.3;
- The relatively low increase in cumulative visibility from baseline conditions to the establishment of proposed infrastructures described in Section 8.3.6.

9.1. Construction Phase

Activities during the construction phase that may have potential visual impacts are as follows:

- Site clearing for the construction of the new TSF, plant and ancillary infrastructure such as pipelines, pump stations, electrical supply etc.
- Construction of the new TSF, plant and abovementioned ancillary infrastructure.

The anticipated visual impacts of both site-clearing and construction activities are aimed at minimising the extent to which these activities will be visible towards receptors within the ZVI by (i) limiting activities do the immediate footprints of the various infrastructure types, and (ii) using a phased approach to minimise visibility at given points in time throughout the construction phase. Given that site clearing and construction activities are expected to have similar visual impacts with the same mitigation measures proposed, these impacts are addressed together and presented in Table 9-1 below.

Table 9-1: Impact Ratings - Construction Phase

Dimension	Rating	Motivation	Significance
Site Clearing for Proposed Infrastructure Development			
Impact Description: Visuals impacts associated with the construction of the new TSF, plant and ancillary infrastructure such as pipelines, pump stations, electrical supply etc.			
Prior to Mitigation/Management			

Dimension	Rating	Motivation	Significance
Site Clearing for Proposed Infrastructure Development			
Duration	3	Site clearing activities and the construction of the proposed plant (and ancillary infrastructure), the West Wits TSF and additional TSF alternative sites is expected to take place during the first six years of the proposed development.	Minor (negative) -49
Extent	2	Although the visual impact of site clearing and construction activities is likely extend beyond the site, the extent of the impact is limited when taking into consideration the effect of cumulative visibility.	
Intensity	2	Minor impact on the visual aesthetic character within the visible region of the receiving environment due to the locations already-altered state.	
Probability	7	The development of the mine infrastructure is necessary in order to operate the mining operation.	
Nature	*Negative*		
Mitigation/Management Actions			
Ensure that any site clearing activities are limited to the immediate footprints of the proposed infrastructure to minimise visual impacts (dust generation, high-contrasting surfaces, etc).			
Consider a phased construction approach to various infrastructure areas to minimise the visibility of the different infrastructure developments at specific points in time. It must be noted that a phased construction approach is likely to impact on the duration of the development.			
Post-Mitigation			
Duration	3	The duration cannot be mitigated - This is an operational requirement.	Minor (negative) -42

Dimension	Rating	Motivation	Significance
Site Clearing for Proposed Infrastructure Development			
Extent	1	The mitigation measures proposed above are likely to result in the lowering of the visual impact by reducing the extent of the activities.	
Intensity	2	By adopting a phased construction approach, the intensity can be reduced.	
Probability	7	While mitigation measures are suggested, the probability remains unchanged with site clearing and infrastructure construction are essential for the operation of the mine.	
Nature	*Negative*		

9.2. Operational Phase

Activities during the operational phase that may have potential visual impacts are as follows:

- Operations relating to the proposed plant and ancillary infrastructure:
  - Operation of pump stations during the operational phase;
  - Maintenance of pipeline routes during the operational activities;
  - Production of Gold;
  - Employment and procurement for operational related activities.
- West Wits TSF:
  - Tailings Deposition into the existing West Wits Pit;
  - Development and Operation of the proposed TSF.
- 1L23-1L25 TSF (North and South):
  - Hydraulic reclamation of the associated historic tailings facilities and sand dumps;
  - Tailings deposition onto the historic footprint of 1L23-1L25.

The visual impacts expected to arise from the operational phase activities are presented in Tables 9-2 to 9-5 below.

Table 9-2: Impact Ratings (Operational Phase) - Plant Area and Ancillary Infrastructure

Dimension	Rating	Motivation	Significance
Operations surrounding to the proposed plant and ancillary infrastructure			
Operation of pump stations during the operational phase; *Maintenance of pipeline routes during the operational activities;* *Production of Gold;* *General Operational activities.*			
Prior to Mitigation/Management			
Duration	6	The plant is an operational requirement and will exist throughout the operation of the mine.	Minor (negative) -70
Extent	2	The visual impact of the plant area and general operations is mostly limited to the immediate surroundings of the site where there is a high density of population receptors. The overall visibility through the zone of visual influence, however, is very low and limited to the south of the site due to visual screening by other proposed facilities. Taking into consideration the effect of cumulative visibility the extent of the impact is limited.	
Intensity	2	The expected visibility of the plant and ancillary infrastructure is expected to be significantly lower than the proposed TSFs and therefore result in a significantly lower relative intensity.	
Probability	7	The development of the mine infrastructure is necessary in order to operate the mining operation.	
Nature	*Negative*		
Mitigation/Management Actions			
The effective usage and placement of berms or vegetated screens around the plant infrastructure will mitigate some of the visual impact to the surrounding community.			

Dimension	Rating	Motivation	Significance
The intensity of the plant's visual impact can be reduced slightly by utilising neutral colours that allow for more effective visual absorption.			
Post-Mitigation			
Duration	6	The duration cannot be mitigated - This is an operational requirement.	Minor (negative) -56
Extent	1	The mitigation measures proposed above are likely to result in the lowering of the extent of the visual impact by reducing the visibility of plant infrastructure to the surrounding community.	
Intensity	1	The mitigation measures proposed above are likely to result in a lowering of the intensity of the visual impact by improving the visual absorption associated with plant infrastructure.	
Probability	7	While mitigation measures are suggested, the probability remains unchanged with general operational activities described above remaining essential for the functioning of the mine.	
Nature	*Negative*		

Table 9-3: Impact Ratings (Operational Phase) - Proposed West Wits TSF

Dimension	Rating	Motivation	Significance
Operational Aspects of the Proposed West Wits TSF			
Development and Operation of the proposed TSF; *Tailings Deposition into the existing West Wits Pit.*			
Prior to Mitigation/Management			
Duration	6	The TSF is an operational requirement and will exist throughout the operation of the mine.	Moderate (negative) -77

Dimension	Rating	Motivation	Significance
Extent	2	Although The West Wits TSF is expected to have a moderate -to-high visibility from all identified receptors and the highest overall visibility of all the proposed infrastructure, the extent of the impact is limited when taking into consideration the effect of cumulative visibility.	
Intensity	3	As the most prominent features in the mine design, the TSF would typically have a high intensity visual impact. The high presence of TSF and other mining-related landforms within the immediate environment, however, may be considered a major mitigatory factor..	
Probability	7	The development of the TSF is necessary for the operation of the mine.	
Nature	*Negative*		
Mitigation/Management Actions			
The application of planned in-situ rehabilitation on the West Wits TSF.			
Ensuring that any operational phase site clearing activities are limited to the immediate footprints of the proposed infrastructure to minimise visual impacts (dust generation, high-contrasting surfaces, etc).			
The effective use of on-site screening mechanisms (e.g. berms) may act in reducing the visibility of the TSF to local communities in the immediate surroundings. It should be noted that such mechanisms would not reduce visibility to road and protected area receptors and would arguably have a minimal mitigatory impact on the visual character of the immediate surroundings due to the high presence of existing mining-related landforms that form part of the local visual character.			
Post-Mitigation			

Dimension	Rating	Motivation	Significance
Duration	6	The duration cannot be mitigated - This is an operational requirement.	Minor (negative) -63
Extent	1	Although the effective use of screening mechanisms are not expected to reduce the visibility of the TSF to Road and Protected Area receptors, it is likely to reduce the visibility thereof to immediately surrounding communities.	
Intensity	2	The expected intensity of the visual impact of the TSF is already reduced due to the current visual character if the surrounding environment and the planned progressive rehabilitation activities. The effective use of screening mechanisms may reduce direct visibility to the population receptors in the immediate environment..	
Probability	7	While mitigation measures are suggested, the development of the TSF remains necessary for the operation of the mine.	
Nature	*Negative*		

Table 9-4: Impact Ratings (Operational Phase) - Proposed 1L23-1L25 (North) TSF

Dimension	Rating	Motivation	Significance
Operational Aspects of the Proposed 1L23-1L25 (North) TSF			
Development and Operation of the proposed TSF; *Tailings Deposition into the existing 1L23 – 1L25 (North).*			
Prior to Mitigation/Management			

Dimension	Rating	Motivation	Significance
Duration	6	The TSF is an operational requirement and will exist throughout the operation of the mine	Moderate (negative) -77
Extent	2	Although the 1L23 – 1L25 (North) TSF is expected to be moderately visible from identified receptors and the second highest overall visibility of all the proposed infrastructure, the extent of the impact is limited when taking into consideration the effect of cumulative visibility.	
Intensity	3	As one of the one of the most prominent features in the mine design, the TSF would typically have a high intensity visual impact. The high presence of TSF and other mining-related landforms within the immediate environment, however, may be considered a major mitigatory factor.	
Probability	7	The development of the TSF is necessary for the operation of the mine.	
Nature	*Negative*		
Mitigation/Management Actions			
The application of planned in-situ rehabilitation on the 1L23 – 1L25 (North) TSF.			
Ensuring that any operational phase site clearing activities are limited to the immediate footprints of the proposed infrastructure to minimise visual impacts (dust generation, high-contrasting surfaces, etc).			
The effective use of on-site screening mechanisms (e.g. berms) may act in reducing the visibility of the TSF to local communities in the immediate surroundings. It should be noted that such mechanisms would not reduce visibility to road and protected area receptors and would arguably have a minimal mitigatory impact on the visual character of the immediate surroundings due to the high presence of existing mining-related landforms that form part of the local visual character.			

Dimension	Rating	Motivation	Significance
Post-Mitigation			
Duration	6	The duration cannot be mitigated - This is an operational requirement.	Moderate (negative) -63
Extent	1	Although the effective use of screening mechanisms are not expected to reduce the visibility of the TSF to Road and Protected Area receptors, it is likely to reduce the visibility thereof to immediately surrounding communities.	
Intensity	2	The expected intensity of the visual impact of the TSF is already reduced due to the current visual character if the surrounding environment and the planned progressive rehabilitation activities. The effective use of screening mechanisms may reduce direct visibility to the population receptors in the immediate environment. .	
Probability	7	While mitigation measures are suggested, the development of the TSF remains necessary for the operation of the mine.	
Nature	*Negative*		

Table 9-5: Impact Ratings (Operational Phase) - Proposed 1L23-1L25 (South) TSF

Dimension	Rating	Motivation	Significance
Operational Aspects of the Proposed 1L23-1L25 (South) TSF			
Development and Operation of the proposed TSF; *Tailings Deposition into the existing 1L23 – 1L25 (South).*			
Prior to Mitigation/Management			

Dimension	Rating	Motivation	Significance
Duration	6	The TSF is an operational requirement and will exist throughout the operation of the mine	Minor (negative) -70
Extent	2	The 1L23 – 1L25 (South) TSF is expected to have a low-to-very low visibility to identified receptors except for population receptors in the immediate vicinity.	
Intensity	2	The proposed 1L23-1L25 (South) TSF is one of the less prominent features within the planned layout. Almost completely screened to the north and not being visible to the majority of receptors, the TSF is expected to have a minor intensity impact. In addition, factors such as the low expected visual intrusion on the existing landscape and planned progressive rehabilitation approach is expected to further reduce the intensity of its visual impact.	
Probability	7	The development of the TSF is necessary for the operation of the mine.	
Nature	*Negative*		
Mitigation/Management Actions			
The application of planned in-situ rehabilitation on the 1L23 – 1L25 (North) TSF.			
Ensuring that any operational phase site clearing activities are limited to the immediate footprints of the proposed infrastructure to minimise visual impacts (dust generation, high-contrasting surfaces, etc).			
The effective use of on-site screening mechanisms (e.g. berms) may act in reducing the visibility of the TSF to local communities in the immediate surroundings. It should be noted that such mechanisms would not reduce visibility to road and protected area receptors and would arguably have a minimal mitigatory impact on the visual character of the immediate surroundings due to the high presence of existing mining-related landforms that form part of the local visual character.			

Dimension	Rating	Motivation	Significance
Post-Mitigation			
Duration	6	The duration cannot be mitigated - This is an operational requirement.	Minor (negative) -63
Extent	1	The extent of the visibility of the 1L23-1L25 (South) TSF is already relatively low compared to other proposed infrastructure. Effective visual screening mechanisms would reduce the extent of visibility even further.	
Intensity	2	The expected intensity of the visual impact of the TSF is already reduced due to the current visual character of the surrounding environment and the planned progressive rehabilitation activities. The effective use of screening mechanisms may reduce direct visibility to the population receptors in the immediate environment.	
Probability	7	While mitigation measures are suggested, the development of the TSF remains necessary for the operation of the mine.	
Nature	*Negative*		

9.3. Decommissioning and Closure

Visual Impacts associated with decommissioning and closure activities are assessed by comparing the visual impacts at baseline conditions with the expected visual impacts thereof after the implementation of recommended closure and rehabilitation measures as outlined in DWE (2021a).

The expected visual impacts at baseline conditions result from the visibility of existing unvegetated TSFs, Waste Rock Dumps, and visually intrusive Infrastructure Elements.

The closure and rehabilitation measures outlined in the DWE (2021a) have been developed to meet a stable and sustainable end state post-mining and may be summarised as follows:

- Removal of buildings, concrete structures and any other infrastructure;

- Levelling and shaping of rehabilitated areas; and
- *In situ* rehabilitation of TSFs and Sand Dumps.

The expected visual impacts associated with the Decommissioning and Closure phase are presented in Table 9-6.

Table 9-6: Impact Ratings: Decommissioning and Closure

Dimension	Rating	Motivation	Significance
Visual Impacts: Baseline Conditions			
Visibility of existing unvegetated TSFs, Waste Rock Dumps, and visually intrusive Infrastructure Elements.			
Prior to Mitigation/Management			
Duration	6	TSFs, Sand Dumps, Waste Rock Dumps are present at baseline conditions as well as the commencement of closure & rehabilitation activities and are expected to be permanent landscape fixtures indefinitely.	Moderate (negative) -77
Extent	3	The extent of prominent features at baseline conditions is moderate-to-relatively high throughout the ZVI.	
Intensity	2	The intensity of visual impacts at baseline conditions is minor considering the current visual & aesthetic character of the surrounding environment.	
Probability	7	Baseline conditions refer to the current characteristics of the site and receiving environment. Probability remains unchanged.	
Nature	*Negative*		
Mitigation/Management Actions			

Dimension	Rating	Motivation	Significance
Removal of buildings, concrete structures, and any other infrastructure;			
Levelling and shaping of rehabilitated areas;			
In situ rehabilitation of TSFs and Sand Dumps;			
Decommissioning & Closure: *Post-Mitigation*			
Duration	6	The duration cannot be mitigated - The TSFs are expected to be permanent landscape features post - decommissioning and closure.	Minor (Positive) 63
Extent	1	The removal of buildings and concrete structures are expected to result in a slight reduction in overall visibility and an improvement to visual absorption. Taking into consideration the effect of cumulative visibility, the extent of the visual impact is very limited.	
Intensity	1	Considering the characteristics of the site under baseline conditions, the implementation of the above mitigation/management actions is expected to result in a positive visual impact..	
Probability	7	The probability remains unchanged.	
Nature	*Positive*		

10. Conclusions & Recommendations

10.1. Visual/Aesthetic Character

The visual / aesthetic character of the environment surrounding the proposed operation may be described as largely urban and highly modified. In addition, the MCLM has historically been a key focal point of South Africa's gold-mining sector with mine shafts and TSFs prominent throughout the municipality. It may be argued that mining-related landmarks form a key part

of the visual / aesthetic character of the environment and that the area has a very high visual absorption capacity for the proposed operation.

10.2. Visibility

Potential sensitive receptors within the 20km ZVI surrounding the proposed facilities were identified based on available data. The receptors identified include: (i) population receptors comprised of dwellings contained within the Eskom Spot Building count, (ii) transport receptors, i.e. the N1, N12 and N14 national highways, and a number of (iii) protected area receptors including the Walter Sisulu National Botanical Gardens and the Cradle of Humankind World Heritage Site.

The overall visibility of the infrastructure elements to the potential sensitive receptors is largely determined by the visibility of the most prominent feature, in this case, the proposed West Wits TSF. The West Wits TSF is expected to be highly visible from the surrounding population, moderately visible from the N14 national highway and highly visible from three of the protected areas (including the Cradle of Humankind World Heritage Site). The 1L23 - 1L25 (North) TSF is expected to exhibit the second-highest visibility to potential sensitive receptors, with a very high expected visibility from the population receptors and a zero, low and very low expected visibility from the remaining ten receptors. The expected visibility associated with the remainder of the infrastructure elements is generally zero with the exception of the population surrounding the proposed operations.

A comparison of the modelled visibility of the site under baseline conditions and the overall visibility footprint of the proposed infrastructure elements indicate that the infrastructure elements present at baseline conditions are visible from 82.74% of the area from which the proposed infrastructure elements would be visible. The increase in the cumulative visibility resulting from the proposed operations is therefore 17.26%.

10.3. Visual Impact

Mainly driven by the duration and probability of the infrastructure elements considered in this assessment and the fact that neither of these components can be changed, the visual impact of the proposed operations during the operational phase is expected to be **minor-negative**.

The extent of the visual impacts of the proposed operations is significantly reduced throughout the impact assessment owing to the relatively low contribution of the proposed infrastructure elements to the cumulative visibility of the elements at the site. In all cases the extent was found to be limited.

Two key external mitigatory factors that play a role in reducing the expected visual impacts across all the infrastructure elements. These are as follows:

- The current visual / aesthetic character of the surrounding environment of which mining related infrastructure forms a significant part.

- The site itself is characterised by largely unrehabilitated surfaces and visually intrusive structural elements.

Taking into consideration the visual/aesthetic character of the surrounding environment and the baseline conditions at the site it is expected that the measures proposed in DWE (2021a) (and included in this impact assessment as potential mitigation measures) would result in a **minor-positive** visual impact at the conclusion of the decommissioning and closure phase.

10.4. Recommendations

Mitigation measures are proposed throughout the impact assessment section of this report. These are as follows:

- The establishment of visual screening mechanisms surrounding the infrastructure elements to reduce visibility from the immediately surrounding population;
- The use of neutral colours for plant-infrastructure to increase visual absorption by the surrounding environment;
- Limiting site clearing activities to the immediate footprints of the proposed infrastructure elements;
- The implementation of the following closure and rehabilitation measures outlined in the DWE (2021a):
    - Removal of buildings, concrete structures, and any other infrastructure;
    - Levelling and shaping of rehabilitated areas; and
    - In situ rehabilitation of TSFs and Sand Dumps.

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