Randfontein Estates Limited

HARMONY WEST WITS RECLAMATION PROJECT

LANDSCAPE & VISUAL IMPACT ASSESSMENT

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ENVIRONMENTAL PLANNING AND DESIGN

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1 INTRODUCTION

1.1 GENERAL

Randfontein Estates Limited (a subsidiary of Harmony Gold Mining Company) (hereafter referred to as the applicant) has appointed Environmental Impact Management Services (Pty) Ltd (EIMS) as the Environmental Assessment Practitioner (EAP) to assist with undertaking the required authorisation processes and to compile and submit the required documentation in support of application for the proposed new Deelkraal II Tailings Storage Facility (TSF) project and associated infrastructure on a site located approximately 13km southwest of Carletonville in the Merafong City Local Municipality, West Rand District Municipality, Gauteng Province (i.e. the Proposed Harmony West Wits Reclamation and Deposition Project).

This Landscape and Visual Impact Assessment (LVIA) study forms part of the application for environmental authorisation being prepared by EIMS, for the applicant.

1.2 PROJECT LOCATION

The proposed project including necessary pipelines, powerlines and deposition area extends from approximately 3.4km south of Carletonville (26°23'54.91345"S; 27°25'51.6797"E) to approximately 14.20km south-west of Carletonville (26°28'21.8382"S; 27°16'55.4888"E) in the Gauteng Province.

1.3 BACKGROUND OF SPECIALIST

Jon Marshall qualified as a Landscape Architect in 1978. He became a Chartered Member of the Landscape Institute (UK) in 1986. He is also a registered Landscape Architect (SACLAP)and has extensive experience of environmental impact assessment in South Africa.

During the early part of his career (1981 – 1990) he worked with Clouston (now RPS) in Hong Kong and Australia. During this period he was called on to undertake visual impact assessment input to numerous environmental assessment processes for major infrastructure projects. This work was generally based on photography with line drawing superimposed to illustrate the extent of development visible.

He worked in the United Kingdom (1990 – 1995) for major supermarket chains including Sainsbury's and prepared CAD based visual impact assessments for public enquiry for new store development. He also prepared the VIA input to the environmental statement for the Cardiff Bay Barrage for consideration by the UK Parliament in the passing of the Barrage Bill (1993).

His more recent VIA work in Africa (1995 to present) includes a combination of CAD and GIS based work for a new international airport to the north of Durban, new heavy industrial operations, overhead electrical transmission lines, mining operations, a number of commercial and residential developments as well as numerous renewable energy projects.

A brief CV is attached for information (**Appendix I**).

1.4 BRIEF AND RELEVANT GUIDELINES

The brief is to assess the landscape and visual impact of the proposed project.

The requirement for this were highlighted in the EIMS Site Sensitivity Verification Report of the 6th August 2025 which indicated that the project could have a high Landscape and Visual impact.

In addition to the above, this document complies with Appendix 6 of the EIA Regulations which lists requirements of Specialist Reports, see schedule below.

Regulation GNR 326 of 4 December 2014, as amended 7 April 2017, Appendix 6	**Section of Report**
1. (1) A specialist report prepared in terms of these Regulations must contain- a) details of- i. the specialist who prepared the report; and ii. the expertise of that specialist to compile a specialist report including a curriculum vitae;	1
b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Separate document.
c) an indication of the scope of, and the purpose for which, the report was prepared;	1
(cA) an indication of the quality and age of base data used for the specialist report;	1
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	3
d) the date and season of the site investigation and the relevance of the season to the outcome of the assessment;	1
e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	1, 5 & Appendix IV
f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	4
g) an identification of any areas to be avoided, including buffers;	4
h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	Maps 3, 4, 5, 6 & 7
i) a description of any assumptions made and any uncertainties or gaps in knowledge;	1
j) a description of the findings and potential implications of such findings on the impact of the proposed activity, (including identified alternatives on the environment) or activities;	5 & 6
k) any mitigation measures for inclusion in the EMPr;	5
l) any conditions for inclusion in the environmental authorisation;	5
m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	5
n) a reasoned opinion- i. whether the proposed activity, activities or portions thereof should be authorised; (iA) regarding the acceptability of the proposed activity or activities; and ii. if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;	6

o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	None
p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	-
q) any other information requested by the competent authority.	-
2) Where a government notice *gazetted* by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	1

Landscape and Visual Impact Assessment input has been undertaken in accordance with the following guideline documents:

a. The Government of the Western Cape Guideline for Involving Visual and Aesthetic Specialists in EIA Processes (Western Cape Guideline), which is the only local relevant guideline, setting various levels of assessment subject to the nature of the proposed development and surrounding landscape; and

b. The Landscape Institute and Institute of Environmental Management and Assessment (UK) Guidelines for Landscape and Visual Impact Assessment which provides detail of international best practice (UK Guidelines).

Refer to **Appendix II** for the Western Cape Guideline.

In accordance with the Western Cape Guidelines, the proposed project may be categorised as a Category 5 development as it is "***large scale infrastructure***" Due to the nature of the surrounding landscape which may be categorised as an "**Area of low scenic, cultural, historical significance / disturbed**" also in accordance with the Western Cape Guidelines, the proposed development may be categorised as "**high visual impact expected**".

If a high visual impact is expected the guidelines also stipulate that a project will result in:

- Potential intrusion on protected landscapes or scenic resources;
- Noticeable change in visual character of the area; and
- Establishes a new precedent for development in the area.

This is actually not the case as:

- No protected landscapes will be affected:
- The existing landscape includes extensive mine areas including associated infrastructure and deposition areas; and
- A degree of degradation of the natural character of the area has occurred due to the development of existing mining operations.

If a moderate visual impact might be expected, the Western Cape Guidelines indicate that a development will:

- Potentially some effect on protected landscapes or scenic resources;
- Some change in the visual character of the area;
- Introduces new development or adds to existing development in the area.

The proposed development will not significantly affect scenic resources, however, it will result in some change in visual character of the affected area and will add to existing infrastructure development in the area.

If a moderate visual impact might be expected, a Level 3 Assessment is required by the Western Cape Guidelines.

A Level 3 Assessment requires the following input:

- Identification of issues raised in scoping phase, and site visit;
- Description of the receiving environment and the proposed project;
- Establishment of view catchment area, view corridors, viewpoints and receptors;
- Indication of potential visual impacts using established criteria;
- Inclusion of potential lighting impacts at night;
- Description of alternatives, mitigation measures and monitoring programmes.
- Review by independent, experienced visual specialist (if required).

A Level 4 Assessment requires the same input as Level 3 plus "complete 3D modeling and simulations, with and without mitigation".

Based on the above information and because Level 4 Assessments works as a natural progression from Level 3, the assessment has been undertaken as a Level 3 Assessment on the understanding that if:

- Significant impacts are found; or
- If there is significant concern raised by receptors or the relevant authority.

The Assessment may be elevated to Level 4 with the inclusion of simulations from agreed / required viewpoints.

1.5 LIMITATIONS AND ASSUMPTIONS

The following limitations and assumptions should be noted:

In the assessment tables the subjective judgement as to whether an impact is negative or positive is based on the assumption that the majority of people are likely to prefer to view a natural or a rural landscape than an industrial landscape.

A site visit was undertaken on the 3rd September 2025 to verify the current landscape characteristics, potential receptors and potential impacts.

The site visit was planned to ensure that weather conditions were clear ensuring reasonable visibility.

The timing of photography was planned to ensure that the sun was as far as possible behind the photographer. This was to ensure that as much detail as possible was recorded in the photographs.

Visibility of the proposed facility has been assessed using the Global Mapper Viewshed tool.

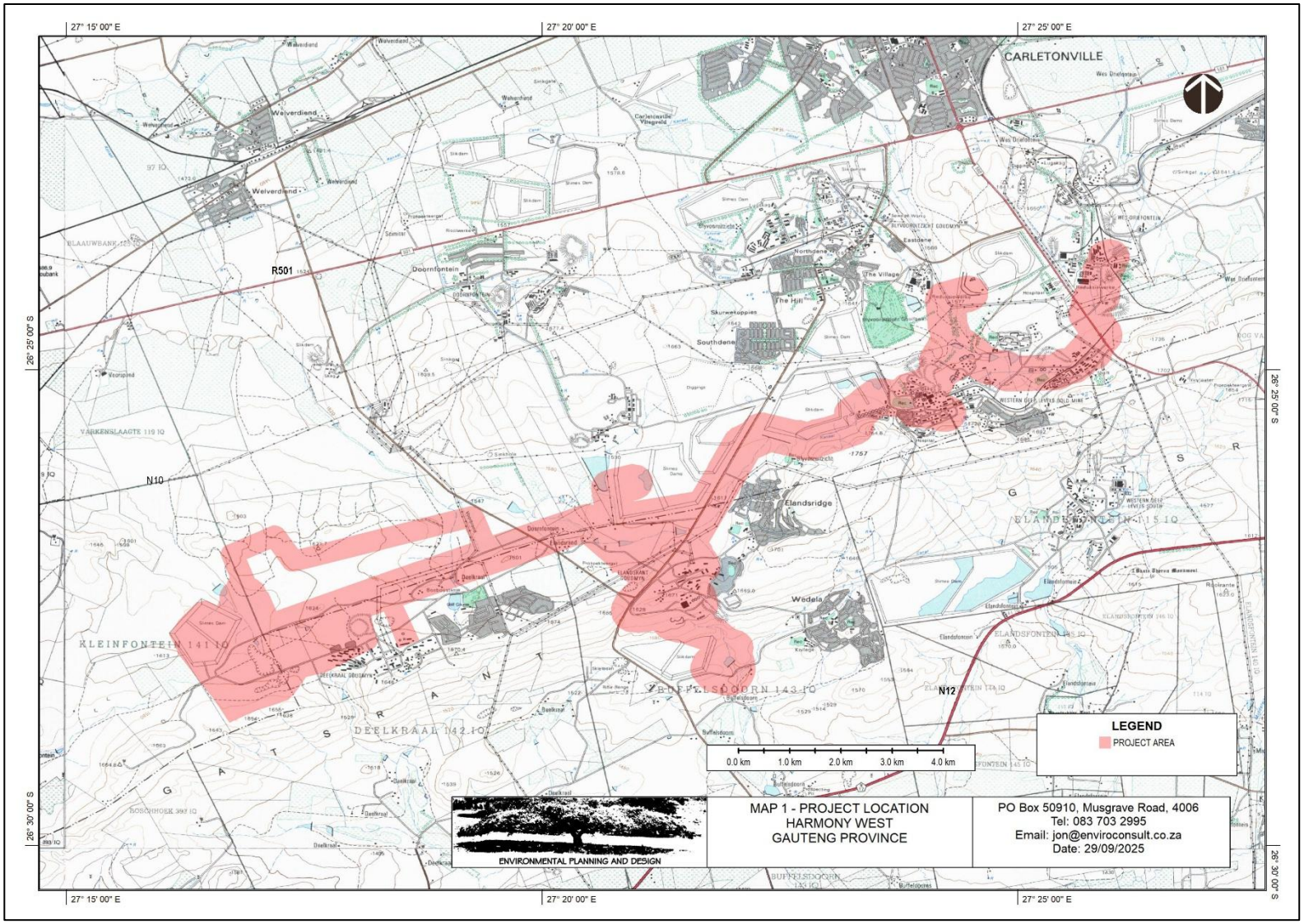
The visibility assessment is based on terrain data that has been derived from satellite imagery. This data was originally prepared by NASA and is freely available on the CIAT-

CCAFS website (http://www.cgiar-csi.org). This data has been ground truthed using a GPS as well as online mapping.

Calculation of visibility is based purely on the Digital Elevation Model and does not take into account the screening potential of vegetation or other development.

The following GIS data sets were used in undertaking and presenting the assessments:

DATA SET	SOURCE	YEAR
South Africa Protected Areas Database (SAPAD)	Department of Environmental Affairs	2021
SRTM Worldwide Elevation Data	CIAT-CCAFS	2018
World Imagery	ESRI	2009 (updated 2021)
SA NLC (National Land Cover)	Department of Environmental Affairs	2022
1:50,000 raster mapping	Chief Directorate National Geo-Spatial Information of South Africa	Unknown
South African rivers in drainage region ALL	Department of Water Affairs	2012
Update of vegm2009	South African National Biodiversity Institute	2015
South Africa /Lesotho Roads	Open Street Map	2014


27° 15' 00" E
27° 20' 00" E
27° 25' 00" E
26° 25' 00" S
26° 30' 00" S
CARLETONVILLE
Welverdiend
Doornfontein
Southdene
Northdene
The Village
The Hill
Eastdene
Elandsridge
Wedela
R501
N10
N12
LEGEND
PROJECT AREA
0.0 km
1.0 km
2.0 km
3.0 km
4.0 km
ENVIRONMENTAL PLANNING AND DESIGN
MAP 1 - PROJECT LOCATION
HARMONY WEST
GAUTENG PROVINCE
PO Box 50910, Musgrave Road, 4006
Tel: 083 703 2995
Email: jon@enviroconsult.co.za
Date: 29/09/2025

2. PROPOSED DEVELOPMENT AND ITS GENERAL VISIBILITY

2.1 PROJECT MOTIVATION

The Applicant requires additional deposition capacity for West Wits region's operations. The planned Life of Mine (LOM) for the West Wits region exceed the available deposition capacity of the existing TSFs. Therefore additional depsotion capacity is required.

2.2 PROJECT DETAIL

The applicant plans on constructing the Deelkraal II Tailings Storage Facility (TSF) to cater for the additional future capacity. This TSF will receive residue from Kusasalethu, and Savuka plants and will also assist in returning process water for reclaiming the existing Deelkraal 1 TSF and Kusasalethu TSF for processing at Kusasalethu plant. Additional planned infrastructure includes slurry, potable, sewage and return water pipelines, access roads, pump stations, a return water dam and a power line. Proposed upgrades to the existing Kusasalethu plant are also proposed as part of the project.

The Savuka Plant treats tailings from the Savuka Dormant TSFs (Old North TSFs) at a rate of 330 000 tpm and deposits the subsequent tailings on Savuka 5 & 7 TSFs. Harmony plans on remining Deelkraal 1 Dormant TSF and Kusasalethu TSF amongst other potential future sources. These TSFs will be processed through the Kusasalethu Plant at 500 000 tpm.

The Kusasalethu Plant will accommodate future reclamation operations and will therefore need site/s to deposit the tailings. Harmony owns ground, located adjacent to the Deelkraal 1 Dormant TSF, that can be used i.e. for the proposed Deelkraal II TSF. The Deelkraal 1 Dromant TSF and adjacent virgin ground footprint combined geometry will accommodate the future reclamation operations deposition rate and capacity. The proposed TSF will cover an area of approximately 430 ha .

The West Wits Reclamation (WWR) Concept Study explores ways to unlock the potential of recycling historic gold tailings using the existing Kusasalethu and Savuka process plants and infrastructure. The Concept Study (SGS Bateman, 2024) evaluated different options for the treatment of the Deelkraal 1 and Kusasalethu Tailings Storage Facilities (TSF) at the existing processing plants. The reworked tailings will be deposited on a new TSF, referred to as Deelkraal II, assumed to be constructed on a site adjacent to the existing Deelkraal TSF. While reviewing the preliminary metallurgy testwork results it became evident that the Deelkraal TSF contained higher grades of accessible gold and it was agreed that that TSF would be reclaimed first, with the Kusasalethu TSF being reclaimed thereafter (SGS Bateman, 2024).

In addition to the Deelkraal II TSF, additional infrastructure is also proposed, as follows:

- A new Return Water Dam in the vicinity of the Deelkraal II TSF;
- Upgrades to the existing Kusasalethu plant including new/upgrade of gold and new uranium sections;
- Slurry pipelines:

- Reclaimed Slurry from Deelkraal 1 to Kusasalethu (~10,6km[1]);
- Kusasalethu Barren Tailings to Deelkraal II and booster pump station (~10,2km);
- Reclaimed Slurry from Kusasalethu TSF to Kusasalethu Plant (~2km);
- Slurry pipeline from Kusasalethu Plant to Savuka TSF (~4,97km); and
- Slurry pipeline from Savuka plant to DF5 TSF (~2,9km).

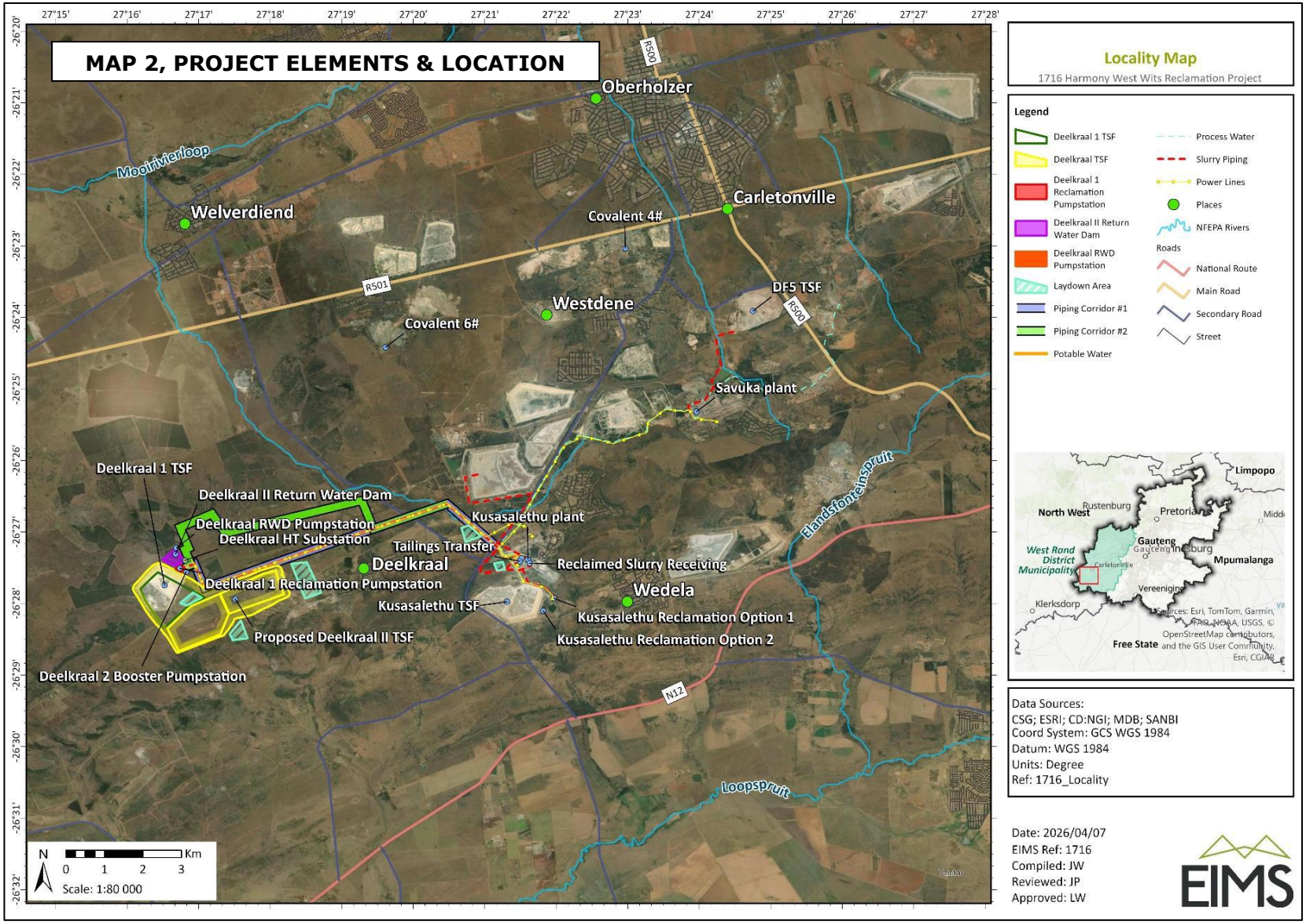
- Process Water Pipelines:
  - Process Water Feed from Kusasalethu Plant to Deelkraal Reclamation(~9.54km) –
  - Return Water Feed to Kusasalethu Process Water Tank (~9,58km); -
  - Driefontein DP2 Pump Station to North Boundary Dam (~4,78km); -
  - DP2 feed to Tau Tona Reverse Osmosis Plant (~0,1km); -
  - Nursery Pumpstation #3 to Kusasalethu Process Water Tank (~9km); and
  - 2 Process Water pipelines from Kusasalethu Plant to Savuka White Tanks (~8km).

- Powerlines (all powerlines will be 22kV or lower):
  - Powerline from Kusasalethu Plant to the existing Deelkraal TSF (~9.2km);
  - Powerline from Kusasalethu Plant to the Kusasalethu TSF (~1.8km);
  - Powerline from Savuka shaft to Kusasalethu Plant (~8.1km);

- Potable Water pipeline from Rand Water supply point to the Deelkraal TSF (~8.52km).
- Deelkraal 1 TSF Reclamation Pump Station.
- Kusasalethu TSF Reclamation Pump Station.
- New Access Roads (2x3,5m double road) adjacent to pipeline routes/OH lines and around Deelkraal II TSF (where no access road is already in place).
- Topsoil Stockpiles and overburden stockpiles.
- Ancillary construction infrastructure including workshops and laydown areas.

All pipelines listed above will be flanged steel pipelines installed above-ground on pre-cast concrete plinths and two 3.5m wide access roads (double road), adjacent to the pipelines, will be cleared/graded to provide access for construction, maintenance and inspections (for areas where no access road is already in place). The diameter of the pipelines will be confirmed in the EIA phase once further design information becomes available.

[1] Lengths of pipelines and powerlines provided are approximate and could change by 1 – 2 km depending on the routing alternative selected


MAP 2, PROJECT ELEMENTS & LOCATION
Oberholzer
Carletonville
Welverdiend
Covalent 4#
Westdene
Covalent 6#
DF5 TSF
Savuka plant
Deelkraal 1 TSF
Deelkraal II Return Water Dam
Deelkraal RWD Pumpstation
Deelkraal HT Substation
Tailings Transfer
Kusasalethu plant
Deelkraal
Reclaimed Slurry Receiving
Deelkraal 1 Reclamation Pumpstation
Wedela
Kusasalethu TSF
Kusasalethu Reclamation Option 1
Proposed Deelkraal II TSF
Kusasalethu Reclamation Option 2
Deelkraal 2 Booster Pumpstation
Mooirivierloop
Blandsfonteinspruit
Loopspruit
R500
R501
N12
N
0 1 2 3 Km
Scale: 1:80 000
Locality Map
1716 Harmony West Wits Reclamation Project
Legend
Deelkraal 1 TSF
Deelkraal TSF
Deelkraal 1 Reclamation Pumpstation
Deelkraal II Return Water Dam
Deelkraal RWD Pumpstation
Laydown Area
Piping Corridor #1
Piping Corridor #2
Potable Water
Process Water
Slurry Piping
Power Lines
Places
NFEPA Rivers
Roads
National Route
Main Road
Secondary Road
Street
Limpopo
North West
Rustenburg
Pretoria
Gauteng
Mpumalanga
West Rand District Municipality
Vereeniging
Klerksdorp
Free State
Data Sources:
CSG; ESRI; CD:NGI; MDB; SANBI
Coord System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Ref: 1716_Locality
Date: 2026/04/07
EIMS Ref: 1716
Compiled: JW
Reviewed: JP
Approved: LW
EIMS

The other options to be considered for the high-level trade-off include:

- The old Savuka footprints; and
- The DF5 footprint (DRD).

The study brief requires the following elements to be considered:

- Deposition footprints inclusive of all related infrastructure (trenches, dams, return water):
  - Deelkraal II
  - Trade off:
    - Old Savuka footprints
    - DF5 footprint (DRD)
- Reclamation pump stations
  - Deelkraal 1 TSF
  - Kusasalethu TSF
- Overland pipelines Slurry from reclamation pump stations to Kusasalethu plant
  - Slurry to/from Savuka plant to DRD
  - Process water to Kusasalethu TSF/Deelkraal 1 TSF
  - Potable water to Kusasalethu TSF/Deelkraal 1 TSF
  - Covalent 6# to Kusasalethu plant
  - DRD 10# water
- Processing plants and product route
  - Kusasalethu plant – gold section upgrade
  - Kusasalethu plant – uranium section (new)
  - Uranium loaded resin product to South Uranium Plant, Vaal Reefs, Northwest
- Identify required servitudes, wayleaves, property ownership, change of land use
- Other ancillary infrastructure (construction camps, access roads, powerlines)
- Site regulation/provision:
  - Deelkraal 2 TSF on Kusasalethu mining right area and Kusasalethu EMP
  - Deelkraal 1 TSF is part of Kusasalethu financial provision
  - Deelkraal 2 TSF provision for rehabilitation funding – to cost for first year of construction as part of closure cost assessment study.

2.3 GENERAL VISIBILITY

It is important to identify the extent of general visibility at an early stage in the assessment as this will define the extent of the study area.

The main elements that will have visual implications include:

- The proposed new Deelkraal 2 TSF;
- The proposed pipelines; and
- The proposed overhead powerlines.

The proposed upgrade works at the Aggeneis Substation are likely to have relatively minor visual implications as they are located within the existing footprint and the upgrade will be similar in nature to existing infrastructure.

2.4 DEELKRAAL 2 TSF

The maximum height of the Deelkraal II TSF will be 65m. Given that the maximum level of the proposed site is approximately 1614m a.m.s.l (above mean sea level), it is possible that this facility could extend to 1679m a.m.s.l.

It has to be assumed that this proposed new TSF will be similar in appearance to other existing TSFs within the mine. Plate 1 is an image of two existing TSFs within the mine. The TSF centre image has not been rehabilitated. The TSF on the right of the image has significant plant growth on its face because of which it blends visually with its surroundings.

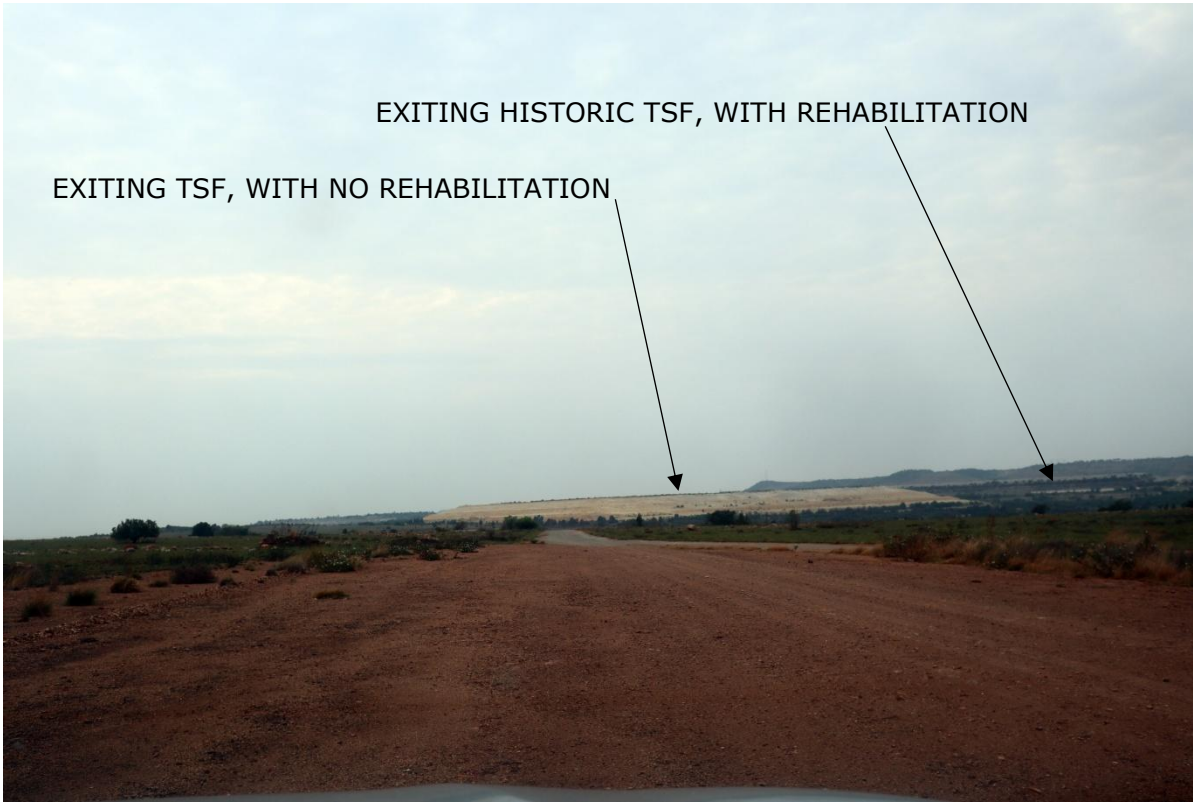


Plate 1, Existing TSFs within the mine

It is likely that the proposed new TSF will be highly obvious in the landscape until rehabilitation / time takes effect. It is possible that rehabilitation may be undertaken in stages but it will not have overall effectiveness until the facility reaches its ultimate height.

When the face of the TSF is rehabilitated it is likely that it will blend visually with its surroundings. However, its shape may contrast with the surrounding natural landform permanently.

From the site visit, it should be noted that the proposed Deelkraal II TSF is located between two existing ridgelines which should partly screen views from surrounding areas.

2.5 POWER LINES

The proposed power lines are likely to be 33kV to 88kV powerlines.

Plate 2 is a view of existing powerlines within the mine. It is assumed that the proposed powerlines will be similar in nature.



Plate 2, Existing Powerlines within the mine

From the site visit and the image above, existing powerlines are lower than 20m high.

Plate 3 indicates a view along a small overhead power line which is likely to be slightly higher (28M) than the power line associated with this project (estimated 20m). The view was taken during a period of good visibility along the line of towers which have a spacing of +/- 250m. In total 9 towers are visible along the line before it connects to a line running at right angles. The last tower in the line which is a solid pole structure is just visible at +/-2.5km.

From this review it is obvious that whilst the theoretical distance that the power line may be visible from a greater distance, in reality it is only visually obvious to the human eye for approximately 2-3km.

The following visual limits have been drawn from these observations:

a) Due to the matt grey colour of the galvanised steel from which it is constructed, visibility of overhead power line structures reduces significantly with distance.

Timber supports associated with the proposed powerlines are likely to have the same effect.

b) The visual mass of the overhead power line is unlikely to be visually obvious from distances greater than 2.5km. As the proposed powerline is likely to be lower than the image, this distance is considered to be the maximum over which the proposed powerline may be visible.



Plate 3 - A view along the line of an overhead power line with monopole towers

It is noted that there is an alternative powerline corridor to the east of the Deelkraal HT Substation under consideration. This alternative is located on high ground to the north of The Alternative 1 alignment. It is approximately 7.5km long compared with the approximate 6.5km length of Alternative 1.

2.6 PIPELINES

Plates 4 and 5 are views of existing pipelines within the mine. It is assumed that the proposed pipelines will be similar in nature.



Plate 4 - A view of a typical existing pipeline within the mine

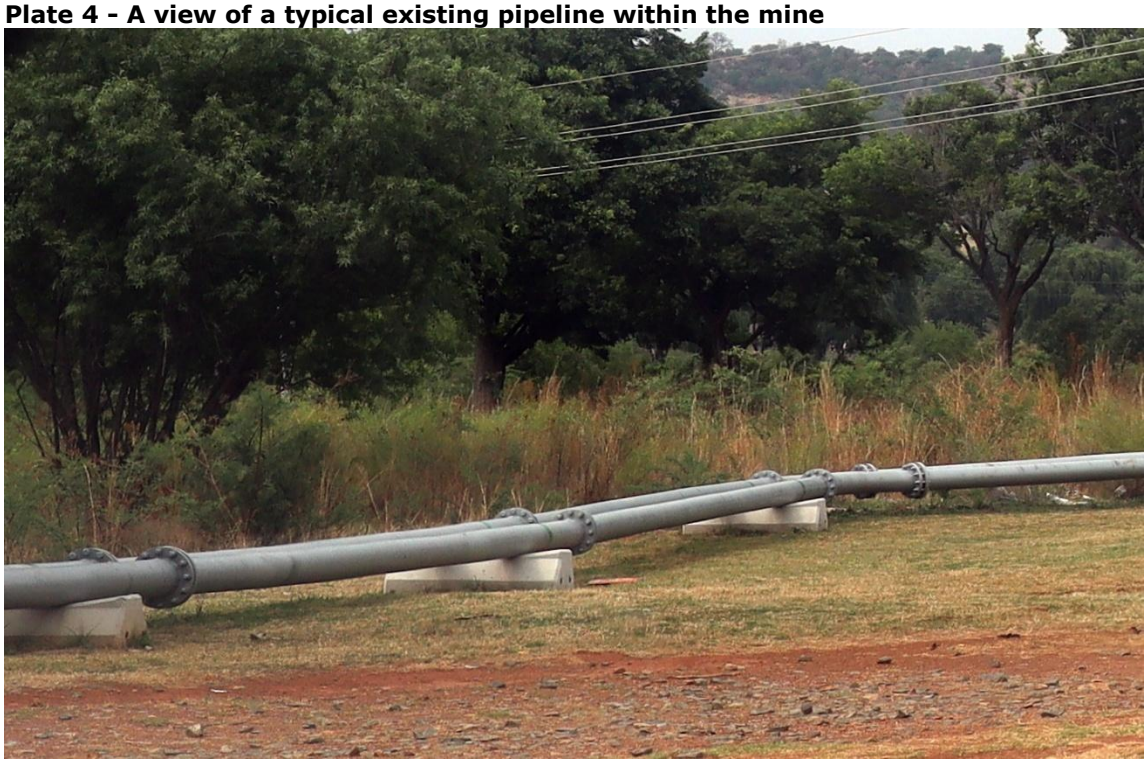


Plate 5 - A close up view of a typical existing pipeline within the mine

The applicant has confirmed that all proposed pipelines are likely to be similar in nature to these existing pipelines in that they will be above ground with a maximum diameter of 500mm.

It is obvious from the site visit and the above images that these pipelines generally run along the sides of roads and they are only visually obvious from the immediate area around the roads that they run beside.

2.7 VISUAL LIMITS

From the review of the main visual elements, it is obvious that the elements that will have the largest visual implications include:

- The proposed Deelkraal 2 TSF which may have an ultimate height of approximately 65m.

A mathematical calculation has been used to indicate the Approximate Visual Horizon of the proposed Deelkraal 2 TSF. The formula used is a universally accepted formula that is used widely for navigation and is indicated in **Appendix III**. This indicates that the most obvious project elements are likely to have the be Approximate Limit of Visibility (ALV) indicated below.

ELEMENT	APPROXIMATE EXTENT OF VISIBILITY (ALV)
Deelkraal 2 TSF, up to 65m high	28.8km
Overhead power line, up to 20m high	2.5km

It should be noted that in reality the visibility of the proposed TSF is likely to be reduced by:

- Weather conditions that limit visibility. This could include hazy conditions during fine weather as well as mist and rain;
- Scale and colour of individual elements making it difficult to differentiate structures from the background;
- The fact that as the viewer gets further away, the apparent height of visible elements reduces. At the limit of visibility it will only be possible that the very tip of an object may be visible. This reducing scale means that an object will become increasingly more difficult to see as the distance from it increases; and
- Likely rehabilitation of the slopes over time making it difficult to differentiate from surrounding areas.

The visual limit indicated above is likely to be the worst case limits, because of this it has been used to define the extent of the study area.

2.6 THE DEVELOPMENT PROCESS

2.6.1 Overhead Powerlines

Initial construction is unlikely to have a significant visual impact. Initially work will take place around each tower. Activities will be obvious over limited areas only. The most obvious elements are likely to include;

- Storage of poles / pylons for tower construction.
- Trucks and mobile cranes

As work progresses, poles / pylons will become obvious in the landscape. Work is likely to take place on a limited number of towers at any one time which means that during construction, poles / pylons will gradually appear in the landscape on a progressive basis.

By the end of the construction process, when cables have been strung between poles / pylons, the full visual impact of the project will be experienced. The operational phase is highly unlikely to result in any significant additional impact. It is possible however, that crews will be visible from time to time undertaking maintenance on individual towers.

2.6.2 Tailings Storage Facility (TSF)

TSFs vary in design but typically consist of embankments made of earth and rock materials. Over time the TSF wall is raised to accommodate increasing volume of tailings.

A TSF is therefore constructed in stages. The initial stage will include the initial TSF wall, pump facilities, outfall, lining, and facilities to treat water that drains from the facility. Subsequent wall construction periodically increases the TSF height until it reaches its designed capacity.

The proposed TSF will therefore grow over time.

3 RECEIVING ENVIRONMENT, VIEW CATCHMENT AND LIKELY VISUAL IMPACTS

3.1 THE STUDY AREA

It is possible that landscape change due to the proposed development could impact the character of the surrounding landscape. Landscape character can be derived from specific features relating to the urban or rural setting and may include key natural, historic or culturally significant elements. Importance might also relate to landscapes that are uncommon or under threat from development.

This section will:

- describe the types of landscapes that may be impacted;
- indicate likely degree of sensitivity; and
- describe how the landscape areas are likely to be impacted.

The study area is defined as the area over which the proposed project may be visible which is dependent on the height of the various project elements. As indicated previously, it has been assumed that the Limit of Visual Effect (**LVE**) will be 28.8km.

3.2 LANDSCAPE CHARACTER

Landscape character is defined as "a distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another"[2].

The proposed site is located within an extensive mine development that is located within a series of valley ridgelines north and south of which are largely areas of natural vegetation interspersed with cultivated areas.

Landscape Character is a composite of a number of influencing factors including;

- Landform and drainage
- Nature and density of development
- Vegetation patterns

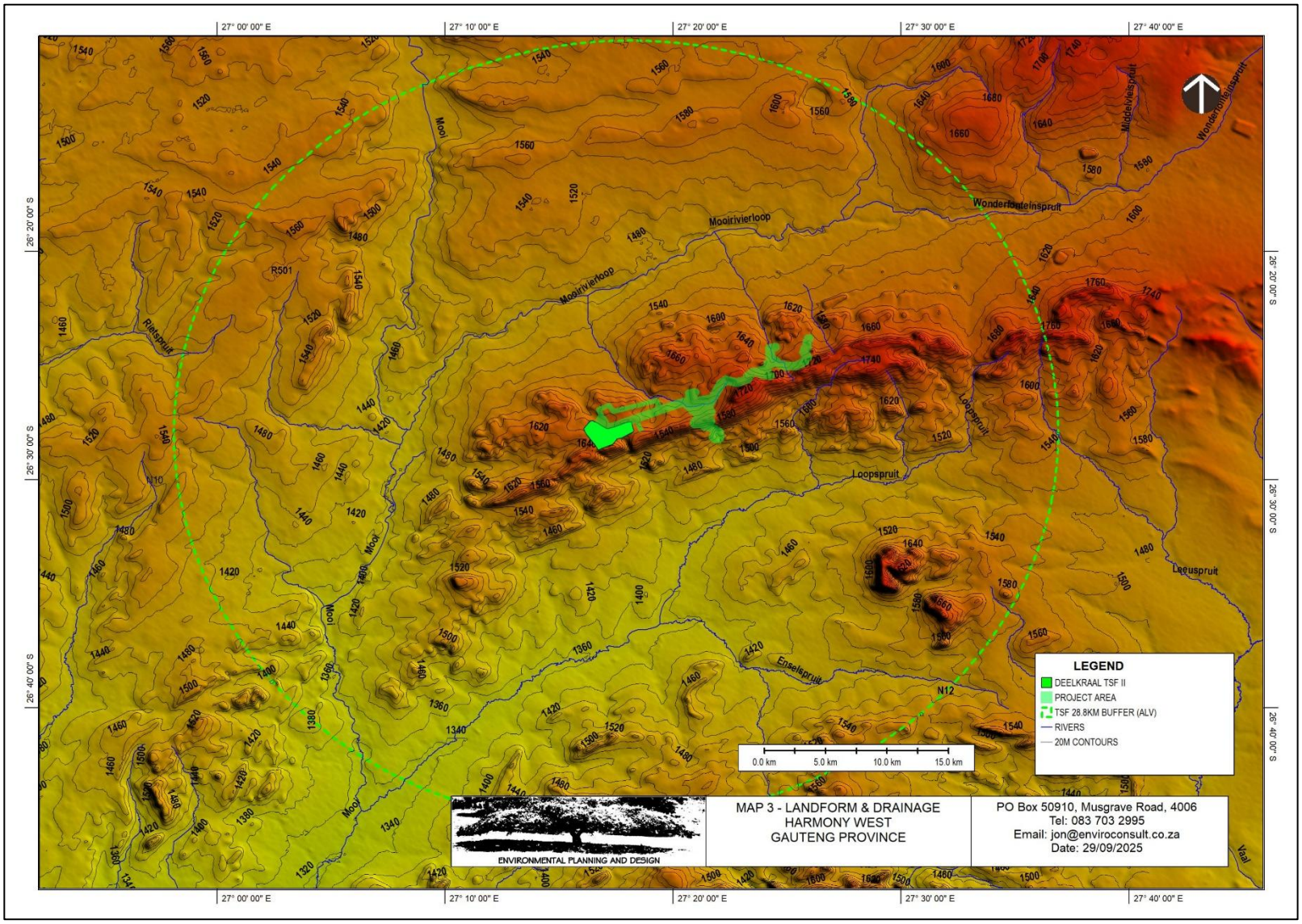
3.2.1 Landform and Drainage

The site is located within a series roughly east – west running valleys and ridgelines that rise approximately 200m above surrounding areas.

The main drainage features are the Mooirivierloop that runs parallel and north of the ridgelines and the Loopspruit that runs south of the ridgelines. Both rivers are perennial in nature. The Loopspruit joins the Mooa approximately 34km south of the proposed site. The Mooi subsequently flows into the head of the Vaal River approximately 23km further south-west.

There are numerous non-perennial watercourses that flow north and south from the site area into the Mooirivierloop and the Loopspruit respectively. **Refer to Map 2** for analysis of the landform and drainage.

[2] UK Guidelines


27° 00' 00" E
27° 10' 00" E
27° 20' 00" E
27° 30' 00" E
27° 40' 00" E
26° 20' 00" S
26° 30' 00" S
26° 40' 00" S
Mooi
Mooirivierloop
Wonderfonteinspruit
Middelvleispruit
Rietspruit
Loopspruit
Leeuspruit
Enselspruit
Vaal
R501
N10
N12
LEGEND
DEELKRAAL TSF II
PROJECT AREA
TSF 28.8KM BUFFER (ALV)
RIVERS
20M CONTOURS
0.0 km
5.0 km
10.0 km
15.0 km
ENVIRONMENTAL PLANNING AND DESIGN
MAP 3 - LANDFORM & DRAINAGE
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3.2.2 Landcover

Landcover within the study area is indicated on Map 3. Landcover can be divided into the following types;

Within the Ridges and Valley system in which the project is proposed;

- **Natural Vegetation**. This is the main landcover type surrounding the proposed development is natural area. This area is mainly comprised of natural grassland that has been invaded by alien species.
- **Planted Forest**. This is largely Blue Gum trees that may have originally been planted, however, these trees appear to be spreading naturally into grassland areas.
- **Mine development** which includes a number of shaft sites, mine dumps and tailings facilities, and associated infrastructure that is spread throughout the area. Associated infrastructure includes pump stations, access roads, pipelines and electrical powerlines.
- **Residential Villages** that have been developed to house mine workers. There are two residential villages in the vicinity of the proposed project including;
    - Kusasalthu which is removed from the proposed project and is unlikely to be affected directly by it; and
    - Deelkraal which is approximately 1km from the proposed Deelkraal TSF site.

Within the areas to the north and south side of the Ridges and Valley system in which the project is proposed;

- **Natural Vegetation**. This is the main landcover type surrounding the proposed development is natural area. This area is mainly comprised of natural grassland that has been invaded by alien species;
- **Cultivated land** many of which are irrigated; and
- **Settlement areas,** to the north these are largely comprised of new development areas on the western side of Carletonville, to the south they include the small hamlet of Klipdrf to the east of Potchesfstroom and the settlements of Kokosi and Fochville.
- **Main roads that include;**
    - the N12 to the north; and
    - the R54 to the south.

Refer to Map 3 for Landcover.

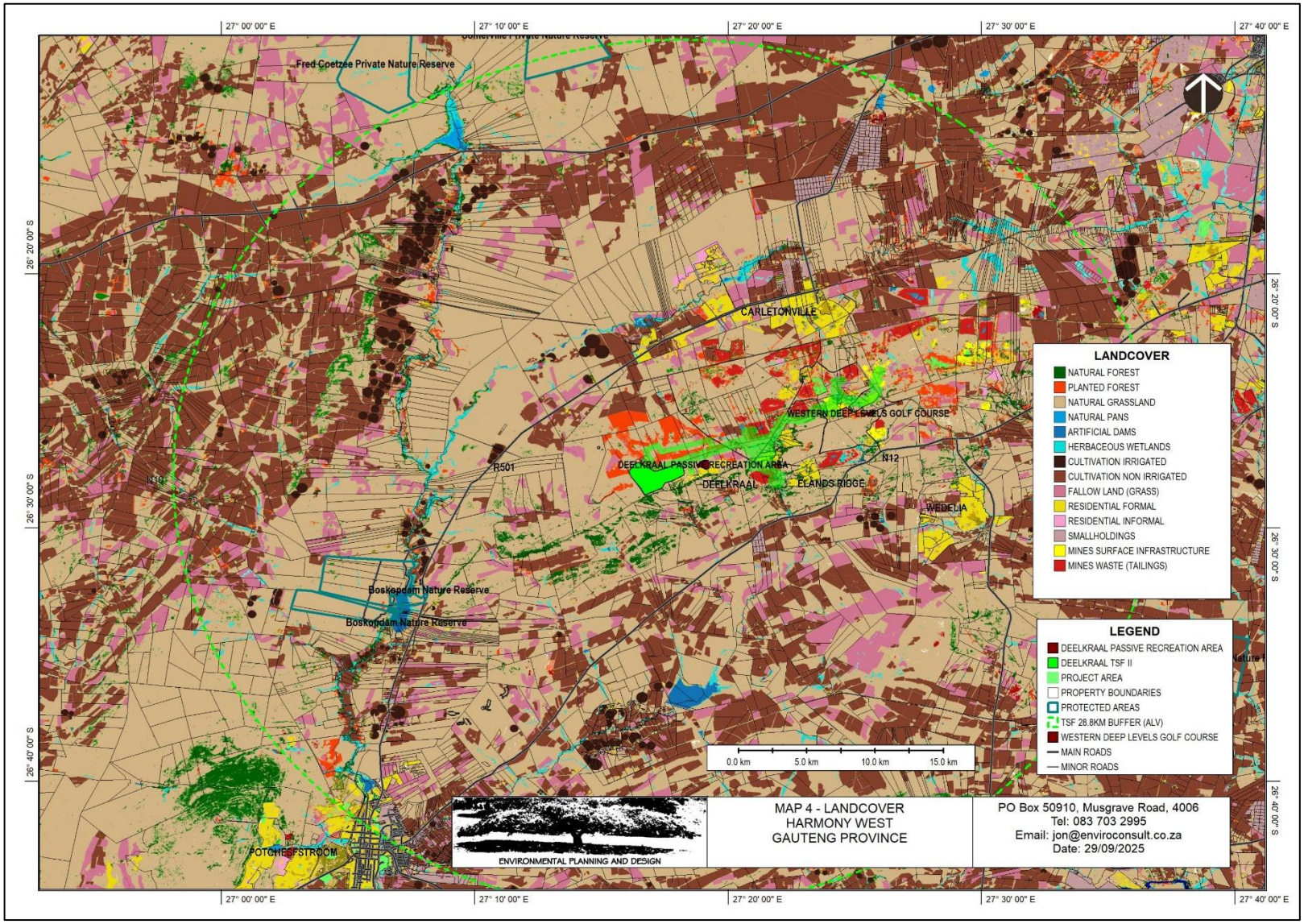
3.2.3 Vegetation Patterns

Mucina, and Rutherford (Vegetation of South Africa, Lesotho and Swaziland, 2006) indicate that the vegetation types within the study area include;

- Gauteng shale mountain bushveld which covers the area of ridgelines and valleys within which the project is proposed;
- Rand highveld grassland which covers the area to the south of the ridgelines and valleys within which the project is proposed;
- Carletonville dolomite grassland that covers the area to the south of the ridgelines and valleys within which the project is proposed.

Gauteng shale mountain bushveld is typically comprised of semi-open bushveld on rocky slope with a variety of woody species, including small trees and shrubs. This vegetation type is therefore likely to provide a large degree of screening within the ridges and valleys.

Whilst there are significant botanical differences between the grassland types to the north and south of the ridgelines and valley, in terms of visual implications, the main issue is that they are both very low and provide no screening ability.


27° 00' 00" E
27° 10' 00" E
27° 20' 00" E
27° 30' 00" E
27° 40' 00" E
26° 20' 00" S
26° 30' 00" S
26° 40' 00" S
Fred Coetzee Private Nature Reserve
CARLETONVILLE
WESTERN DEEP LEVELS GOLF COURSE
DEELKRAAL PASSIVE RECREATION AREA
DEELKRAAL
ELANDS RIDGE
WEDELIA
R501
N12
N14
Boskopdam Nature Reserve
Boskopdam Nature Reserve
POTCHEFSTROOM
LANDCOVER
NATURAL FOREST
PLANTED FOREST
NATURAL GRASSLAND
NATURAL PANS
ARTIFICIAL DAMS
HERBACEOUS WETLANDS
CULTIVATION IRRIGATED
CULTIVATION NON IRRIGATED
FALLOW LAND (GRASS)
RESIDENTIAL FORMAL
RESIDENTIAL INFORMAL
SMALLHOLDINGS
MINES SURFACE INFRASTRUCTURE
MINES WASTE (TAILINGS)
LEGEND
DEELKRAAL PASSIVE RECREATION AREA
DEELKRAAL TSF II
PROJECT AREA
PROPERTY BOUNDARIES
PROTECTED AREAS
TSF 28.8KM BUFFER (ALV)
WESTERN DEEP LEVELS GOLF COURSE
MAIN ROADS
MINOR ROADS
0.0 km
5.0 km
10.0 km
15.0 km
ENVIRONMENTAL PLANNING AND DESIGN
MAP 4 - LANDCOVER
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3.3 LANDSCAPE CHARACTER, QUALITY AND IMPORTANCE

3.3.1 General.

There is one protected landscapes within the study area;

The Boskop Dam Nature Reserve is situated on the Mooi River about 14 km's northeast of Potchefstroom and approximately 16km west of the proposed project. In addition to its conservation value, Boskop Dam is reported to be one of the most visited reserves in the North West. It therefore appears to be an important regional recreation area.

It is possible that the upper areas of the TSF could be visible from the reserve, however, given the distance and the ridgelines surrounding the proposed site, it is unlikely that at the TSF or surrounding infrastructure will be visually discernable from its surroundings.



Plate 6 - A view looking towards the ridgelines within which the project is located from the R501 close to Boskopdam Nature Reserve

3.3.2 Landscape Character Areas

Landscape Character Areas (LCAs) are defined as "single unique areas which are the discrete geographical areas of a particular landscape type"[3].

Visual Absorption Capacity (VAC) is *defined* as the landscape's ability to absorb physical changes without transformation in its visual character and quality. Where elements that contrast with existing landscape character are proposed, VAC is dependent on elements such as landform, vegetation and other development to provide screening of a new element. The scale and texture of a landscape is also critical in providing VAC, for example; a new large scale industrial development located within a rural small scale field pattern is likely to be all the more obvious due to its scale.

The affected landscape is divided by the ridgeline and valley system within which the proposed project is located into three distinct areas, including:

- **The area of east / west aligned ridgelines and valleys** within which the proposed project is located that includes the following landscape characteristic;
    - Valley slopes and ridgelines that are steep relative to areas directly to the north and south;
    - A mix of alien trees including plantations within indigenous grassland areas;
    - Mining areas including infrastructure, waste and extraction sites; and
    - Formal housing areas that are largely associated with mining operations.
- **The area to the north of the ridgelines** that includes the following landscape characteristics;
    - Relatively flat topography;
    - Areas of housing development that are largely high density housing and medium rise blocks that appear relatively new and under development and
    - Areas of commercial cultivation and grazing within a matrix of natural grassland and stands of alien trees.
- **The area to the south of the east / west aligned ridgelines and valleys** that includes the following landscape characteristics;
    - Relatively flat topography;
    - Residential settlement largely in the form of individual homesteads; and
    - Areas of commercial cultivation and grazing within a matrix of natural grassland and stands of alien trees.

[3] Landscape Institute & Institute of Environmental Management and Assessment

LANDSCAPE CHARACTER AREAS



Plate 7, Flat agricultural land north of the ridgelines and valleys



Plate 8, High density housing north of the ridgelines and valleys.



Plate 9, Mining infrastructure, natural grassland and alien trees / plantations within the ridgelines and valleys.



Plate 10, the mining village settlement of Deelkraal within the ridgelines and valleys.



Plate 11, Flat agricultural land south of the ridgelines and valleys.



Plate 12, Individual isolated homesteads south of the ridgelines and valleys.

3.4 VISUAL RECEPTORS

3.4.1 Definition

Visual Receptors are defined as "individuals and / or defined groups of people who have the potential to be affected by the proposal".

It is also possible that an area might be sensitive due to an existing use. The nature of an outlook is generally more critical to areas that are associated with recreation, tourism and in areas where outlook is critical to land values.

3.4.2 Possible visual receptors and sensitivities

This section is intended to highlight possible visual receptors within the landscape which due to use could be sensitive to landscape change. They include;

Area Receptors

- **Deelkraal, Elandsridge and Wedelia** are small mining settlement that is located within the area of ridgelines and valleys and within 1km of the proposed Deelkraal II TSF. Elandsridge is located in the vicinity of proposed pipeline and overhead power line routes and is approximately 6.2km from the proposed Deelkraal TSF;
- **The Boskopdam Nature Reserve** that is located approximately 16km to the west of the proposed project; and
- **A Passive Recreation Area** immediately north of Deelkraal.

Linear Receptors

- **The R501** which is the main road running through the area to the north of the proposed project. This road connects Carletonville to the north-east with Potchesfstroom to the south-west; and
- **The N12** which runs through the area to the south of the proposed project. This road connects Potchesftroom to the south-west with Soweto and the greater Johannesburg area to the east.
- **Minor roads** that run through the area of ridgelines and valleys within which the proposed project is located. These roads are largely used by local people and for mine access.

Point Receptors

- **Individual homesteads** particularly those located in the area to the south of the proposed project area.

It should be noted that all point receptors were not visited to verify the nature of their use. It is assumed that this responsibility will fall within the project scoping exercise and / or the social specialist's input.



Plate 13, Passive Recreation Area immediately north of Deelkraal

3.5 LANDSCAPE AND RECEPTOR SENSITIVITY

It is difficult to define hard and fast criteria for assessment of subjective issues. In order to provide both consistency and transparency to the assessment process, the table below indicates the criteria that are proposed to guide the judgement as to the sensitivity of the landscape character areas and the various visual receptors in their interaction with the identified LCAs.

SENSITIVITY	LCA	RECEPTORS
Low	Areas not recognised as having specific landscape value; • **The area of east / west aligned ridgelines and valleys.**	Viewer's attention not focused on landscape. These include: • **Travellers on minor roads including unsurfaced roads.**
Medium	Landscape value is recognised locally, but is not protected; the landscape is relatively intact, with a distinctive character; and the	Viewers' attention may be focused on landscape. These include: • **Mining Settlements including Deelkraal, Elandsridge and Wedelia;**

SENSITIVITY	LCA	RECEPTORS
	landscape is reasonably tolerant of change. These areas include: • **The flat, rural LCAs to the north and south of the east / west aligned ridgelines and valleys**	• **Travellers on main roads including the R501 and the N12; and** • **Individual homesteads.**
High	The qualities for which the landscape is valued are in a good condition, with a clearly apparent distinctive character. This distinctive character is susceptible to relatively small changes. **There are no landscape character areas with a high significance.**	Viewer's attention very likely to be focused on landscape, e.g. people experiencing views from important landscape features of local physical, cultural or historic interest and beauty spots. Large number of viewers and/or location in a highly valued landscape could elevate viewer sensitivity to the highest level. **Visitors to the Boskopdam Nature Reserve and visitors to the Deelkraal Passive Recreation Area.**

4 SITE SENSITIVITY

4.1 KEY LANDSCAPE OBSERVATIONS

The following observations were made during the site visit:

- The general landscape is relatively typical of the region;
- The series of ridgelines and valleys generally hides the existing mining operations from areas to the north and south of the proposed development area;
- There are numerous examples of mining infrastructure similar in nature to that proposed in the vicinity of the proposed development area; and
- Vegetation appears to be largely alien invasive in nature and includes large stands of blue gums.
- The proposed development is likely to be most obvious from immediately adjacent roads.



Plate 14, A pipeline similar in size to proposed pipelines that is aligned beside a mine road.



Plate 15, A view over the site of the proposed Deelkraal TSF.
The existing Deelkraal I TSF can be seen right of picture.

4.2 SENSITIVE AREAS

The assessment of site sensitivity within the potentially affected area seeks to both maintain key landscape features and minimise potential impacts for receptors.

Potential receptors include motorists on local roads and residents of mining villages.

The main element that could result in modification of landscape features is the proposed Deelkraal II TSF. It is noted that this will largely be within a valley system that is likely to largely screen the facility from surrounding areas.

It is also likely that more minor elements including powerlines and pipelines that will largely run beside existing minor roads are likely to be visible to motorists. Whilst most residential areas are relatively enclosed and inward looking, it is likely that these elements could also be visible to residents entering and leaving residential areas. Views of these elements are likely to be a minor concern for residents given the extent of existing views of such features. What may be of greater concern, however, could be the location of large storage areas, temporary spoil heaps and contractors compounds located in the vicinity of residential areas.

Given the topography within which the project is set and the extent of mining infrastructure within the area, it is not surprising that the proposed development area is not likely to be overly visually sensitive to the proposed development a large proportion of which includes relatively small scale infrastructure.

The following Site Sensitive areas have been identified;

4.2.1 No-Go Areas

No, No-Go Areas have been identified.

4.2.2 Highly Sensitivity Areas:

No, Highly Sensitive Areas have been identified.

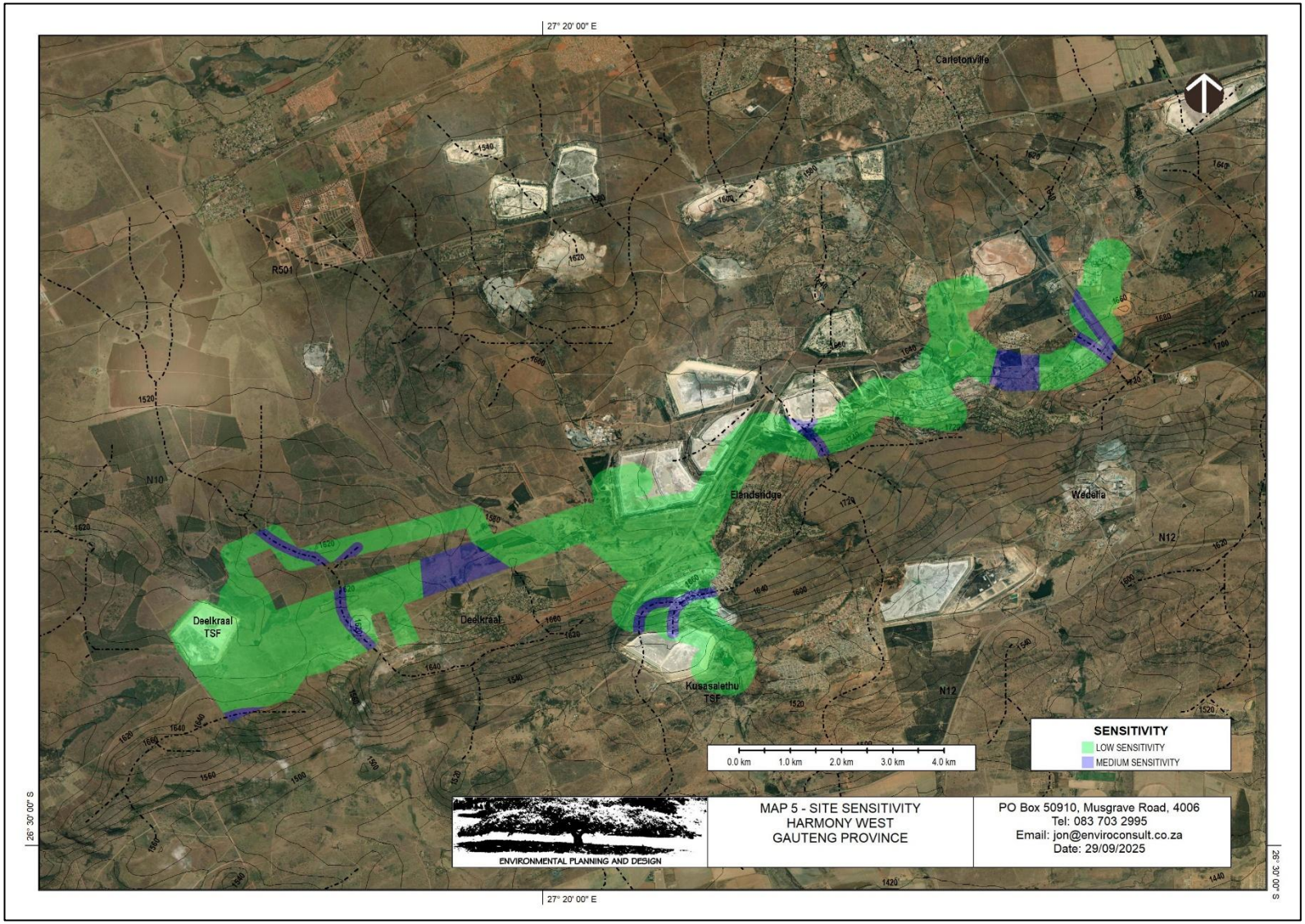
4.2.3 Medium Sensitivity Areas:

Medium Sensitive Areas include;

- **Areas of the project area adjacent to residential areas**. It is unlikely that these areas will be sensitive to the proposed project elements that are located within them. However, they could be sensitive to large scale site storage and / or contractor's camps.
- **Ridgeline Areas**, 100m buffer has been indicated of all ridgelines. It is unlikely that these areas will be sensitive to the proposed project elements that are located within them. However, they could be sensitive to large scale site storage and / or contractor's camps.

4.2.4 Low Sensitivity Areas:

All other areas within the potentially affected area have a low sensitivity.


27° 20' 00" E
Carletonville
R501
N10
Elandsridge
Wedela
N12
Deelkraal TSF
Deelkraal
Kusasalethu TSF
N12
SENSITIVITY
LOW SENSITIVITY
MEDIUM SENSITIVITY
0.0 km 1.0 km 2.0 km 3.0 km 4.0 km
ENVIRONMENTAL PLANNING AND DESIGN
MAP 5 - SITE SENSITIVITY
HARMONY WEST
GAUTENG PROVINCE
PO Box 50910, Musgrave Road, 4006
Tel: 083 703 2995
Email: jon@enviroconsult.co.za
Date: 29/09/2025
26° 30' 00" S
27° 20' 00" E

5 ASSESSMENT OF LIKELY LANDSCAPE AND VISUAL IMPACTS

This section provides an indication of the affected landscape associated with the development proposal. It highlights potential sensitive receptors, defines the Zones of Theoretical Visibility, assesses the impact of the proposed alignment.

5.1 VISIBILITY, ZTV ANALYSIS

Zones of Theoretical Visibility (ZTV) are defined as "a map usually digitally produced showing areas of land within which a development is theoretically visible[4]".

ZTV s of the proposed development have been assessed using a GIS viewshed tool.

The assessment is based on terrain data that has been derived from satellite imagery. This data was originally prepared by NASA and is freely available on the CIAT-CCAFS website (http://www.cgiar-csi.org). This data has been ground truthed using a GPS as well as an online mapping programme.

Whilst the ZTV has been calculated from terrain data only, existing vegetation and development could have a modifying effect on the areas indicated, however, given the nature of the landscape this is likely to be minimal.

The elements likely to be most visually obvious include:

The proposed Deelkraak II TSF and proposed overhead powerlines. The proposed pipelines are anticipated to be visible only from their immediate area.

Map 5 indicates the ZTV of the proposed Deelkraal II TSF.

Map 6 indicates the ZTV of the proposed overhead powerlines.

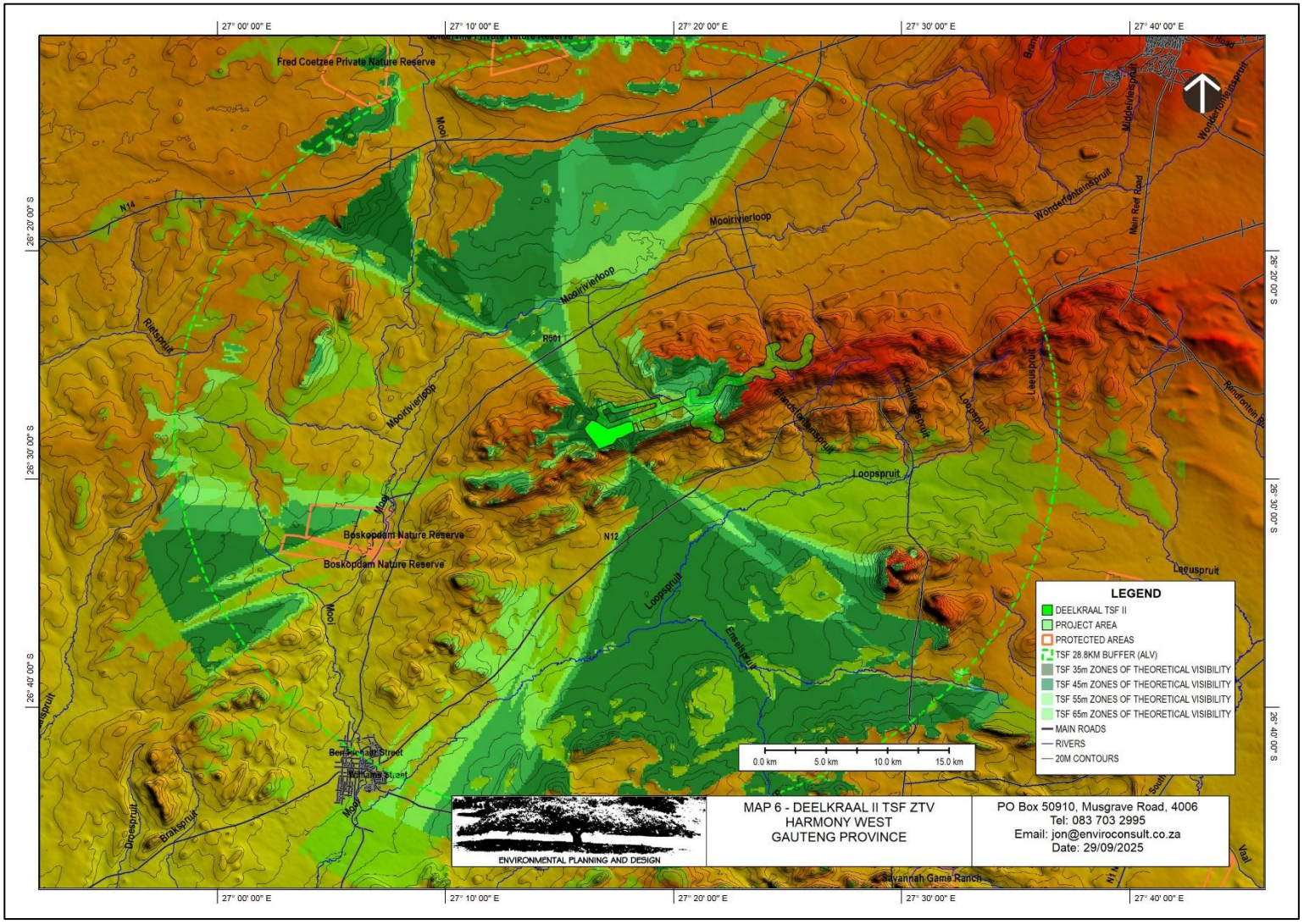
The ZTV analysis indicates that:

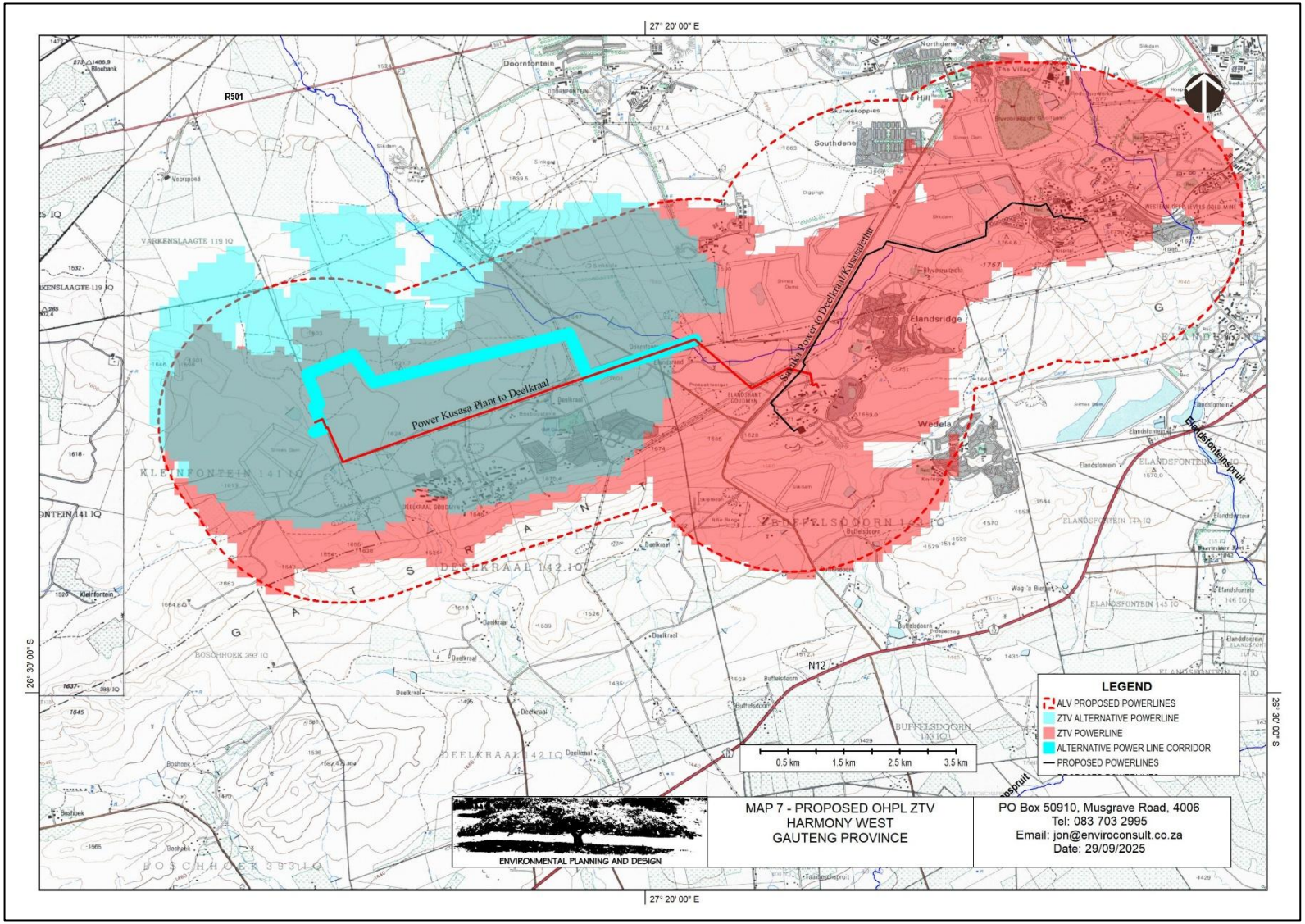
- Due to its height and adjacent valley lines, views of the proposed Deelkraal II TSF may be visible over flat areas to the north and south of the valley system in which it is located. The view corridors are likely to extent approximately 10km to the north and 5km south of the TSF. From these distances the view cone expands as the land rises and views become possible over the ridgelines enclosing the TSF.
- The Deelkraal II TSF could be visible to the Boskopdam Nature Reserve from a distance in excess of 17km. From this distance and particularly with rehabilitation, the top section of the proposed TSF may be visible but is unlikely to be discernible from surrounding hillsides.
- The Deelkraal II TSF could be visible from approximately 9km of the R501 to the north from a minimum distance of approximately 7.6km. From this distance and particularly with rehabilitation, the top section of the proposed TSF may be visible but is unlikely to be discernible from surrounding hillsides;
- The Deelkraal II TSF could be visible from approximately 15km of the N12 to the south from a minimum distance of approximately 6.5km. From this distance and

[4] UK Guidelines

particularly with rehabilitation, the top section of the proposed TSF may be visible but is unlikely to be discernible from surrounding hillsides;

- The Deelkraal II TSF could be visible from the mining villages of Deelkraal, Elandsridge and Wedelia. However, the extent of vegetation on the edges and within these settlement areas is likely to mean that views of the TSF from within the settlement areas are unlikely.
- The Deelkraal II TSF will be visible from the majority of internal mining roads within its limit of visibility. However, mine dumps are a common sight within this area;
- The proposed overhead powerline is likely to be visible to its approximate limit of visibility (2.5km) but is highly unlikely to be visible outside the valley system in which it is located;
- The proposed overhead powerline is likely to be visible to the entire area of the mining villages of Deelkraal, Elandsridge and Wedelia. However, the extent of vegetation on the edges and within these settlement areas is likely to mean that views of the powerline from within the settlement areas are unlikely;
- The proposed overhead powerline will be visible from all internal mining roads that it runs beside. However, medium voltage overhead powerlines are a common sight adjacent to these roads;
- The proposed pipelines are only likely to be visible from the roads that they run beside. The sight of similar pipelines is a common sight beside roads within the mine area.


27° 00' 00" E
27° 10' 00" E
27° 20' 00" E
27° 30' 00" E
27° 40' 00" E
26° 20' 00" S
26° 30' 00" S
26° 40' 00" S
Fred Coetzee Private Nature Reserve
Boskopdam Nature Reserve
Boskopdam Nature Reserve
Savannah Game Ranch
N14
N12
R501
Moolrivierloop
Loopspruit
Leeuspruit
Main Reef Road
Wonderfontein
Middelvleispruit
Wonderfonteinspruit
Roetspruit
Braakspruit
Doespruit
Leeuspruit
Etienkspruit
Vaal
LEGEND
DEELKRAAL TSF II
PROJECT AREA
PROTECTED AREAS
TSF 28.8KM BUFFER (ALV)
TSF 35m ZONES OF THEORETICAL VISIBILITY
TSF 45m ZONES OF THEORETICAL VISIBILITY
TSF 55m ZONES OF THEORETICAL VISIBILITY
TSF 65m ZONES OF THEORETICAL VISIBILITY
MAIN ROADS
RIVERS
20M CONTOURS
0.0 km
5.0 km
10.0 km
15.0 km
ENVIRONMENTAL PLANNING AND DESIGN
MAP 6 - DEELKRAAL II TSF ZTV
HARMONY WEST
GAUTENG PROVINCE
PO Box 50910, Musgrave Road, 4006
Tel: 083 703 2995
Email: jon@enviroconsult.co.za
Date: 29/09/2025


27° 20' 00" E
26° 30' 00" S
R501
Doornfontein
Southdene
Elandsridge
Wedela
Power Kusasa Plant to Deelkraal
Sandsloot Power to Deelkraal Kusasalethu
Elandsfonteinspruit
N12
0.5 km
1.5 km
2.5 km
3.5 km
LEGEND
ALV PROPOSED POWERLINES
ZTV ALTERNATIVE POWERLINE
ZTV POWERLINE
ALTERNATIVE POWER LINE CORRIDOR
PROPOSED POWERLINES
ENVIRONMENTAL PLANNING AND DESIGN
MAP 7 - PROPOSED OHPL ZTV
HARMONY WEST
GAUTENG PROVINCE
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Date: 29/09/2025

5.2 ASSESSMENT OF IMPACTS

5.2.1 Impacts to be Assessed

From the review of the proposed project and the nature of the affected landscape, the following possible landscape and visual impacts were identified:

a) Landscape change due to the proposed project;
b) Change in the character of views as experienced by travelers on main roads including the N12 and the R501;
c) Change in the character of views as experienced by travelers on local mine roads in close proximity to the proposed project;
d) Change in the character of views as experienced by residents of local mine villages including Elandsridge, Deelkraal and Wedeia;
e) Change in the character of views as experienced by visitors to the Deelkraal passive recreation area;
f) Change in the character of views as experienced by residents of homesteads within the areas to the north and south of the area of ridgelines and valleys; and
g) Lighting impacts.

5.2.2 Assessment Methodology

The assessment methodology used is as required by EIMS. The broad approach is indicated below. The detailed methodology is indicated in Appendix IV.

The broad approach to the significance rating methodology is to determine the significance (S) of an environmental risk or impact by considering the consequence (C) of each impact (comprising Nature, Extent, Duration, Magnitude, and Reversibility) and relating this to the probability/ likelihood (P) of the impact occurring. The S is determined for the pre- and post-mitigation scenario. In addition, other factors, including cumulative impacts and potential for irreplaceable loss of resources, are used to determine a prioritisation factor (PF) which is applied to the S to determine the overall final significance rating (FS). The impact assessment will be applied to all identified alternatives.

5.2.3 Assessment of Issues

5.2.3.1 The proposed development could change the character of the landscape (Landscape Change)

Construction Phase

Nature of impact: Construction works are likely to largely affect views from local mining roads.		
	Without mitigation	**With mitigation**
IMPACT SIGNIFICANCE		
Nature	Negative detrimental, **(-1)**	Negative detrimental, **(-1)**
Extent	Highly localised, **(1)**	Highly localised, **(1)**
Duration	Short term, **(2)**	Short term, **(2)**
Magnitude	Low **(2)**	Low **(2)**
Reversibility	Significant time and cost **(3)**	No significant time and cost **(2)**
Probability	Low **(2)**	Low **(2)**
Consequence	**(-2)**	**(1.75)**

Significance	Low - medium **(-4)**	Low **(-3.5)**

Mitigation / Management:

Construction:

- Locate storage areas and contractor's camps away from medium sensitive areas including entrances of residential areas, the Deelkraal passive recreation area and ridgelines;
- Control site access particularly during construction in order to minimise areas of disturbance particularly to areas of vegetation;
- Undertake waste management in order to minimise the spread of waste from the site;
- Reinstate, augment and maintain retained natural vegetation ;
- Remove all temporary works;
- Minimise disturbance and maintain existing vegetation and newly planted vegetation as far as is possible both within and surrounding the development area.

IMPACT PRIORITIZATION	
Cumulative Impact	Low **(1)**
Irreplaceable Loss	Low **(1)**
Prioritisation factor	**(1)**
Final Significance Rating	**(-2.35)**
	Low Negative

Cumulative Impacts:

The proposed project will add to disturbance and the sight of mining infrastructure within the mining area.

Operational Phase

Nature of impact:

The proposed Deelkraal II TSF is likely to be visible to rural areas to the north and south of the series of ridgelines and valleys within which mining operations are focused. However, it is unlikely to be highly obvious due to the distance of views and the fact that only the top of the TSF is likely to be visible which is unlikely to be visually discernible from surrounding ridgelines.

The proposed overhead powerlines and pipelines are only likely to be visible from within the mining area within which these infrastructure elements are a relatively common sight.

It also needs to be stated that even outside the project area and within the rural areas to the north and south of the proposed project, mining operations including spoil heaps are a relatively common sight.

	Without mitigation	**With mitigation**
IMPACT SIGNIFICANCE		
Nature	Negative detrimental, **(-1)**	Negative detrimental, **(-1)**
Extent	Local, **(3)**	Local, **(3)**

Duration	Medium term, **(3)**	Short term, **(2)**
Magnitude	Low **(3)**	Low **(2)**
Reversibility	Significant time and cost **(3)**	Significant time and cost **(3)**
Probability	Low **(2)**	Low **(2)**
Consequence	**(-3)**	**(-2.5)**
Significance	medium **(-6)**	Very Low **(-5)**

Mitigation / Management:

Operation:

- Reinstate, augment and maintain retained natural vegetation ;
- Monitor rehabilitated areas post-construction and implement remedial actions;
- Undertake rehabilitation of the TSF on an incremental basis in order to help the side slopes of the facility blend visually with the surrounding landform; and
- Maintain existing vegetation and newly planted vegetation as far as is possible both within and surrounding the development area.

IMPACT PRIORITIZATION	
Cumulative Impact	Medium **(2)**
Irreplaceable Loss	Low **(1)**
Prioritisation factor	Medium **(1.25)**
Final Significance Rating	Medium Low **(-5.625)**

Cumulative Impacts:

The proposed project will add to mining infrastructure that is visible within the mining area. It will also marginally add to views of tailings storage facilities that could be visible from rural areas to the north and south of the mining area.

5.2.3.2 The proposed development could change the character of the landscape as viewed from Main Roads (N12 and R501)

Construction Phase

Nature of impact:

Construction works will not be visible from these roads. There will be no visual impact.

Operational Phase

Nature of impact:

The proposed Deelkraal II TSF is likely to be visible to sections of these roads. It is likely to be visible to greater sections of these roads as it nears its final height.

The degree to which is will be obvious may be mitigated by undertaking early rehabilitation of site slopes helping them blend visually with the surrounding landform

	Without mitigation	**With mitigation**
IMPACT SIGNIFICANCE		

Nature	Negative detrimental, **(-1)**	Negative detrimental, **(-1)**
Extent	Local, **(3)**	Local, **(3)**
Duration	Medium term, **(3)**	Short term, **(2)**
Magnitude	Low **(3)**	Low **(2)**
Reversibility	Significant time and cost **(3)**	Significant time and cost **(3)**
Probability	Low **(2)**	Low **(2)**
Consequence	**(-3)**	**(-2.5)**
Significance	Low - medium **(-6)**	Low - medium **(-5)**
Mitigation / Management: **Operation**: • Undertake rehabilitation of the TSF on an incremental basis in order to help the side slopes of the facility blend visually with the surrounding landform; and • Reinstate, augment and maintain natural vegetation.		
IMPACT PRIORITIZATION		
Cumulative Impact	Medium **(2)**	
Irreplaceable Loss	Low **(1)**	
Prioritisation factor	Medium **(1)**	
Final Significance Rating	Medium Low **(-5)**	
Cumulative Impacts: The proposed project will mainly add to mining infrastructure that is visible within the mining area. The TSF may be visible from these roads which could increase the extent of similar facilities that are visible.		

5.2.3.3 Change in the character of views as experienced by travelers on local mine roads in close proximity to the proposed project

Construction Phase

Nature of impact: Construction works are only likely to affect views from local mining roads.		
	Without mitigation	**With mitigation**
IMPACT SIGNIFICANCE		
Nature	Negative detrimental, **(-1)**	Negative detrimental, **(-1)**
Extent	Localised, **(2)**	Highly localised, **(1)**
Duration	Short term, **(2)**	Short term, **(2)**
Magnitude	Low **(2)**	Low **(2)**
Reversibility	Significant time and cost **(3)**	No significant time and cost **(2)**
Probability	Low **(2)**	Low **(2)**
Consequence	**(-2.25)**	**(1.75)**
Significance	Low - medium **(-4.5)**	Low **(-3.35)**

Mitigation / Management: **Construction**: • Locate storage areas and contractor's camps away from medium sensitive areas including entrances of residential areas, the Deelkraal passive recreation area and ridgelines; • Control site access particularly during construction in order to minimise areas of disturbance particularly to areas of vegetation; • Undertake waste management in order to minimise the spread of waste from the site; and • Minimise disturbance and maintain existing vegetation and newly planted vegetation as far as is possible both within and surrounding the development area.

IMPACT PRIORITIZATION	
Cumulative Impact	Low **(1)**
Irreplaceable Loss	Low **(1)**
Prioritisation factor	**(1)**
Final Significance Rating	**(-3.35)** Low Negative

Cumulative Impacts: The proposed project will add to disturbance and the sight of mining infrastructure within the mining area.

Operational Phase

Nature of impact: The proposed TSF, overhead powerlines and pipelines are likely to be visible from within the mining area within which these infrastructure elements are a relatively common sight.

	Without mitigation	**With mitigation**
IMPACT SIGNIFICANCE		
Nature	Negative detrimental, **(-1)**	Negative detrimental, **(-1)**
Extent	Site, **(2)**	Site, **(2)**
Duration	Long term, **(4)**	Long term, **(4)**
Magnitude	Low **(3)**	Minor **(1)**
Reversibility	Significant time and cost **(3)**	Significant time and cost **(3)**
Probability	Medium **(3)**	Low **(2)**
Consequence	**(-4)**	**(-2.5)**
Significance	medium **(-12)**	Low **(-5.0)**

Mitigation / Management: **Operation**: • Reinstate, augment and maintain retained natural vegetation ;

• Monitor rehabilitated areas post-construction and implement remedial actions; • Undertake rehabilitation of the TSF on an incremental basis in order to help the side slopes of the facility blend visually with the surrounding landform; and • Maintain existing vegetation and newly planted vegetation as far as is possible both within and surrounding the development area.

IMPACT PRIORITIZATION	
Cumulative Impact	Low **(1)**
Irreplaceable Loss	Low **(1)**
Prioritisation factor	Medium **(1)**
Final Significance Rating	Medium Low **(-5.0)**
Cumulative Impacts: The proposed project will add to mining infrastructure that is visible within the mining area.	

5.2.3.4 The proposed development could change the character of the landscape as viewed from the Boskopdam Nature Reserve

Construction Phase

Nature of impact: Construction works will not be visible from the Boskopdam Nature Reserve. There will be no visual impact.

Operational Phase

Nature of impact: The proposed Deelkraal II TSF is un-likely to be visible to this reserve until it is nearing its ultimate height. The TSF is unlikely to be highly visually obvious from the Reserve due to distance. The degree to which is will be obvious may also be mitigated by undertaking early rehabilitation of side slopes helping them blend visually with the surrounding ridgelines.

	Without mitigation	**With mitigation**
IMPACT SIGNIFICANCE		
Nature	Negative detrimental, **(-1)**	Negative detrimental, **(-1)**
Extent	Local, **(3)**	Local, **(3)**
Duration	Medium term, **(3)**	Short term, **(2)**
Magnitude	Low **(2)**	Minor **(1)**
Reversibility	No significant time and cost **(2)**	No significant time and cost **(2)**
Probability	Low **(2)**	Low **(2)**
Consequence	**(-2.5)**	**(-2.0)**

Significance	Low - medium **(-6)**	Low - medium **(-4)**
Mitigation / Management: **Operation**: • Undertake rehabilitation of the TSF on an incremental basis in order to help the side slopes of the facility blend visually with the surrounding landform.		
IMPACT PRIORITIZATION		
Cumulative Impact	Low **(1)**	
Irreplaceable Loss	Low **(1)**	
Prioritisation factor	Medium **(1.25)**	
Final Significance Rating	Medium Low **(-5)**	
Cumulative Impacts: The proposed project will mainly add to mining infrastructure that is visible within the mining area. The TSF is unlikely to be visually obvious from the Reserve and is unlikely to increase the extent of mining operations that are visible.		

5.2.3.5 The proposed development could Change in the character of views as experienced by visitors to the Deelkraal Passive Recreation Area

Construction period

Nature of impact: Construction works are only likely to largely affect views from local mining roads. It is also likely that some minor works could be visible from the recreation area.		
	Without mitigation	**With mitigation**
IMPACT SIGNIFICANCE		
Nature	Negative detrimental, **(-1)**	Negative detrimental, **(-1)**
Extent	Highly localised, **(1)**	Highly localised, **(1)**
Duration	Short term, **(2)**	Short term, **(2)**
Magnitude	Moderate **(3)**	Low **(2)**
Reversibility	Significant time and cost **(3)**	No significant time and cost **(2)**
Probability	Low **(2)**	Low **(2)**
Consequence	**(-2.25)**	**(1.75)**
Significance	Low - medium **(-4.5)**	Low **(-3.35)**
Mitigation / Management: **Construction**: • Locate storage areas and contractor's camps away from medium sensitive areas including entrances of residential areas, the Deelkraal passive recreation area and ridgelines; • Control site access particularly during construction in order to minimise areas of disturbance particularly to areas of vegetation;		

• Undertake waste management in order to minimise the spread of waste from the site; and • Minimise disturbance, maintain and augment existing vegetation and maintain newly planted vegetation as far as is possible both within and surrounding the development area.	
IMPACT PRIORITIZATION	
Cumulative Impact	Low **(1)**
Irreplaceable Loss	Low **(1)**
Prioritisation factor	**(1)**
Final Significance Rating	**(-3.35)** Low Negative
Cumulative Impacts: The proposed project will add to disturbance and the sight of mining infrastructure from the recreation area.	

Operational period

Nature of impact: The proposed TSF, overhead powerlines and pipelines are likely to be visible from within the recreation area however these infrastructure elements are a relatively common sight in the vicinity.		
	Without mitigation	**With mitigation**
IMPACT SIGNIFICANCE		
Nature	Negative detrimental, **(-1)**	Negative detrimental, **(-1)**
Extent	Site, **(2)**	Site, **(2)**
Duration	Long term, **(4)**	Long term, **(4)**
Magnitude	Low **(3)**	Minor **(1)**
Reversibility	Significant time and cost **(3)**	Significant time and cost **(3)**
Probability	Medium **(3)**	Medium **(3)**
Consequence	**(-4)**	**(-2.5)**
Significance	medium **(-12)**	Low **(-7.5)**
Mitigation / Management: **Operation**: • Reinstate, augment and maintain retained natural vegetation ; • Monitor rehabilitated areas post-construction and implement remedial actions; • Undertake rehabilitation of the TSF on an incremental basis in order to help the side slopes of the facility blend visually with the surrounding landform; and • Maintain existing vegetation and newly planted vegetation as far as is possible both within and surrounding the development area.		
IMPACT PRIORITIZATION		
Cumulative Impact	Medium **(2)**	

Irreplaceable Loss	Low **(1)**
Prioritisation factor	Medium **(1)**
Final Significance Rating	Medium Low **(-7.5)**
Cumulative Impacts: The proposed project will add to mining infrastructure that is visible from within the recreation area.	

5.2.3.6 The proposed development could Change in the character of views as experienced by residents of local mine villages including Elandsridge, Deelkraal and Wedelia

Construction Phase

Nature of impact: It is unlikely that extensive views of construction any of the project elements will be possible from within the residential villages. It is possible however, that small views could be possible from the residences on the edges facing towards the proposed project.		
	Without mitigation	**With mitigation**
IMPACT SIGNIFICANCE		
Nature	Negative detrimental, **(-1)**	Negative detrimental, **(-1)**
Extent	Site, **(2)**	Site, **(2)**
Duration	Short term, **(2)**	Short term, **(2)**
Magnitude	Low **(2)**	Minor **(1)**
Reversibility	No significant time and cost **(2)**	No significant time and cost **(2)**
Probability	Low **(2)**	Improbable **(1)**
Consequence	Medium **(-2)**	Medium **(-1.75)**
Significance	Low **(-4)**	Low **(-1.75)**
Mitigation / Management: • Minimise disturbance; • Retain and augment existing vegetation; • Monitor rehabilitated areas post-construction and implement remedial actions; • Maintain existing vegetation and newly planted vegetation as far as is possible both within and surrounding the development area; and • Locate storage areas and contractor's camps outside areas with medium sensitivity and away from mine villages.		
IMPACT PRIORITIZATION		
Cumulative Impact	Low **(1)**	
Irreplaceable Loss	Low **(1)**	

Prioritisation factor	**(1)**
Final Significance Rating	Low negative **(-1.75)**
Cumulative Impacts: Minor intensification of views of mining infrastructure and disturbance.	

Operational Phase

Nature of impact: It is unlikely that extensive views of any of the project elements will be possible from within the residential mine villages. It is possible however, that small views could be possible from the residences on the edges facing towards the proposed project.		
	Without mitigation	**With mitigation**
IMPACT SIGNIFICANCE		
Nature	Negative detrimental, **(-1)**	Negative detrimental, **(-1)**
Extent	Site, **(2)**	Site, **(2)**
Duration	Long term, **(4)**	Long term, **(4)**
Magnitude	Low **(2)**	Minor **(1)**
Reversibility	No significant time and cost **(2)**	No significant time and cost **(2)**
Probability	Low **(2)**	Improbable **(1)**
Consequence	Medium **(-2.5)**	Medium **(-2.25)**
Significance	Very Low **(-5)**	Very Low **(-2.25)**
Mitigation / Management: • Monitor rehabilitated areas post-construction and implement remedial actions; • Undertake rehabilitation of the TSF on an incremental basis in order to help the side slopes of the facility blend visually with the surrounding landform; and • Locate storage areas and contractor's camps outside areas with medium sensitivity and away from mine villages.		
IMPACT PRIORITIZATION		
Cumulative Impact	Low **(1)**	
Irreplaceable Loss	Low **(1)**	
Prioritisation factor	**(1)**	
Final Significance Rating	Low negative **(-1.75)**	
Cumulative Impacts: Minor intensification of views of mining infrastructure.		

5.2.3.7 Change in the character of views as experienced by residents of homesteads within the areas to the north and south of the area of ridgelines and valleys

Construction Phase

Nature of impact:
Construction works will not be visible from these homesteads. There will be no visual impact.

Operational Phase

Nature of impact:		
The proposed Deelkraal II TSF is likely to be visible but is unlikely to be visually obvious. It is possible to be visible to greater numbers of homesteads as it nears its final height. The degree to which is will be obvious may be mitigated by undertaking early rehabilitation of side slopes helping them blend visually with the surrounding landform.		
	Without mitigation	**With mitigation**
IMPACT SIGNIFICANCE		
Nature	Negative detrimental, **(-1)**	Negative detrimental, **(-1)**
Extent	Local, **(3)**	Local, **(3)**
Duration	Medium term, **(3)**	Short term, **(2)**
Magnitude	Low **(3)**	Low **(2)**
Reversibility	Significant time and cost **(3)**	Significant time and cost **(3)**
Probability	Low **(2)**	Low **(2)**
Consequence	**(-3)**	**(-2.5)**
Significance	Low - medium **(-6)**	Low - medium **(-5)**
Mitigation / Management: **Operation**: • Undertake rehabilitation of the TSF on an incremental basis in order to help the side slopes of the facility blend visually with the surrounding landform.		
IMPACT PRIORITIZATION		
Cumulative Impact	Medium **(2)**	
Irreplaceable Loss	Low **(1)**	
Prioritisation factor	Medium **(1)**	
Final Significance Rating	Medium Low **(-5)**	
Cumulative Impacts: The proposed project will mainly add to mining infrastructure that is visible within the mining area. The TSF may be visible from these roads which could increase the extent of similar facilities that are visible.		

5.2.3.8 Lighting within the proposed development could cause light pollution and nuisance for neighbours

Construction Phase

Nature of impact:

The environment surrounding the proposed facility is not dark at night. Existing lighting is typically comprised of:

- Low intensity lighting associated with individual dwellings;
- Bright lighting associated with mining operations; and
- Vehicle lights that may be driving through the area.

Lighting associated with the proposed construction phase could include:

- Temporary security and safety lighting;

If this is not designed appropriately, it is possible that lighting could create nuisance for local people.

	Without mitigation	With mitigation
IMPACT SIGNIFICANCE		
Nature	Negative detrimental, **(-1)**	Negative detrimental, **(-1)**
Extent	Site, **(2)**	Site, **(2)**
Duration	Immediate, **(1)**	Immediate, **(1)**
Magnitude	Moderate **(3)**	Minor **(1)**
Reversibility	Minimal time and cost **(1)**	Minimal time and cost **(1)**
Probability	Low **(2)**	Improbable **(1)**
Consequence	Low **(-1.75)**	Low **(-1.25)**
Significance	Low **(-3.50)**	Low **(-1.25)**

Mitigation / Management:

Planning:

- Careful design of security and operational lighting to minimise impacts on surrounding areas and receptors;
- High mast lighting should not be used.

Construction:

- Ensure that the intention of the original lighting design is maintained throughout the construction phase.

IMPACT PRIORITIZATION	
Cumulative Impact	Low **(1)**
Irreplaceable Loss	Low **(1)**
Prioritisation factor	Low **(1)**
Final Significance Rating	Low negative **(1.25)**

Cumulative Impacts:
Construction lighting is likely to marginally intensify the existing impact of lighting within its vicinity. However, this will be a localised and is unlikely to extend the cumulative effect of lighting.

Operational Phase

Nature of impact:
Lighting associated with the proposed development could include:

- Security and operational lighting within the proposed Deelkraal TSF

The proposed Deelkraal TSF is approximately 1km from the nearest possible receptor, the Deekraal Mining Village and the Deelkraal Passive Recreation Area. At this distance it is possible for misdirected lighting to cause a nuisance. However, it is relatively easy to ensure that lighting is not misdirected towards the residential and recreational area.

	Without mitigation	**With mitigation**
IMPACT SIGNIFICANCE		
Nature	Negative detrimental, **(-1)**	Negative detrimental, **(-1)**
Extent	Site, **(2)**	Site, **(2)**
Duration	Immediate, **(1)**	Immediate, **(1)**
Magnitude	Moderate **(3)**	Minor **(1)**
Reversibility	Minimal time and cost **(1)**	Minimal time and cost **(1)**
Probability	Low **(2)**	Improbable **(1)**
Consequence	Low **(-1.75)**	Low **(-1.25)**
Significance	Low **(-3.50)**	Low **(-1.25)**

Mitigation / Management:
Planning:

- Careful design of security and operational lighting to minimise impacts on surrounding areas and receptors particularly the Deelkraal Mining Village and Passive Recreation Area;
- Ensure that security lighting is only activated when necessary, the use of movement sensors and / or infra-red systems should be considered;
- High mast lighting should not be used.

Operation:

- Ensure that the intention of the original lighting design is maintained throughout the operational phase.

IMPACT PRIORITIZATION	
Cumulative Impact	Low **(1)**
Irreplaceable Loss	Low **(1)**
Prioritisation factor	Low **(1)**
Final Significance Rating	Low negative **(1.25)**

Cumulative Impacts:

Substation
The substation is likely to intensify the existing impact of lighting within its vicinity. However, this will be a localised and is unlikely to extend the cumulative effect of lighting.

5.3 CONSIDERATION OF ALTERNATIVES

5.3.1 Alternative Deposition Areas

The brief calls for a "high level" consideration of the use of the Old Savuka Footprints and the DF5 Footprint (Refer to Map 2).

If it is possible that these facilities might be used for the deposition of material that might reduce the height of the Deelkraal II TSF, from a visual perspective this may be beneficial as it is likely to reduce possible impacts on areas to the north and south of the mining area.

It is noted that additional filling of the Old Savuka Footprints and the DF5 Footprint is likely to increase visibility of TSFs in other areas. If this alternative proves feasible, it is suggested that an impact comparison is prepared. In order to undertake this comparison it would be necessary to understand the extent to which the height of these alternative TSFs would need to increase for a significant reduction in the Deelkraal II to be possible.

In order to provide an indication of the level of likely benefit, Map 6 which indicates the ZTV analysis of the proposed Deelkraal II TSF considers deposition at 65m, 55m, 45m and 35m depth. It is noted that

Map 6 indicates that the maximum reduction in visibility is gained when a 35m high TSF is considered. The lower TSF significantly reduces the area over which it may be visible to the north and south. With deposition at 35m, views of the TSF being visible from the Boskopdam Protected Area are also largely prevented.

5.3.2 Alternative Powerline Alignment

The brief calls for consideration of the use of an Alternative Power Line Alignment (Alternative 2) to the east of the Deelkraal HT Substation (Refer to Map 2).

A ZTV analysis of both Alternative 1 and Alternative 2 alignments have been considered (Map 7).

Alternative 2 is aligned across higher ground than Alternative 1 which is likely to make it potentially visible over a greater area making Alternative 1 favoured from a landscape and visual perspective. However, given the general low visibility of the proposed powerlines, both alternatives are acceptable.

6 IMPACT STATEMENT

6.1 EXISTING LANDSCAPE

The following Landscape Character Areas (**LCA**s) were identified:

- **The area of east / west aligned ridgelines and valleys** within which the proposed project is located that includes the following landscape characteristic;
    - Valley slopes and ridgelines that are steep relative to areas directly to the north and south;
    - A mix of alien trees including plantations within indigenous grassland areas;
    - Mining areas including infrastructure, waste and extraction sites; and
    - Formal housing areas that are largely associated with mining operations.
- **The area to the north of the ridgelines** that includes the following landscape characteristics;
    - Relatively flat topography;
    - Areas of housing development that are largely high density housing and medium rise blocks that appear relatively new and under development and
    - Areas of commercial cultivation and grazing within a matrix of natural grassland and stands of alien trees.
- **The area to the south of the east / west aligned ridgelines and valleys** that includes the following landscape characteristics;
    - Relatively flat topography;
    - Residential settlement largely in the form of individual homesteads; and
    - Areas of commercial cultivation and grazing within a matrix of natural grassland and stands of alien trees.

There is only one protected area, the Boskopdam Nature Reserve that is located approximately 16km west of the proposed project. The assessment indicates that whilst a small upper section of the Deelkraal II TSF may be visible, it is unlikely to be visually discernible from adjacent ridgelines and hillsides.

6.2 VISUAL RECEPTORS

- **Deelkraal, Elandsridge and Wedelia** are small mining settlement that is located within the area of ridgelines and valleys and within 1km of the proposed Deelkraal II TSF. Elandsridge is located in the vicinity of proposed pipeline and overhead power line routes and is approximately 6.2km from the proposed Deelkraal TSF;
- **The Boskop Dam Nature Reserve** that is located approximately 16km to the west of the proposed project; and
- **A Passive Recreation Area** immediately north of Deelkraal.

Linear Receptors

- **The R501** which is the main road running through the area to the north of the proposed project. This road connects Carletonville to the north-east with Potchesfstroom to the south-west; and
- **The N12** which runs through the area to the south of the proposed project. This road connects Potchesftroom to the south-west with Soweto and the greater Johannesburg area to the east.

- **Minor roads** that run through the area of ridgelines and valleys within which the proposed project is located. These roads are largely used by local people and for mine access.

Point Receptors

- **Individual homesteads** particularly those located in the area to the south of the proposed project area.

6.3 LANDSCAPE & RECEPTOR SENSITIVITY

SENSITIVITY	LCA	RECEPTORS
Low	Areas not recognised as having specific landscape value; • **The area of east / west aligned ridgelines and valleys.**	Viewer's attention not focused on landscape. These include: • **Travellers on minor roads including unsurfaced roads.**
Medium	Landscape value is recognised locally, but is not protected; the landscape is relatively intact, with a distinctive character; and the landscape is reasonably tolerant of change. These areas include: • **The flat, rural LCAs to the north and south of the east / west aligned ridgelines and valleys**	Viewers' attention may be focused on landscape. These include: • **Mining Village Settlements including Deelkraal, Elandsridge and Wedelia;** • **Travellers on main roads including the R501 and the N12; and** • **Individual homesteads.**
High	The qualities for which the landscape is valued are in a good condition, with a clearly apparent distinctive character. This distinctive character is susceptible to relatively small changes. **There are no landscape character areas with a high significance.**	Viewer's attention very likely to be focused on landscape, e.g. people experiencing views from important landscape features of local physical, cultural or historic interest and beauty spots. Large number of viewers and/or location in a highly valued landscape could elevate viewer sensitivity to the highest level. **Visitors to the Boskopdam Nature Reserve and visitors to the Deelkraal Passive Recreation Area.**

6.4 LIKELY VISIBILITY AND POSSIBLE LANDSCAPE AND VISUAL IMPACTS

From review of the ZTV analysis, the following was noted;

- Due to its height and adjacent valley lines, views of the proposed Deelkraal II TSF may be visible over flat areas to the north and south of the valley system in which it is located. The view corridors are likely to extent approximately 10km to the north and 5km south of the TSF. From these distances the view cone expands as the land rises and views become possible over the ridgelines enclosing the TSF.
- The Deelkraal II TSF could be visible to the Boskopdam Nature Reserve from a distance in excess of 17km. From this distance and particularly with rehabilitation, the top section of the proposed TSF may be visible but is unlikely to be discernible from surrounding hillsides.
- The Deelkraal II TSF could be visible from approximately 9km of the R501 to the north from a minimum distance of approximately 7.6km. From this distance and particularly with rehabilitation, the top section of the proposed TSF may be visible but is unlikely to be discernible from surrounding hillsides;
- The Deelkraal II TSF could be visible from approximately 15km of the N12 to the south from a minimum distance of approximately 6.5km. From this distance and particularly with rehabilitation, the top section of the proposed TSF may be visible but is unlikely to be discernible from surrounding hillsides;
- The Deelkraal II TSF could be visible from the mining villages of Deelkraal, Elandsridge and Wedelia. However, the extent of vegetation on the edges and within these settlement areas is likely to mean that views of the TSF from within the settlement areas are unlikely.
- The Deelkraal II TSF will be visible from the majority of internal mining roads within its limit of visibility. However, mine dumps are a common sight within this area;
- The proposed overhead powerline is likely to be visible to its approximate limit of visibility (2.5km) but is highly unlikely to be visible outside the valley system in which it is located;
- The proposed overhead powerline is likely to be visible to the entire area of the mining villages of Deelkraal, Elandsridge and Wedelia. However, the extent of vegetation on the edges and within these settlement areas is likely to mean that views of the powerline from within the settlement areas are unlikely;
- The proposed overhead powerline will be visible from all internal mining roads that it runs beside. However, medium voltage overhead powerlines are a common sight adjacent to these roads;
- The proposed pipelines are only likely to be visible from the roads that they run beside. The sight of similar pipelines is a common sight beside roads within the mine area.

From the review of the proposed project, the nature of the affected landscape and possible receptors, the following possible landscape and visual impacts were identified:

a) Landscape change due to the proposed project;
b) Change in the character of views as experienced by travelers on main roads including the N12 and the R501;
c) Change in the character of views as experienced by travelers on local mine roads in close proximity to the proposed project;

d) Change in the character of views as experienced by residents of local mine villages including Elandsridge, Deelkraal and Wedeia;
e) Change in the character of views as experienced by visitors to the Deelkraal passive recreation area;
f) Change in the character of views as experienced by residents of homesteads within the areas to the north and south of the area of ridgelines and valleys; and
g) Lighting impacts.

Landscape change due to the proposed project
Construction works are likely to largely affect views from local mining roads.

During the Operational Phase, the proposed Deelkraal II TSF is likely to be visible to rural areas to the north and south of the series of ridgelines and valleys within which mining operations are focused. However, it is unlikely to be highly obvious due to the distance of views and the fact that only the top of the TSF is likely to be visible which is unlikely to be visually discernible from surrounding ridgelines.

The proposed overhead powerlines and pipelines are only likely to be visible from within the mining area within which these infrastructure elements are a relatively common sight.

It also needs to be stated that even outside the project area and within the rural areas to the north and south of the proposed project, mining operations including spoil heaps are a relatively common sight.

With mitigation measures Landscape Impacts were assessed as likely to have an impact of Low Negative significance during Construction and an impact of Medium Low Negative significance during the Operational Phase. The difference is due to the likelihood that the Deelkraal II TSF is ultimately likely to be visible from areas outside the series of ridgelines within which the project is located.

Change in the character of the landscape as viewed from Main Roads (N12 and R501)
Construction works are likely to largely affect views from local mining roads.

During the operational phase, the proposed Deelkraal II TSF is likely to be become visible to rural areas to the north and south of the series of ridgelines and valleys within which mining operations are focused. However, it is unlikely to be highly obvious due to the distance of views and the fact that only the top of the TSF is likely to be visible which is unlikely to be visually discernible from surrounding ridgelines.

The proposed overhead powerlines and pipelines are only likely to be visible from within the mining area within which these infrastructure elements are a relatively common sight. It also needs to be stated that even outside the project area and within the rural areas to the north and south of the proposed project, mining operations including spoil heaps are a relatively common sight.

The visual impact was assessed as likely to have No Impact during construction and a Medium-Low significance during the operational phase of the project.

Change in the character of the landscape as viewed from local mine roads

The proposed TSF, overhead powerlines and pipelines are likely to be visible from within the mining area within which these infrastructure elements are a relatively common sight.

The proposed project will add to disturbance and the sight of mining infrastructure within the mining area.

The visual impact was assessed as likely to have and impact of Low Significance during construction and a Medium-Low Significance during the operational phase of the project.

Change in the character of the landscape as viewed from the Boskopdam Nature Reserve

During construction the proposed project will not be visible from the Boskopdam Nature Reserve.

During the operational phase, the proposed Deelkraal II TSF is likely to be become visible as the facility nears its ultimate height. However, it is unlikely to be highly obvious due to the distance of views and the fact that only the top of the TSF is unlikely to be visually discernible from surrounding ridgelines within which it may be seen.

The visual impact was assessed as likely to have No Impact during construction and a Medium-Low Significance during the operational phase of the project.

Change in the character of the landscape as viewed from the Deelkraal Passive Recreation Area

During construction the proposed project will not be visible from the Boskopdam Nature Reserve.

The proposed project will add to disturbance and the sight of mining infrastructure from the recreation area during the Construction Phase.

During the Operational Phase, the proposed TSF, overhead powerlines and pipelines are likely to be visible from within the recreation area however these infrastructure elements are a relatively common sight in the vicinity.

The visual impact was assessed as likely to have a significance of Low Negative Significance during construction and a Medium-Low Significance during the Operational Phase of the project.

Change in the character of the landscape as viewed by residents of the local mine villages including Elandsridge, Deelkraal and Wedelia

It is unlikely that extensive views of construction any of the project elements will be possible from within the residential villages. It is possible however, that small views could be possible from the residences on the edges facing towards the proposed project.

During the Operational Phase it is also unlikely that extensive views of any of the project elements will be possible from within the residential mine villages. It is possible however, that small views could be possible from the residences on the edges facing towards the proposed project.

The visual impact was assessed as likely to have a significance of Low Negative Significance both during the construction and the Operational Phase of the project.

Change in the character of views as experienced by residents of homesteads within the areas to the north and south of the area of ridgelines and valleys.
During construction the proposed project will not be visible from these homesteads.

During the Operational Phase, the proposed Deelkraal II TSF is likely to be visible but is unlikely to be visually obvious. It is possible to be visible to greater numbers of homesteads as it nears its final height.

The degree to which is will be obvious may be mitigated by undertaking early rehabilitation of side slopes helping them blend visually with the surrounding landform.

There will be no impact during the Construction Phase.

During the Operational Phase the assessment indicates that the proposed project is likely to have an impact with a Medium Low Significance.

Lighting impacts
Lighting impacts during both the construction and operational phases of the proposed project was assessed as likely to have a Low Negative visual impacts.

6.5 CONSIDERATION OF ALTERNATIVES

6.5.1 Alternative Deposition Areas
The brief calls for a "high level" consideration of the use of the Old Savuka Footprints and the DF5 Footprint.

The assessment indicates that it is possible that there could be landscape and visual benefits for the use of these areas assuming that this would reduce the height of the Deelkraal II TSF.

Without knowing the possible capacity of these areas and confirmation that this would proportionally reduce the height of the proposed Deelkraal II TSF. It is not possible to confirm the degree of possible benefit.

6.5.2 Alternative Powerline Alignments
The brief calls for consideration of the use of an Alternative Power Line Alignment (Alternative 2) to the east of the Deelkraal HT Substation.

Alternative 2 is aligned across higher ground than Alternative 1 which is likely to make it potentially visible over a greater area making Alternative 1 favoured from a landscape and visual perspective. However, given the general low visibility of the proposed powerlines, both alternatives are acceptable.

6.6 CONCLUSION
As long as the identified mitigation measures are used, due to the likely relatively low levels of landscape and visual impact and the degraded nature of the affected landscape, there is no reason from a landscape and visual impact perspective why the proposed development should not be authorised.

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APPENDIX I

SPECIALIST'S BRIEF CV



Name	JONATHAN MARSHALL
Nationality	British
Year of Birth	1956
Specialisation	Landscape Architecture / Landscape & Visual Impact Assessment / Environmental Planning / Environmental Impact Assessment.
Qualifications	
Education	Diploma in Landscape Architecture, Gloucestershire College of Art and Design, UK (1979) Environmental Law, University of KZN (1997)
Professional	Registered Professional Landscape Architect (SACLAP)

Languages	English	-	Speaking	-	Excellent
		-	Reading	-	Excellent
		-	Writing	-	Excellent

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General

Jon qualified as a Landscape Architect (Dip LA) at Cheltenham (UK) in 1979. He became a chartered member of the Landscape Institute UK in 1986. He is a Registered Landscape Architect and has had extensive experience as an Environmental Assessment Practitioner within South Africa.

During the early part of his career (1981 - 1990) He worked with Clouston (now RPS) in Hong Kong and Australia. During this period he was called on to undertake visual impact assessment (VIA) input to numerous environmental assessment processes for major infrastructure projects. This work was generally based on photography with line drawing superimposed to illustrate the extent of development visible.

He has worked in the United Kingdom (1990 - 1995) for major supermarket chains including Sainsbury's and prepared CAD based visual impact assessments for public enquiries for new store development. He also prepared the VIA input to the environmental statement for the Cardiff Bay Barrage for consideration by the UK Parliament in the passing of the Barrage Act (1993).

His more recent VIA work (1995 to present) includes a combination of CAD and GIS based work for a new international airport to the north of Durban, new heavy industrial operations, overhead electrical transmission lines, mining operations in West Africa and numerous commercial and residential developments.

VIA work undertaken during the last twelve months includes wind energy projects, numerous solar plant projects (CSP and PV) and electrical infrastructure.

Select List of Visual Impact Assessment Projects

- **Geelkop Solar PV projects –** Landscape and Visual Impact Assessment for seven proposed solar PV projects near Upington in the Northern Cape Province for Atlantic Renewable Energy Partners.
- **Makapanstad Agri- Hub –** Landscape and Visual Impact Assessment for proposed Agri-Hub development at Makapanstad in the North West Province for the Department of Rural Development and Land Reform.
- **Madikwe Sky Bubble -** Landscape and Visual Impact Assessment for proposed development of up-market accommodation at the Molori concession within the Madikwe Game Reserve.
- **Hartebeest Wind Energy Facility** – Landscape and Visual Impact Assessment Addendum Report for the proposed upgrading of turbine specifications for an authorised WEF near Mo0rreesburg in the Western Cape Province for a private client.
- **Selati Railway Bridge** - Landscape and Visual Impact Assessment for proposed development of up-market accommodation on a railway bridge at Skukuza in the Kruger Park.
- **Kangala Mine Extension -** Landscape and Visual Impact Assessment for a proposed extension to the Kangala Mine in Mpumalanga for Universal Coal.
- **Khunab Solar Developments** – Landscape and Visual Impact Assessment for four proposed solar PV projects near Upington in the Northern Cape Province for a private client.
- **Sirius Solar Developments** – Landscape and Visual Impact Assessment for four proposed solar PV projects near Upington in the Northern Cape Province for Sola Future Energy.
- **Aggeneys Solar Developments** – Landscape and Visual Impact Assessment for two proposed solar PV projects near Aggeneys in the Northern Cape Province for a private client.
- **Hyperion Solar Developments** – Landscape and Visual Impact Assessment for four proposed solar PV projects near Kathu in the Northern Cape Province for Building Energy South Africa.
- **Eskom Combined Cycle Power Plant** - Landscape and Visual Impact Assessment for proposed gas power plant in Richards Bay, KwaZulu Natal Province.
- **N2 Wild Coast Toll Road, Mineral Sources and Auxiliary Roads –** VIA for the Pondoland Section of this project for the South African National Roads Agency.
- **Mpushini Park Ashburton –** VIA for a proposed amendment to an authorised development plan which included residential, office park and light industrial uses to logistics and warehousing.
- **Moedeng PV Solar Project -** VIA for a solar project near Vrybury in the North West Province for a private client.
- **Establishment of Upmarket Tourism Accommodation on the Selati Bridge, Kruger National Park** – Assessment of visual implications of providing tourism accommodation in 12 railway carriages on an existing railway bridge at the Skukuza Rest Camp in the Kruger Park.
- **Jozini TX Transmission Tower** – Assessment of visual implications of a proposed MTN transmission tower on the Lebombo ridgeline overlooking the Pongolapoort Nature reserve and dam.
- **Bhangazi Lake Development** – Visual Impact Assessment for a proposed tourism development within the iSimangaliso Wetlend Park World Heritage Site.
- **Palesa Power Station** - VIA for a new 600MW power station near Kwamhlanga in Mpumalanga for a private client.
- **Heuningklip PV Solar Project** – VIA for a solar project in the Western Cape Province for a private client.
- **Kruispad PV Solar Project** – VIA for a solar project in the Western Cape Province for a private client.
- **Doornfontein PV Solar Project** – VIA for a solar project in the Western Cape Province for a private client.
- **Olifantshoek Power Line and Substation** – VIA for a new 10MVA 132/11kV substation and 31km

powerline, Northern Cape Province, for Eskom.

- **Noupoort Concentrating Solar Plants -** Scoping and Visual Impact Assessments for two proposed parabolic trough projects.
- **Drakensberg Cable Car –** Preliminary Visual Impact Assessment and draft terms of reference as part of the feasibility study.
- **Paulputs Concentrating Solar Plant (tower technology)** – Visual Impact Assessment for a new CSP project near Pofadder in the Northern Cape.
- **Ilanga Concentrating Solar Plants 1, 2, 3, 4 & 5** – Scoping and Visual Impact Assessments for the proposed extension of five authorised CSP projects including parabolic trough and tower technology within the Karoshoek Solar Valley near Upington in the Northern Cape.
- **Ilanga Concentrating Solar Plants 1, 2, 3, 4 & 5 Shared Infrastructure** –Visual Impact Assessment for the necessary shared infrastructure including power lines, substation, water pipeline and roads for these projects.
- **Ilanga Concentrating Solar Plants 7, 8 & 9** - Scoping and Visual Impact Assessments for three new CSP projects including parabolic trough and tower technology within the Karoshoek Solar Valley near Upington in the Northern Cape.
- **Sol Invictus Solar Plants** - Scoping and Visual Impact Assessments for three new Solar PV projects near Pofadder in the Northern Cape.
- **Gunstfontein Wind Energy Facility** – Scoping and Visual Impact Assessment for a proposed WEF near Sutherland in the Northern Cape.
- **Moorreeesburg Wind Energy Facility** – Visual Impact Assessment for a proposed WEF near Moorreeesburg in the Western Cape.
- **Semonkong Wind Energy Facility** - Visual Impact Assessment for a proposed WEF near Semonkong in Southern Lesotho.
- **Great Karoo Wind Energy Facility** – Addendum report to the Visual Impact Assessment Report for amendment to this authorised WEF that is located near Sutherland in the Northern Cape. Proposed amendments included layout as well as rotor diameter.
- **Perdekraal East Power Line** – Visual Impact Assessment for a proposed power line to evacuate power from a wind energy facility near Sutherland in the Northern Cape.
- **Tshivhaso Power Station** – Scoping and Visual Impact Assessment for a proposed new power station near Lephalale in Limpopo Province.
- **Saldanha Eskom Strengthening** – Scoping and Visual Impact Assessment for the upgrading of strategic Eskom infrastructure near Saldanha in the Western Cape.
- **Eskom Lethabo PV Installation** - Scoping and Visual Impact Assessment for the development of a solar PV plant within Eskom's Lethabo Power Station in the Free State.
- **Eskom Tuthuka PV Installation** - Scoping and Visual Impact Assessment for the development of a solar PV plant within Eskom's Thutuka Power Station in Mpumalanga.
- **Eskom Majuba PV Installation** - Scoping and Visual Impact Assessment for the development of a solar PV plant within Eskom's Majuba Power Station in Mpumalanga.
- **Golden Valley Power Line** - Visual Impact Assessment for a proposed power line to evacuate power from a wind energy facility near Cookhouse in the Eastern Cape.
- **Mpophomeni Shopping Centre** – Visual impact assessment for a proposed new shopping centre close to the southern shore of Midmar Dam in KwaZulu Natal.
- **Rheeboksfontein Power Line** - Addendum report to the Visual Impact Assessment Report for amendment to this authorised power line alignment located near Darling in the Western Cape.
- **Woodhouse Solar Plants** – Scoping and Visual Impact Assessment for two proposed solar PV projects near Vryburg in the North West Province.

- **AngloGold Ashanti, Dokyiwa (Ghana)** – Visual Impact Assessment for proposed new Tailings Storage Facility at a mine site working with SGS as part of their EIA team.
- **Gateway Shopping Centre Extension (Durban)** – Visual Impact Assessment for a proposed shopping centre extension in Umhlanga, Durban.
- **Kouroussa Gold Mine (Guinea)** – Visual impact assessment for a proposed new mine in Guinea working with SGS as part of their EIA team.
- **Mampon Gold Mine (Ghana)** - Visual impact assessment for a proposed new mine in Ghana working with SGS as part of their EIA team.
- **Telkom Towers** – Visual impact assessments for numerous Telkom masts in KwaZulu Natal.
- **Eskom Isundu Substation** – Visual Impact Assessment for a proposed major new Eskom substation near Pietermaritzburg in KwaZulu Natal.
- **Eskom St Faiths Power Line and Substation** – Visual Impact Assessment for a major new substation and associated power lines near Port Shepstone in KwaZulu Natal.
- **Eskom Ficksburg Power Line** – Visual Impact Assessment for a proposed new power line between Ficksburg and Cocolan in the Free State.
- **Eskom Matubatuba to St Lucia Power Line** – Visual Impact Assessment for a proposed new power line between Mtubatuba and St Lucia in KwaZulu Natal.
- **Dube Trade Port, Durban International Airport** – Visual Impact Assessment
- **Sibaya Precinct Plan** – Visual Impact Assessment as part of Environmental Impact Assessment for a major new development area to the north of Durban.
- **Umdloti Housing** – Visual Impact Assessment as part of Environmental Impact Assessment for a residential development beside the Umdloti Lagoon to the north of Durban.
- **Tata Steel Ferrochrome Smelter** - Visual impact assessment of proposed new Ferrochrome Smelter in Richards Bay as part of EIA undertaken by the CSIR.
- **Durban Solid Waste Large Landfill Sites –** Visual Impact Assessment of proposed development sites to the North and South of the Durban Metropolitan Area. The project utilised 3d computer visualisation techniques.
- **Hillside Aluminium Smelter, Richards Bay -** Visual Impact Assessment of proposed extension of the existing smelter. The project utilised 3d computer visualisation techniques.
- **Estuaries of KwaZulu Natal Phase 1 –** Visual character assessment and GIS mapping as part of a review of the condition and development capacity of eight estuary landscapes for the Town and Regional Planning Commission. The project was extended to include all estuaries in KwaZulu Natal.
- **Signage Assessments** – Numerous impact assessments for proposed signage developments for Blast Media.
- **Signage Strategy** – Preparation of an environmental strategy report for a national advertising campaign on National Roads for Visual Image Placements.
- **Zeekoegatt, Durban** - Computer aided visual impact assessment. EDP acted as advisor to the Province of KwaZulu Natal in an appeal brought about by a developer to extend a light industrial development within a 60 metre building line from the National N3 Highway.
- **La Lucia Mall Extension** - Visual impact assessment using three dimensional computer modelling / photo realistic rendering and montage techniques for proposed extension to shopping mall for public consultation exercise.
- **Redhill Industrial Development** - Visual impact assessment using three dimensional computer modelling / photo realistic rendering and montage techniques for proposed new industrial area for public consultation exercise.
- **Avondale Reservoir** - Visual impact assessment using three dimensional computer modelling / photo realistic rendering and montage techniques for proposed hilltop reservoir as part of Environmental Impact Assessment for Umgeni Water.

- **Hammersdale Reservoir** - Visual impact assessment using three dimensional computer modelling / photo realistic rendering and montage techniques for proposed hilltop reservoir as part of Environmental Impact Assessment for Umgeni Water.
- **Southgate Industrial Park, Durban** - Computer Aided Visual Impact Assessment and Landscape Design for AECI.
- **Sainsbury's Bryn Rhos** - Computer Aided Visual Impact Assessment/ Planning Application for the development of a new store within the Green Wedge North of Swansea.
- **Ynyston Farm Access** - Computer Aided Impact Assessment of visual intrusion of access road to proposed development of Cardiff for the Land Authority for Wales.
- **Cardiff Bay Barrage** – Preparation of the Visual Impact Statement for inclusion in the Impact Statement for debate by parliament (UK) prior to the passing of the Cardiff Bay Barrage Bill.
- **A470, Cefn Coed to Pentrebach** - Preparation of landscape frameworks for the assessment of the impact of the proposed alignment on the landscape for The Welsh Office.
- **Sparkford to Illchester Bye Pass** - The preparation of the landscape framework and the draft landscape plan for the Department of Transport.
- **Green Island Reclamation Study** - Visual Impact Assessment of building massing, Urban Design Guidelines and Masterplanning for a New Town extension to Hong Kong Island.
- **Route 3** - Visual Impact Assessment for alternative road alignments between Hong Kong Island and the Chinese Border.
- **China Border Link** - Visual Impact Assessment and initial Landscape Design for a new border crossing at Lok Ma Chau.
- **Route 81, Aberdeen Tunnel to Stanley** - Visual Impact Assessment for alternative highway alignments on the South side of Hong Kong Island.

APPENDIX II

GUIDELINES FOR INVOLVING VISUAL AND AESTHETIC SPECIALISTS IN EIA PROCESSES

(Preface, Summary and Contents for full document go to the Provincial Government of the Western Cape, Department of Environmental Affairs and Development Planning web site, http://eadp.westerncape.gov.za/your-resource-library/policies-guidelines)

GUIDELINE FOR INVOLVING VISUAL AND AESTHETIC SPECIALISTS IN EIA PROCESSES

PROVINCIAL GOVERNMENT OF THE WESTERN CAPE:
DEPARTMENT OF ENVIRONMENTAL AFFAIRS
AND DEVELOPMENT PLANNING



bola

CSIR

Edition 1
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GUIDELINE FOR INVOLVING VISUAL AND AESTHETIC SPECIALISTS IN EIA PROCESSES

Edition 1

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Stakeholders engaged in the guideline development process:

These guidelines were developed through a consultative process and have benefited from the inputs and comments provided by a wide range of individuals and organizations actively working to improve EIA practice. Thanks are due to all who took the time to engage in the guideline development process.

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Magdel van der Merwe and Elna Logie, DTP Solutions

PREFACE

The purpose of an Environmental Impact Assessment (EIA) is to provide decision-makers (be they government authorities, the project proponent or financial institutions) with adequate and appropriate information about the potential positive and negative impacts of a proposed development and associated management actions in order to make an informed decision whether or not to approve, proceed with or finance the development.

For EIA processes to retain their role and usefulness in supporting decision-making, the involvement of specialists in EIA needs to be improved in order to:

- Add greater value to project planning and design;
- Adequately evaluate reasonable alternatives;
- Accurately predict and assess potential project benefits and negative impacts;
- Provide practical recommendations for avoiding or adequately managing negative impacts and enhancing benefits;
- Supply enough relevant information at the most appropriate stage of the EIA process to address adequately the key issues and concerns, and effectively inform decision-making in support of sustainable development.

It is important to note that not all EIA processes require specialist input; broadly speaking, specialist involvement is needed when the environment could be significantly affected by the proposed activity, where that environment is valued by or important to society, and/or where there is insufficient information to determine whether or not unavoidable impacts would be significant.

The purpose of this series of guidelines is to improve the efficiency, effectiveness and quality of specialist involvement in EIA processes. The guidelines aim to improve the capacity of roleplayers to anticipate, request, plan, review and discuss specialist involvement in EIA processes. Specifically, they aim to improve the capacity of EIA practitioners to draft appropriate terms of reference for specialist input and assist all roleplayers in evaluating whether or not specialist input to the EIA process is appropriate for the type of development and environmental context. Furthermore, they aim to ensure that specialist inputs support the development of effective, practical Environmental Management Plans where projects are authorised to proceed (refer to *Guideline for Environmental Management Plans*).

The guidelines draw on best practice in EIA in general, and within specialist fields of expertise in particular, to address the following issues related to the timing, scope and quality of specialist input. The terms "specialist involvement" and "input" have been used in preference to "specialist assessment" and "studies" to indicate that the scope of specialists' contribution (if required) depends on the nature of the project, the environmental context and the amount of available information and does not always entail detailed studies or assessment of impacts.

The guidelines draw on best practice in EIA in general, and within specialist fields of expertise in particular, to address the following issues related to the timing, scope and quality of specialist input. The terms "specialist involvement" and "input" have been used in preference to "specialist

assessment" and "studies" to indicate that the scope of specialists' contribution depends on the nature of the project, the environmental context and the amount of available information.

	ISSUES
TIMING	▪ When should specialists be involved in the EIA process; i.e. at what stage in the EIA process should specialists be involved (if at all) and what triggers the need for their input?
SCOPE	▪ Which aspects must be addressed through specialist involvement; i.e. what is the purpose and scope of specialist involvement? ▪ What are appropriate approaches that specialists can employ? ▪ What qualifications, skills and experience are required?
QUALITY	▪ What triggers the review of specialist studies by different roleplayers? ▪ What are the review criteria against which specialist inputs can be evaluated to ensure that they meet minimum requirements, are reasonable, objective and professionally sound?

The following guidelines form part of this first series of guidelines for involving specialists in EIA processes:

- Guideline for determining the scope of specialist involvement in EIA processes
- Guideline for the review of specialist input in EIA processes
- Guideline for involving biodiversity specialists in EIA processes
- Guideline for involving hydrogeologists in EIA processes
- Guideline for involving visual and aesthetic specialists in EIA processes
- Guideline for involving heritage specialists in EIA processes
- Guideline for involving economists in EIA processes

The *Guideline for determining the scope of specialist involvement in EIA processes* and the *Guideline for the review of specialist input in EIA processes* provide generic guidance applicable to any specialist input to the EIA process and clarify the roles and responsibilities of the different roleplayers involved in the scoping and review of specialist input. It is recommended that these two guidelines are read first to introduce the generic concepts underpinning the guidelines which are focused on specific specialist disciplines.

Who is the target audience for these guidelines?

The guidelines are directed at authorities, EIA practitioners, specialists, proponents, financial institutions and other interested and affected parties involved in EIA processes. Although the guidelines have been developed with specific reference to the Western Cape province of South Africa, their core elements are more widely applicable.

What type of environmental assessment processes and developments are these guidelines applicable to?

The guidelines have been developed to support project-level EIA processes regardless of whether they are used during the early project planning phase to inform planning and design decisions (i.e. during pre-application planning) or as part of a legally defined EIA process to obtain statutory approval for a proposed project (i.e. during screening, scoping and/or impact assessment). Where specialist input may be required the guidelines promote early, focused and appropriate involvement of specialists in EIA processes in order to encourage proactive consideration of potentially significant impacts, so that negative impacts may be avoided or

effectively managed and benefits enhanced through due consideration of alternatives and changes to the project.

The guidelines aim to be applicable to a range of types and scales of development, as well as different biophysical, social, economic and governance contexts.

What will these guidelines not do?

In order to retain their relevance in the context of changing legislation, the guidelines promote the principles of EIA best practice without being tied to specific legislated national or provincial EIA terms and requirements. They therefore do not clarify the specific administrative, procedural or reporting requirements and timeframes for applications to obtain statutory approval. They should, therefore, be read in conjunction with the applicable legislation, regulations and procedural guidelines to ensure that mandatory requirements are met.

It is widely recognized that no amount of theoretical information on how best to plan and coordinate specialist inputs, or to provide or review specialist input, can replace the value of practical experience of coordinating, being responsible for and/or reviewing specialist inputs. Only such experience can develop sound judgment on such issues as the level of detail needed or expected from specialists to inform decision-makers adequately. For this reason, the guidelines should not be viewed as prescriptive and inflexible documents. Their intention is to provide best practice guidance to improve the quality of specialist input.

Furthermore, the guidelines do not intend to create experts out of non-specialists. Although the guidelines outline broad approaches that are available to the specialist discipline (e.g. field survey, desktop review, consultation, modeling), specific methods (e.g. the type of model or sampling technique to be used) cannot be prescribed. The guidelines should therefore not be used indiscriminately without due consideration of the particular context and circumstances within which an EIA is undertaken, as this influences both the approach and the methods available and used by specialists.

How are these guidelines structured?

The specialist guidelines have been structured to make them user-friendly. They are divided into six parts, as follows:

- **Part A**: Background;
- **Part B**: Triggers and key issues potentially requiring specialist input;
- **Part C**: Planning and coordination of specialist inputs (drawing up terms of reference);
- **Part D**: Providing specialist input;
- **Part E**: Review of specialist input; and
- **Part F**: References.

Part A provides grounding in the specialist subject matter for all users. It is expected that authorities and peer reviewers will make most use of Parts B and E; EIA practitioners and project proponents Parts B, C and E; specialists Part C and D; and other stakeholders Parts B, D and E. Part F gives useful sources of information for those who wish to explore the specialist topic.

SUMMARY

This guideline document, which deals with specialist visual input into the EIA process, is organised into a sequence of interleading sections. These follow a logical order covering the following:

- the background and context for specialist visual input;
- the triggers and issues that determine the need for visual input;
- the type of skills and scope of visual inputs required in the EIA process;
- the methodology, along with information and steps required for visual input;
- finally, the review or evaluation of the visual assessment process.

Part A is concerned with defining the visual and aesthetic component of the environment, and with principles and concepts relating to the visual assessment process. The importance of the process being logical, holistic, transparent and consistent is stressed in order for the input to be useful and credible.

The legal and planning context within which visual assessments take place indicate that there are already a number of laws and bylaws that protect visual and scenic resources. These resources within the Western Cape context have importance for the economy of the region, along with the proclaimed World Heritage Sites in the Province.

The role and timing of specialist visual inputs into the EIA process are outlined, with the emphasis being on timely, and on appropriate level of input, from the early planning stage of a project, through to detailed mitigation measures and management controls at the implementation stage.

Part B deals with typical factors that trigger the need for specialist visual input to a particular project. These factors typically relate to:

(a) the nature of the receiving environment, in particular its visual sensitivity or protection status;
(b) the nature of the project, in particular the scale or intensity of the project, which would result in change to the landscape or townscape.

The correlation between these two aspects are shown in a table, in order to determine the varying levels of visual impact that can be expected, i.e. from little or no impact, to very high visual impact potential.

Part C deals with the choice of an appropriate visual specialist, and the preparation of the terms of reference (TOR) for the visual input. Three types of visual assessment are put forward, each requiring different expertise, namely:
Type A: assessments involving large areas of natural or rural landscape;
Type B: assessments involving local areas of mainly built environment;
Type C: assessments involving smaller scale sites with buildings, or groups of buildings.

The scope of the visual input would in summary relate to the following:

- the issues raised during the scoping process;
- the time and space boundaries, i.e. the extent or zone of visual influence;

- the types of development alternatives that are to be considered;
- the variables and scenarios that could affect the visual assessment;
- the inclusion of direct, indirect and cumulative effects.

Approaches to the visual input relate to the level of potential impact and range from minimal specialist input, to a full visual impact assessment (VIA). A list of the typical components of a visual assessment is given, and the integration with other studies forming part of the EIA process is discussed.

Part D provides guidance for specialist visual input, and on the information required by specialists. Notes on predicting potential visual impacts are given, along with suggested criteria for describing and rating visual impacts. The assessment of the overall significance of impacts, as well as thresholds of significance are discussed.

Further aspects that need to be considered by visual specialists in EIA processes include:

- affected parties who stand to benefit or lose,
- risks and uncertainties related to the project,
- assumptions that have been made, and their justification,
- levels of confidence in providing the visual input or assessment,
- management actions that can be employed to avoid or mitigate adverse effects and enhance benefits, and
- the best practicable environental option from the perspective of the visual issues and impacts.

Finally, pointers for the effective communication of the findings are given.

Part E lists specific evaluation criteria for reviewing visual input by a specialist, where this becomes necessary. Further guidance on this is given in the document on *Guideline for the review of specialist input in EIA processes*.

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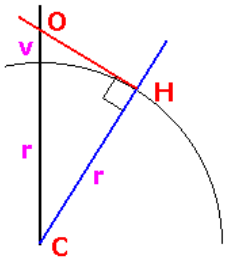
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APPENDIX III

FORMULA FOR DERIVING THE APPROXIMATE VISUAL HORIZON

The Mathematics behind this Calculation

This calculation should be taken as a guide only as it assumes the earth is a perfect ball 6378137 metres radius. It also assumes the horizon you are looking at is at sea level. A triangle is formed with the centre of the earth (C) as one point, the horizon point (H) is a right angle and the observer (O) the third corner. Using Pythagoras's theorem we can calculate the distance from the observer to the horizon (OH) knowing CH is the earth's radius (r) and CO is the earth's radius (r) plus observer's height (v) above sea level.



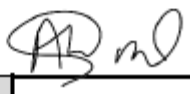
Sitting in a hotel room 10m above sea level a boat on the horizon will be 11.3km away. The reverse is also true, whilst rowing across the Atlantic, the very top of a mountain range 400m high could be seen on your horizon at a distance of 71.4 km assuming the air was clear enough.

APPENDIX IV

DETAILED ASSESSMENT METHODOLOGY

TITLE:	ENVIRONMENTAL IMPACT ASSESSMENT RATING PROCEDURE

EIMS | ENVIRONMENTAL IMPACT MANAGEMENT SERVICES

REV:	02	AUTHOR		APPROVED	
EFFECTIVE DATE:		NAME:	L. WHITLOW	NAME:	A. SMITH
		DATE:	29 January 2025	DATE:	29 January 2025
		SIGN:		SIGN:	
COPY / STATUS No:		MASTER COPY		DOCUMENT No:	PRO 106

1. Purpose

The purpose of this procedure is to guide the undertaking of an impact and risk assessment process, as required under the regulations promulgated under the National Environmental Management Act (Act 107 of 1998 - NEMA).

2. Scope

This procedure provides the methodology to be applied to environmental impacts and risks identified during the Environmental Impact Assessment Process. The methodology ensures that consistent impact assessment rating is carried out that is legally compliant and aligned with EIMS's objective of providing a quality service.

3. References

GNR. 982 National Environmental Management Act (Act No. 107 of 1998): Environmental Impact Assessment Regulations, 2014 – hereafter referred to as the Regulations.

4. Additional Guidelines and References

Guidelines and Reference Docs (not exhaustive – please verify with the applicable competent authority).	
Compulsory Compliance: GNR. 982 National Environmental Management Act (Act No. 107 of 1998 - NEMA): Environmental Impact Assessment Regulations, 2014.	National
Companion Guideline for Implementation: Environmental Management Assessment Regulations, 2010 - GN 805/2012 (NEMA)	National
DEAT (2002) Impact Significance, Integrated Environmental Management, Information Series 5, Department of Environmental Affairs and Tourism (DEAT), Pretoria	National

5. Definitions and Abbreviations

Refer to Chapter 1 of the Regulations.

6. Procedure

The impact significance rating methodology, as presented herein and utilised for all EIMS Impact Assessment Projects, is guided by the requirements of the NEMA EIA Regulations 2014 (as amended). The approach may be altered or substituted on a case by case basis if the specific aspect being assessed requires such- such instances require prior EIMS Project Manager approval. The broad approach to the significance rating methodology is to determine the significance (S) of an environmental risk or impact by considering the consequence (C) of each impact (comprising Nature, Extent, Duration, Magnitude, and Reversibility) and relating this to the probability/ likelihood (P) of the impact occurring. The S is determined for the pre- and post-mitigation scenario. In addition, other factors, including cumulative impacts and potential for irreplaceable loss of resources, are used to determine a prioritisation factor (PF) which is applied to the S to determine the overall final significance rating (FS). The impact assessment will be applied to all identified alternatives.

a. Determination of Significance

The final significance (FS) of an impact or risk is determined by applying a prioritisation factor (PF) to the post-mitigation environmental significance. The significance is dependent on the consequence (C) of the particular impact and the probability (P) of the impact occurring. Consequence is determined through the consideration of the Nature (N), Extent (E), Duration (D), Magnitude (M), and Reversibility (R) applicable to the specific impact.

For the purpose of this methodology the consequence of the impact is represented by:

$$C = \frac{(E + D + M + R) * N}{4}$$

Each individual aspect in the determination of the consequence is represented by a rating scale as defined in Table 1 below.

Table 1: Criteria for Determining Impact Consequence

Aspect	Score	Definition
Nature	- 1	Likely to result in a negative/ detrimental impact
	+1	Likely to result in a positive/ beneficial impact
Extent	1	Activity (i.e. Highly localised, limited to the area applicable to the specific activity)
	2	Site (i.e. within the development property or site boundary, or the area within a few hundred meters of the site)
	3	Local (i.e. beyond the site boundary within the Local administrative boundary (e.g. Local Municipality) or within consistent local geographical features, or the area within 5 km of the site)
	4	Regional (i.e. Far beyond the site boundary, beyond the Local administrative boundaries within the Regional administrative boundaries (e.g. District Municipality), or extends into different distinct geographical features, or extends between 5 and 50 km from the site).
	5	Provincial / National / International (i.e. extends into numerous distinct geographical features, or extends beyond 50 km from the site).
Duration	1	Immediate (<1 year, quickly reversible)
	2	Short term (1-5 years, less than project lifespan)
	3	Medium term (6-15 years)
	4	Long term (15-65 years, the impact will cease after the operational life span of the project)
	5	Permanent (>65 years, no mitigation measure of natural process will reduce the impact after construction/ operation/ decommissioning).
Magnitude/ Intensity	1	Minor (where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected)
	2	Low (where the impact affects the environment in such a way that natural, cultural and social functions and processes are slightly affected, or affected environmental components are already degraded)
	3	Moderate (where the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; moderate improvement for +ve impacts; or where change affects area of potential conservation or other value, or use of resources).
	4	High (where natural, cultural or social functions or processes are altered to the extent that it will temporarily cease; high improvement for +ve impacts; or where change affects high conservation value areas or species of conservation concern)
	5	Very high / don't know (where natural, cultural or social functions or processes are altered to the extent that it will permanently cease, substantial improvement for +ve impacts; or disturbance to pristine areas of critical conservation value or critically endangered species)
Reversibility	1	Impact is reversible without any time and cost.

	2	Impact is reversible without incurring significant time and cost.
	3	Impact is reversible only by incurring significant time and cost.
	4	Impact is reversible only by incurring very high time and cost.
	5	Irreversible Impact.

Once the C has been determined, the significance is determined in accordance with the standard risk assessment relationship by multiplying the C and the P. Probability is rated/ scored as per Table 2.

It is noted that both environmental risks as well as environmental impacts should be identified and assessed. Environmental Risk can be regarded as the potential for something harmful to happen to the environment, and in many instances is not regarded as something that is expected to occur during normal operations or events (e.g. unplanned fuel or oil spills at a construction site). Probability and likelihood are key determinants or variables of environmental risk. Environmental Impact can be regarded as the actual effect or change that happens to the environment because of an activity and is typically an effect that is expected from normal operations or events (e.g. vegetation clearance from site development results in loss of species of concern). Typically the probability of an unmitigated environmental impact is regarded as highly likely or certain (management and mitigation measures would ideally aim to reduce this likelihood where possible). In summary, environmental risk is about what could happen, while environmental impact is about what does happen.

Table 2: Probability/ Likelihood Scoring

Probability	1	Improbable (Rare, the event may occur only in exceptional circumstances, the possibility of the impact materialising is very low as a result of design, historic experience, or implementation of adequate corrective actions; <5% chance).
	2	Low probability (Unlikely, impact could occur but not realistically expected; >5% and <20% chance).
	3	Medium probability (Possible, the impact may occur; >20% and <50% chance).
	4	High probability (Likely, it is most probable that the impact will occur- > 50 and <90% chance).
	5	Definite (Almost certain, the impact is expected to, or will, occur, >90% chance).

The result is a qualitative representation of relative significance associated with the impact. Significance is therefore calculated as follows:

$$S = C \times P$$

Table 3: Determination of Significance

Consequence	5- Very High[1]	5	10	15	20	25
	4- High	4	8	12	16	20
	3- Medium	3	6	9	12	15
	2- Low	2	4	6	8	10
	1- Very low	1	2	3	4	5

[1] In the event that an impact or risk has very high or catastrophic consequences, but the likelihood/ probability is low, then the resultant significance would be Low-medium. This does in certain instances detract from the relative important of this impact or risk and must consequently be flagged for further specific consideration, management, mitigation, or contingency planning.

		1- Improbable	2- Low	3- Medium/ Possible	4- High/ Probable	5- Highly likely/ Definite
	Probability					

The outcome of the significance assessment will result in a range of scores, ranging from 1 through to 25. These significance scores are then grouped into respective classes as described in Table 4.

Table 4: Significance Scores

S Score	Description
≤4.25	Low (i.e. where this impact is unlikely to be a significant environmental risk/ reward).
>4,25, ≤8.5	Low-Medium (i.e. where the impact could have a significant environmental risk/ reward).
>8.5, ≤13.75	High-Medium (i.e. where the impact could have a significant environmental risk/ reward).
>13.75	High (i.e. where the impact will have a significant environmental risk/ reward).

The impact significance will be determined for each impact without relevant management and mitigation measures (pre-mitigation significance), as well as post implementation of relevant management and mitigation measures (post-mitigation significance). This allows for a prediction in the degree to which the impact can be managed/mitigated.

b. Impact Prioritization

Further to the assessment criteria presented in the section above, it is necessary to consider each potentially significant impact in terms of:

1. Cumulative impacts; and
2. The degree to which the impact may cause irreplaceable loss of resources.

To ensure that these factors are considered, an impact prioritisation factor (PF) will be applied to each impacts' post-mitigation significance (post-mitigation). This prioritisation factor does not aim to detract from the significance ratings but rather to focus the attention of the decision-making authority on the higher priority/significance issues and impacts. The PF will be applied to the post-mitigation significance based on the assumption that relevant suggested management/mitigation impacts are implemented.

Table 5: Criteria for Determining Prioritisation

Cumulative Impact (CI)	Low (1)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.
	Medium (2)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is probable that the impact will result in spatial and temporal cumulative change.
	High (3)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is highly probable/ definite that the impact will result in spatial and temporal cumulative change.
	Low (1)	Where the impact is unlikely to result in irreplaceable loss of resources.

Irreplaceable Loss of Resources (LR)	Medium (2)	Where the impact may result in the irreplaceable loss (cannot be replaced or substituted) of resources but the value (services and/or functions) of these resources is limited.
	High (3)	Where the impact may result in the irreplaceable loss of resources of high value (services and/or functions).

The value for the final impact priority is represented as a single consolidated priority, determined as the sum of each individual criteria represented in Table 5. The impact priority is therefore determined as follows:

$$Priority = CI + LR$$

The result is a priority score which ranges from 2 to 6 and a consequent PF ranging from 1 to 1.5 (Refer to Table 6).

Table 6: Determination of Prioritisation Factor

Priority	Prioritisation Factor
2	1
3	1.125
4	1.25
5	1.375
6	1.5

In order to determine the final impact significance (FS), the PF is multiplied by the post-mitigation significance scoring. The ultimate aim of the PF is an attempt to increase the post mitigation environmental risk rating by a factor of 0.5, if all the priority attributes are high (i.e. if an impact comes out with a high medium environmental risk after the conventional impact rating, but there is significant cumulative impact potential and significant potential for irreplaceable loss of resources, then the net result would be to upscale the impact to a higher significance).

Table 7: Final Environmental Significance Rating

Significance Rating	Description
<-25	**Very High (Impacts in this class are extremely significant and pose a very high environmental risk. In certain instances these may represent a fatal flaw. They are likely to have a major influence on the decision and may be difficult or impossible to mitigate. Offset's may be necessary.**
<-13.75 to -25	High negative (These impacts are significant and must be carefully considered in the decision-making process. They have a high environmental risk or impact and require extensive mitigation measures).
-8.5 to -13.75	Medium-High negative (i.e. Impacts in this class are more substantial and could have a significant environmental risk. They may influence the decision to develop in the area and require more robust mitigation measures).
<-4.25 to <-8.5	Medium- Low negative (i.e. These impacts are slightly more significant than low impacts but still do not pose a major environmental risk. They might require some mitigation measures but are generally manageable).

Significance Rating	Description
-1 to -4.25	Low negative (i.e. Impacts in this class are minor and unlikely to have a significant environmental risk. They do not influence the decision to develop in the area and are typically easily mitigated.
0	No impact
1 to 4.25	Low positive
>4.25 to <8.5	Medium-Low positive
8.5 to 13.75	Medium-High positive
>13.75	High positive

The significance ratings and additional considerations applied to each impact will be used to provide a quantitative comparative assessment of the alternatives being considered. In addition, professional expertise and opinion of the specialists and the environmental consultants will be applied to provide a qualitative comparison of the alternatives under consideration. This process will identify the best alternative for the proposed project.

7. Responsibilities

It is the responsibility of each EIMS employee, and each external Specialist appointed by EIMS to ensure that this procedure is carried out as described. All the personnel within the organization have the responsibility to report any deviations/changes from the procedures to management. This is to ensure that the necessary changes are documented after approval.

It is the responsibility of the consultant (as applicable) assigned with the task of report compilation to ensure that this methodology/ procedure is strictly applied. It is the responsibility of the assigned Consultant or Quality Reviewer to review and verify that the procedure has been complied with, and such documented at the specified quality check intervals.

8. Records

RECORD	STORAGE LOCATION	STORAGE SYSTEM	RESPONSIBLE PERSON	RETENTION PERIOD
Significance Rating Input Spreadsheet	Project File - /Server/assignments/ Job#/Records	Electronic- Scanned PDF	Project Manager	10 Years

9. Record of Changes, Revisions and Cancellations

RECORD OF CHANGES, REVISIONS AND CANCELLATIONS		
DATE	NATURE / DETAIL OF CHANGE	REV No.
3/12/2024	Update impact criteria descriptions.	01
29/01/2025	Corrections to Significance class numbering	02