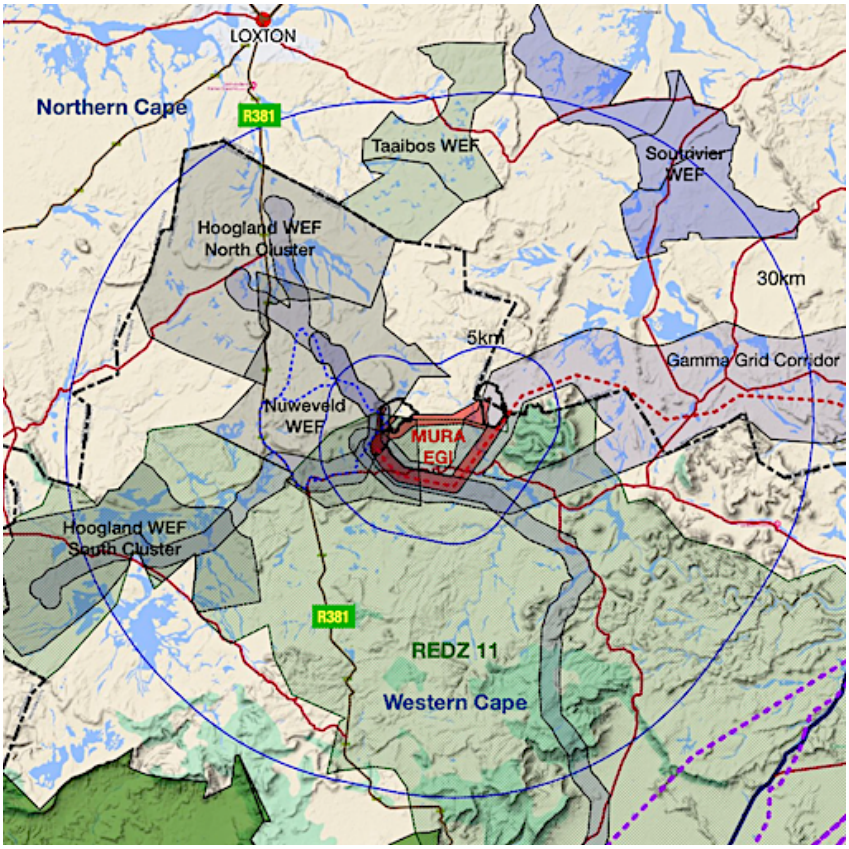
Proposed Mura Electrical Grid Infrastructure
Western Cape and Northern Cape Provinces

for Red Cap Energy (Pty) Ltd

Draft Visual Impact Assessment

05 December 2022



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This report has been compiled in accordance with the EIA Regulations, 2014 (Government Notice (GN) R982). Where a specialist assessment is required and no specific environmental theme protocol has been prescribed (as per Government Gazette 43110, 20 March 2020), the required level of assessment must be based on the findings of the site sensitivity verification and must comply with Appendix 6 of the EIA Regulations.

NEMA requirements for Specialist Reports		
	Specialist Report content as required by the NEMA 2014 EIA Regulations, as amended	**Section**
1 (1)(a)	(i) the specialist who prepared the report; and	Appendix A
	(ii) the expertise of that specialist to compile a specialist report including a curriculum vitae;	
(b)	a declaration that the specialist is independent in a form as may be specified by the competent authority;	Appendix C
(c)	an indication of the scope of, and the purpose for which, the report was prepared;	Sections 1 and 2
(cA)	an indication of the quality and age of the base data used for the specialist report;	Section 3
(cB)	a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Sections 9 and 12
(d)	the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Section 3
(e)	a description of the methodology adopted in preparing the report or carrying out the specialised process, inclusive of equipment and modelling used;	Section 3
(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 alternative;	Sections 9, 10, 11 and maps
(g)	an identification of any areas to be avoided, including buffers;	Section 9
(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 6-8
(i)	a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 4
(j)	a description of the findings and potential implications of such findings on the impact of the proposed activity, or activities;	Section 14
(k)	any mitigation measures for inclusion in the EMPr;	Section 13
(l)	any conditions for inclusion in the environmental authorisation;	Sections 14
(m)	any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Section 13
(n)	a reasoned opinion-	Section 14
	(i) whether the proposed activity or portions thereof should be authorised; and	
	(iA) regarding the acceptability of the proposed activity or activities; and	
	(ii) if the opinion is that the proposed activity 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;	
(o)	a description of any consultation process that was undertaken during the course of preparing the specialist report;	Refer to EAP
(p)	a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Refer to EAP
(q)	any other information requested by the competent authority.	N/A
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.	Section 8

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Abbreviations and Glossary

List of Abbreviations

BA	Basic Assessment
BESS	Battery Energy Storage System
DFFE	Department of Forestry, Fisheries and Environment
EAP	Environmental Assessment Practitioner
EGI	Electrical grid infrastructure
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
GN	Government Notice
MTS	Main transmission station
NEMA	National Environmental Management Act
O&M	Operations and maintenance
OHPL	Overhead powerline
REDZ	Renewable Energy Development Zone
REEA	Renewable Energy EIA Application Database
VIA	Visual Impact Assessment
WEF	Wind energy facility

Glossary

Definitions	
Receptor	Individuals, groups or communities who are subject to the visual influence of a particular project.
Viewpoint	A selected point in the landscape from which views of the project are ascertained.
Viewshed	The outer boundary defining a view catchment area, used to determine the zone of visual influence.
View shadow	An area within the view catchment visually obscured from the project, usually by topography.
Visual absorption capacity	The ability of an area to visually absorb development by means of screening topography, vegetation or buildings.

1 Introduction

Red Cap Energy (Pty) Ltd is proposing to develop four solar facilities and associated grid connections, on behalf of four separate Project Applicants, collectively known as the Mura PV projects between Loxton and Beaufort West (see **Map 1**). The proposed Mura PV projects are located in close proximity to the approved Nuweveld Wind Farm Development.

For the grid connection, an Electrical Grid Infrastructure (EGI) Corridor is proposed and is assessed in this Visual Impact Assessment (VIA) Report as part of a separate Basic Assessment Process. Earlier desktop visual screening and fieldwork were undertaken as part of the visual assessment.

The grid corridor includes up to two 132 kV overhead lines running in parallel, plus switching stations, to enable the connection of Mura Solar Developments to the approved Nuweveld Collector Substation. The Corridor involves a "collector ring line" to improve grid stability.

2 Terms of Reference

The terms of reference for the visual specialist study included the following:

- Visual sensitivity mapping
- Sensitivity Verification Reporting
- Defining the legal, planning and policy context
- Description of the Baseline Environment
- Determination of potential impacts (direct, indirect, cumulative)
- Formulation of mitigation measures to minimise visual impacts
- Input into the Management Plan / Monitoring Programme
- Incorporation of public comment following public participation.

3 Methodology

A visual assessment methodology included the following steps:

- A 3D digital terrain model of the study area is used to determine the viewshed of the project.
- Potential sensitive receptors, such as farmsteads, are identified.
- Landscape features and sensitive receptors are mapped together with recommended buffers.
- Field work is used to verify the existence and significance of landscape features and receptors in order to refine the visual mapping layers.
- A photographic record is made with the emphasis on views from potential sensitive receptors at varying distances.
- The panoramic photographs, which included their GPS positions, are used to create the photomontages.
- Potential visual impacts for the construction, operational and decommissioning phases of the project are assessed along with their relative significance.
- Mitigation measures to avoid or minimise potential negative visual impacts are formulated.
- Cumulative visual impacts in relation to other existing and proposed renewable energy facilities and associated grid connections in the area are assessed.
- Impact significance ratings are determined based on the methodology provided by the EAP.

Field Work:

A site visit was carried out from 18 to 20 July 2022. The track used during the fieldwork is indicated on **Map 4**. The season was not a consideration for the visual assessment, but clear visibility was required for the photographic survey.

4 Assumptions and Limitations

The visual assessment is based on the proposed locations of the switching stations and alignment options for the powerline made available by Red Cap.

5 Legal Requirements and Guidelines

Legal and policy documents relating to visual and scenic resources are described below. These tend to fall under the National Heritage legislation, the natural heritage being part of the 'national estate', and therefore the VIA Report needs to be read in conjunction with the HIA.

National Heritage Resources Act (Act 25 of 1999 NHRA)	The Act includes protection of national and provincial heritage sites, as well as areas of environmental or cultural value, and proclaimed scenic routes. Natural heritage, including scenic resources, form part of the 'national estate'.
Provincial Government of the Western Cape 2005: Guideline for Involving Visual and Aesthetic Specialists in EIA Processes	A guideline document for specialist visual input with respect to determining potential visual impacts, along with criteria for rating the significance of impacts.

6 Project Description

Table 1 below lists the footprint and height of the electrical grid infrastructure (EGI):

Table 1: Electrical Grid Components

Project Components	**Description**	**Total Footprint**	**Height**
Switching stations	2 Eskom switching stations per solar farm of approx. 150 x 75m (11,250m^2). Includes standard switching station electrical equipment, workshop, and storage buildings/areas. 4 additional switching stations within the corridor, outside the solar farm footprint.	13 ha	Max. 12m
Overhead lines and pylons	~70 km of overhead 132 kV lines. (~40 km single overhead 132 kV lines and ~30 km up to 2 overhead 132 kV lines running in parallel between the switching stations). Monopole pylons with average spans of 260m between pylons will be used where possible.	2,5 ha	Pylons max. 38m
Access roads and tracks	Existing access roads and tracks (upgraded to ± 2-4 m wide where needed) used as far as possible, and new access tracks created where needed (±2-4 m wide). Required for all project phases.	32 ha	n/a
Temporary areas	Temporary laydown areas along the alignment, with main equipment and construction yards located along the alignment or based in one of the surrounding towns, or at the solar site camp. Total area for the temporary laydown up to 2x 5 ha anticipated.	10 ha	n/a
Total temporary disturbance footprint		10 ha	
Total permanent disturbance footprint		48 ha	

Fig. 1: Typical monopole design

7 Description of the Study Area

A brief description of the landscape and scenic features of the study area are given below.

Landscape setting

The landscape and scenic features of the study area are similar to those for the Nuweveld wind farms. The EGI would lie within an expansive semi-arid landscape, with widely scattered farmsteads usually nestled among tree copses. The large farms mainly support merino sheep, and occasionally dorper sheep, goats and horses, as well as game, such as small antelope.

Geology and landforms

The landscape in this part of the Great Karoo has been eroded over time, the once deeply buried Beaufort Group mudstones and sandstones and the dolerite intrusions having been exposed to form the present-day Karoo landscape (**Map 3**).

The regional plateau is characterised by horizontal sills and dykes of erosion-resistant dolerite forming steep slopes in places, boulder-strewn *mesas* and flat-topped *koppies,* that are the main scenic features of the study area. The gentler, lower hillslopes and plains consist of more easily weathered mudstone, with occasional narrow ledges of harder sandstone. The flattish plains are at around 1400-1500m elevation, and the surrounding dolerite ridges and mesas around 1600-1700m elevation (**Map 2**).

Vegetation cover

The vegetation of the Upper Karoo Bioregion is a response to the geology and relatively low rainfall, which occurs mainly in summer. The *Eastern Upper Karoo (NKu4)* vegetation type on the Beaufort Group mudstones and sandstones covers most of the study area, and consists largely of dwarf shrubland, along with grasses and succulent shrubs in places.

The *Upper Karoo Hardeveld (NKu2)* vegetation type covers smaller areas, occurring on the dolerite crests and steep slopes, often among large boulders. It consists of a grassy dwarf Karoo shrubland (Mucina and Rutherford, 2006).

Land use

There are a few scattered farmsteads in the surroundings, within the viewshed, which form green oases in the semi-arid landscape. The farmsteads are on average 5 to 10km+ apart, linked by narrow gravel roads. The farms are generally extensive in area and support mainly sheep farming and game.

Sense of place

The flat-topped hills and dolerite ridges are a characteristic feature of the Great Karoo in an otherwise fairly featureless, parched landscape, an area noted mainly for its empty, uncluttered landscapes, stillness, red sunsets, dark nights and starry skies.

The most scenic areas tend to be the dolerite koppies and the river courses, particularly in the vicinity of Leeukloof and Booiskraal (see Figures 2 to 5 below).

Fig. 2: Typical mesas and plains with succulent shrub vegetation of the study area

Fig. 3: Scenic poort near Leeukloof

Fig. 4: Scenic poort east of Leeukloof near to where the grid crosses the Krom River

Fig. 5: Scenic kloof between Leeukloof and Booiskraal

8 Site Sensitivity Verification

Where a specialist assessment is required and no specific environmental theme protocol has been prescribed (as per Government Gazette 43110, 20 March 2020), the required level of assessment must be based on the findings of the site sensitivity verification and must comply with Appendix 6 of the EIA Regulations.

In accordance with GN 320 and GN 1150 of the NEMA EIA Regulations of 2014, prior to commencing with a specialist assessment, a site sensitivity verification must be undertaken to confirm the current land use and environmental sensitivity of the proposed project area as identified by the National Web-Based Environmental Screening Tool (Screening Tool).

The downloaded screening tool report for the Mura EGI corridor (DFFE, September 2022), does not include a visual specialist impact assessment as a requirement as part of the BA process, but the assessment is being undertaken as an additional study. A visual sensitivity map has been compiled and is included as **Maps 7 and 8**.

Landscape features and sensitive receptors were mapped using 1:50 000 topographical survey maps and Google Earth satellite imagery. Recommended buffers were added to features and receptors.

9 Visual Sensitivity Mapping

Visibility

Estimated degrees of visibility, based on the scale of the EGI pylons, from various receptors, are indicated in Figure 6 and in Tables 2 and 3 below:

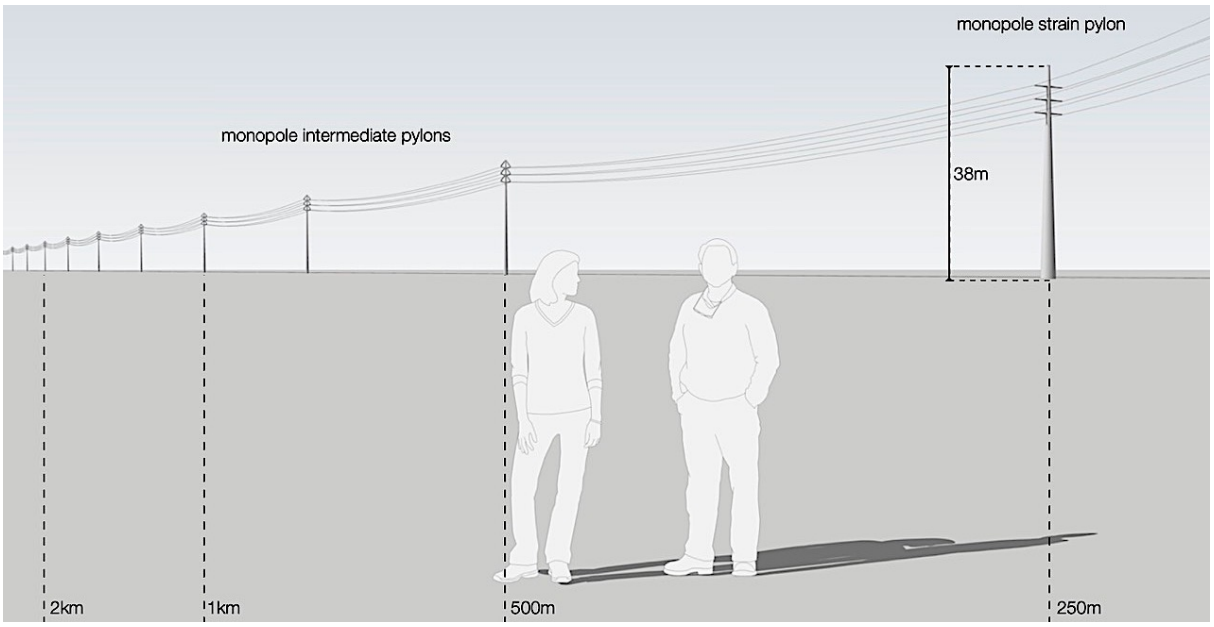

Fig. 6: Relative visibility of 132kV pylons at a range of distances

Table 2: Degrees of Visibility of Proposed EGI and Switching Stations

Very high visibility	0-500m	Prominent feature within the observer's view frame
High visibility	500m-1km	Relatively prominent within observer's view frame
Moderate visibility	1-2km	Only prominent as part of the wider landscape
Low visibility	2-4km	Visible as a minor element in the landscape
Very low visibility	>4km	Hardly visible with the naked eye in the distance

Table 3: Viewing Distances and Potential Visibility from Receptors

View-point		latitude	longitude	distance to corridor	visibility
M1	District road near Booiskraal	31.869404 S	22.605483 E	1.85 km	Moderate visibility
M2	near Booiskraal	31.865353 S	22.600844 E	1.23 km	Moderate visibility
M3	Scenic area of District Road	31.72103 S	22.538570 E	510 m	High visibility
M4	Southern end of PV1 and PV2	31.837717 S	22.481653 E	0 m	Very high visibility
M5	Bultontein	31.804099 S	2.528376 E	2.31 km	Low visibility
M5a	Farm road near Bultfontein	31.802193 S	22.531826 E	2.49 km	Low visibility
M6	Scenic area of farm road near PV4	31.812172 S	22.573683 E	290 m	Very high visibility

Visual Exposure:

The viewshed, or zone of visual influence, potentially extends for some 5km, but is partly restricted by topography to the north-west and the east, where parts of the surrounding area would be in a view shadow (see **Map 5**). The viewsheds of the proposed EGI tends to be fairly localised.

Visual Absorption Capacity (VAC)

This relates to the potential of the landscape to screen the proposed EGI from view. The largely treeless landscape provides little screening effect. In most cases, clumps of trees around farmsteads tend to reduce visibility by receptors.

Landscape Integrity

Landscape integrity tends to be enhanced by scenic or rural quality and intactness of the landscape, as well as absence of other visual intrusions. Cultural landscapes, such as rural or farming scenes also have visual or scenic value. On the other hand, industrial activity and visual 'clutter', including substations and powerlines, detract from these scenes. The sites for the proposed EGI generally has an uncluttered, expansive landscape with pastoral scenes.

Visually Sensitive Resources

Natural and cultural landscapes, or scenic resources, form part of the 'National Estate' and may have local, regional or even national significance, usually, but not only, of tourism importance. **Map 6** indicates landscape features of interest.

Visual Impact Intensity

The overall potential visual impact intensity (or magnitude) is determined in Table 4 below by combining all the factors above, namely visual exposure, visibility, visual absorption capacity, landscape integrity and visually sensitive resources.

Table 4: Visual Impact Intensity

Visual Criteria	Comments	EGI powerline	Switching stations
Visual exposure	Limited viewshed of the EGI	Medium-low	Low
Visibility	Visible in the distance from a few farmsteads.	Low	Low
Visual absorption capacity (VAC)	Visually exposed plains, and therefore low VAC.	Medium	Low
Landscape integrity / intactness	Effect on rural / pastoral farming character.	Medium	Medium
Landscape / scenic sensitivity	Effect on scenic resources, mainly rivers.	Medium	Low
Impact intensity	Summary	**Medium**	**Low-medium**

6. Visual Sensitivity Mapping

Landscape features of visual or scenic value, along with potential sensitive receptors in the surroundings, are described in Table 5 below. Visual features are indicated on **Map 6**.

Table 5: Typical Scenic Features and Sensitive Receptors

Landscape features within study area	
Topographic features	Characteristic landforms include the *mesas* and *koppies* formed from horizontal dolerite sills and vertical dolerite dykes. These features contribute to the scenic value, providing visual interest or contrast in the open Karoo landscape.
Water Features	In the dry landscape, drainage features, such as the Krom River, and the larger dams provide scenic and amenity value.
Cultural landscapes	Green patches of cultivated land and tree copses in alluvial valleys form part of the cultural landscape. Archaeological sites also form part of the cultural landscape, covered in the Heritage Assessment.
Receptors within the study area	
Protected Areas	Visual significance is increased by the protection status of reserves. There are no known proclaimed nature reserves, private reserves, or game farms in the vicinity of the proposed EGI.

Guest farms	Private guest farms and guest accommodation in the area are important for the local tourism economy and tend to be sensitive to loss or degradation of scenic quality. Booiskraal is the closest at about 1km from the EGI corridor.
Human settlements, farmsteads	Except for the nearby farmsteads, there are no other settlements within the study area.
Scenic and arterial routes	Much of the route between Leeukloof and Booiskraal has scenic features.

Scenic resources and sensitive receptors within the study area have been categorised into no-go, high sensitivity, medium and low visual sensitivity zones, in relation to the EGI, as indicated in Table 6 below.

The visual sensitivity categories in relation to the mapping are outlined in Tables 7 and 8 below and indicated on **Map 7** (pylons) and **Map 8** (overhead powerline).

Table 6: Sensitivity Categories

No Go	Areas or features considered of such sensitivity or importance that any adverse effects upon them may be regarded as a fatal flaw.
High	Development to be limited and remain within acceptable limits of change determined by the specialist, and comply with restrictions or mitigation measures identified by the specialist.
Medium	Areas considered to be developable, but to remain within acceptable limits of change as determined by the specialist, and comply with restrictions or mitigation measures identified by the specialist.
Low	Low sensitivity areas that are considered to be developable. However specialists may still wish to define acceptable limits of change where necessary.

Table 7: Visual Sensitivity Buffers for 132kV Grid: Pylon Placement and Switching Stations

Scenic Resources	**Very high sensitivity (No-go)**	**High visual sensitivity**	**Medium visual sensitivity**	**Low visual sensitivity**
Topographic features (peaks)	within 100m	within 150m	within 250m	-
Linear topo features (ridges)	-	within 150m	within 250m	
Steep slopes	Slopes > 1:4	Slopes > 1:6	Slopes> 1:10	-
Scenic water features	within 50m	Within 100m	within 150m	-
Protected Landscapes / Sensitive Receptors				
Private reserves /guest farms	-	-	-	-
Farmsteads	-	-	-	-
Scenic routes, poorts, passes	within 100m	within 150m	within 250m	-
Main district roads	within 50m	within 75m	within 100m	-

Table 8: Visual Sensitivity Buffers for 132kV grid: Overhead Powerlines and Access Roads

Scenic Resources	Very high sensitivity (No-go)	High visual sensitivity	Medium visual sensitivity	Low visual sensitivity
Topographic features (peaks)	within 100m	within 150m	within 250m	-
Linear topo features (ridges)	-	within 150m	within 250m	
Steep slopes		slopes > 1:2		
Scenic/linear water features	-	Within 100m	within 150m	-
Protected Landscapes / Sensitive Receptors				
Private reserves /guest farms	-	-	-	-
Farmsteads	-	-	-	-
Scenic routes, poorts, passes	-	within 150m	within 250m	-
Main district roads	-	within 75m	within 100m	-

10 Visual Impact Assessment

The quantification of overall visual impact significance for the proposed solar projects is based on the methodology provided by WSP (2022), as used in Tables 9 to 11. The assessment criteria are included in Appendix B of this report.

The potential visual impacts for the proposed EGI Gridline and switching stations would be similar, and therefore only one set of tables is provided.

Table 9: Visual Impact Assessment – Construction Phase of EGI Gridline and Switching Stations

Nature of the impact: Visual effect of construction activities on scenic resources and sensitive receptors					
Description of Impact: Visual intrusion of cranes, heavy vehicles and construction activities for the erection of pylons and switching stations. Visual intrusion on access / haul roads. Noise and dust from construction activity affecting sense of place.					
	M+	**E+**	**R+**	**Dx**	**P=**
Without Mitigation Score	Medium 3	Local 2	Recoverable 3	Short term 2	Highly probable 4
With Mitigation Score	Medium 3	Local 2	Recoverable 3	Short term 2	Probable 3
Significance Calculation	**Without Mitigation**		**With Mitigation**		
(M+E+R+D) x P	N3 Moderate Impact (40)		N2 Low Impact (30)		
Mitigation measures: Pylons and switching stations to be located in low-lying visually unobtrusive positions, outside no-go areas where possible. Existing roads and tracks to be used where possible and kept as narrow as practical. Disturbed areas to be rehabilitated / revegetated as soon as possible during or after the construction phase. Construction camps to be located away from main district roads. Stockpiles to be located within approved construction footprints. Dust and noise control measures to conform with the EMPr.					
Residual impact	Visual disturbance caused by construction vehicles.				

Table 10: Visual Impact Assessment – Operational Phase of EGI Gridline and Switching Stations

Nature of the impact: Visual intrusion on scenic resources and sensitive receptors					
Description of Impact: Potential visual intrusion of pylons and switching stations on the open rural landscape and sensitive receptors. Change in the pastoral character and sense of place of the local area.					
	M+	**E+**	**R+**	**Dx**	**P=**
Without Mitigation Score	Medium 3	Local 2	Recoverable 3	Permanent 5	Highly probable 4
With Mitigation Score	Medium 3	Local 2	Recoverable 3	Permanent 5	Probable 3
Significance Calculation	**Without Mitigation**		**With Mitigation**		
(M+E+R+D) x P	N3 Moderate Impact (52)		N3 Moderate Impact (39)		
Mitigation measures: Consideration given to screening switching stations with vegetation. Signage and lighting to be kept to a minimum.					
Residual impact	Visual intrusion of pylons and switching stations on the exposed landscape.				

Table 11: Visual Impact Assessment – Decommissioning Phase of EGI Grid and Switching Stations

Nature of the impact: Visual intrusion of activities to remove infrastructure.					
Description of Impact: Visual effect of construction activities to remove infrastructure at the end of the life of the infrastructure, including pylons and switching stations. (The infrastructure would however be very long term).					
	M+	**E+**	**R+**	**Dx**	**P=**
Without Mitigation Score	Medium 3	Site 1	Recoverable 3	Short term 2	Highly probable 4
With Mitigation Score	Medium 3	Site 1	Recoverable 3	Short term 2	Probable 3
Significance Calculation	**Without Mitigation**		**With Mitigation**		
(M+E+R+D) x P	N3 Moderate Impact (36)		N2 Low Impact (27)		
Mitigation measures: Structures to be removed and re-used or recycled at the end of its life. Disturbed areas, including maintenance roads no longer required, to be rehabilitated / revegetated as soon as possible after the decommissioning phase.					
Residual impact	Visual intrusion of remaining roads and slabs on the local landscape.				

11 Alternatives

For the assessment phase of the project, four solar PV sites are being taken forward into the formal Assessment Phase of the development, along with the related EGI corridors.

The preferred EGI corridors are assessed against the 'No-go' alternative of not constructing the projects, in which case the status quo of the current farming activities on the site would prevail, and the significance of the no-go alternative would therefore be neutral.

12 Assessment of Cumulative Visual Impacts

Map 1 indicates other similar renewable energy projects, either existing or proposed, in order to assess cumulative visual impacts within a 30km radius of the proposed EGI corridor. The proposed Hoogland WEFs (and associated grid connections), and Nuweveld WEFs (and associated grid connections) by Red Cap fall within this radius. Only parts of the Nuweveld WEF would potentially be seen in combination with the proposed Mura solar projects and EGI, although the nature of the topography would largely screen these projects from each other. Cumulative Impacts have been assessed in the Cumulative Visual Impact summary, Table 12, below.

In addition, most of the proposed EGI would fall within the REDZ 11, except for a small portion to the north, and therefore renewable energy projects are contemplated in this zone.

Table 12: Cumulative Visual Impact

Nature of the impact: Visual effect of renewable energy projects, including EGI within 30km					
Description of Impact: Combined visual effect of existing and proposed renewable energy projects, including powerlines and switching stations, on scenic resources and sensitive receptors.					
	M+	**E+**	**R+**	**Dx**	**P=**
Without Mitigation Score	Medium 3	Regional 3	Recoverable 3	Permanent 5	Highly probable 4
With Mitigation Score	Medium 3	Regional 3	Recoverable 3	Permanent 5	Highly probable 4
Significance Calculation	**Without Mitigation**		**With Mitigation**		
(M+E+R+D) x P	N3 Moderate Impact (56)		N3 Moderate Impact (56)		
Mitigation measures: Mitigation only achievable by means of avoidance or reduction in the extent of energy facilities.					
Residual impact	Visual intrusion of renewable energy facilities and EGI on the exposed landscape.				

13 Mitigation and EMPR Requirements

Mitigation measures have been recommended for the EGI and related switching stations in the tables above, in order to minimise visual impacts on scenic resources and sensitive receptors.

Environmental Management Programme

Visual input into the Environmental Management Programme (EMPr) is discussed below. This should be included in the Environmental Authorisation for the project.

Construction Phase Monitoring:

Ensure that visual management measures are included as part of the EMPr, monitored by an Environmental Control Officer (ECO), including siting of any construction camps, stockpiles, temporary laydown areas and batching plants outside of identified no-go areas unless otherwise approved by the visual specialists, as well as the implementation of dust suppression and litter control measures. Rehabilitation efforts to commence immediately after construction activities are completed.

Responsibility: ECO / Contractor.
Timeframe: Preparation of EMPr during the planning phase. Monitoring during the construction phase.

Operation Phase Monitoring:

Ensure that visual mitigation measures are monitored by management on an on-going basis, including the maintenance of rehabilitated areas, as well as control of any signage, lighting and wastes at the proposed switching stations, with interim inspections by the responsible environmental officer.

Responsibility: Solar Farm Operator/Eskom (if the project is ceded to Eskom).
Timeframe: During the operational life of the project.

Decommissioning Phase Monitoring:

Ensure that procedures for the removal of structures during decommissioning are implemented, including recycling of materials and rehabilitation of the site to a visually acceptable standard, and signed off by the delegated authority.

It is assumed that some access roads and concrete pads would remain. Those that are not required should be ripped and vegetation or cropland reinstated to match the surroundings.

The revegetation measures are not described here as they would fall under the auspices of the vegetation/ biodiversity specialist.

Responsibility: ECO / Contractor / qualified rehabilitation ecologist or horticulturist.
Timeframe: During the decommissioning contract phase, as well as a prescribed maintenance period thereafter (usually one year).

14 Summary and Conclusion

Summary of Findings

The draft visual assessment is based on the EGI corridor. The corridor will include the project components listed in Table 1. Mitigation measures have been recommended in the tables of this Draft Visual Impact Assessment and these have been included where possible in the project layouts. Visual photomontages have been prepared to depict the current layout.

The preliminary visual assessment findings are the following:

- The viewshed is fairly extensive for the collector ring arrangement but localised based on the height of the pylons and switching stations.
- There are a number of visual receptors in the surroundings these being mainly small farmsteads and guest farms in some cases.
- The overall visual impact significance for the EGI and switching stations has been rated as medium, both before and after mitigation, as there would be some change in character to the area.
- The cumulative visual impact significance of the EGI, seen in combination with the Mura solar facilities and other renewable energy projects in the area has been rated as medium, as there would be limited inter-visibility between projects, and some of the projects being within the REDZ.

Conclusion and Impact Statement

The layout of the EGI powerline and switching stations has been subject to an iterative planning process, based on the various specialist findings, including the mapping of scenic resources and sensitive receptors. The currently proposed layout largely succeeds in avoiding visually sensitive areas as indicated on the visual sensitivity maps (Maps 7 and 8).

The cumulative visual impact of the Mura EGI and solar facilities could affect the rural quality of the area, but this would be fairly localised.

Specialist Recommendations for Inclusion in the EA

It is the opinion of the Visual Specialists that provided the recommended mitigation measures and EMPr are implemented, the project would not present a potential fatal flaw in visual terms and could be authorised.

References

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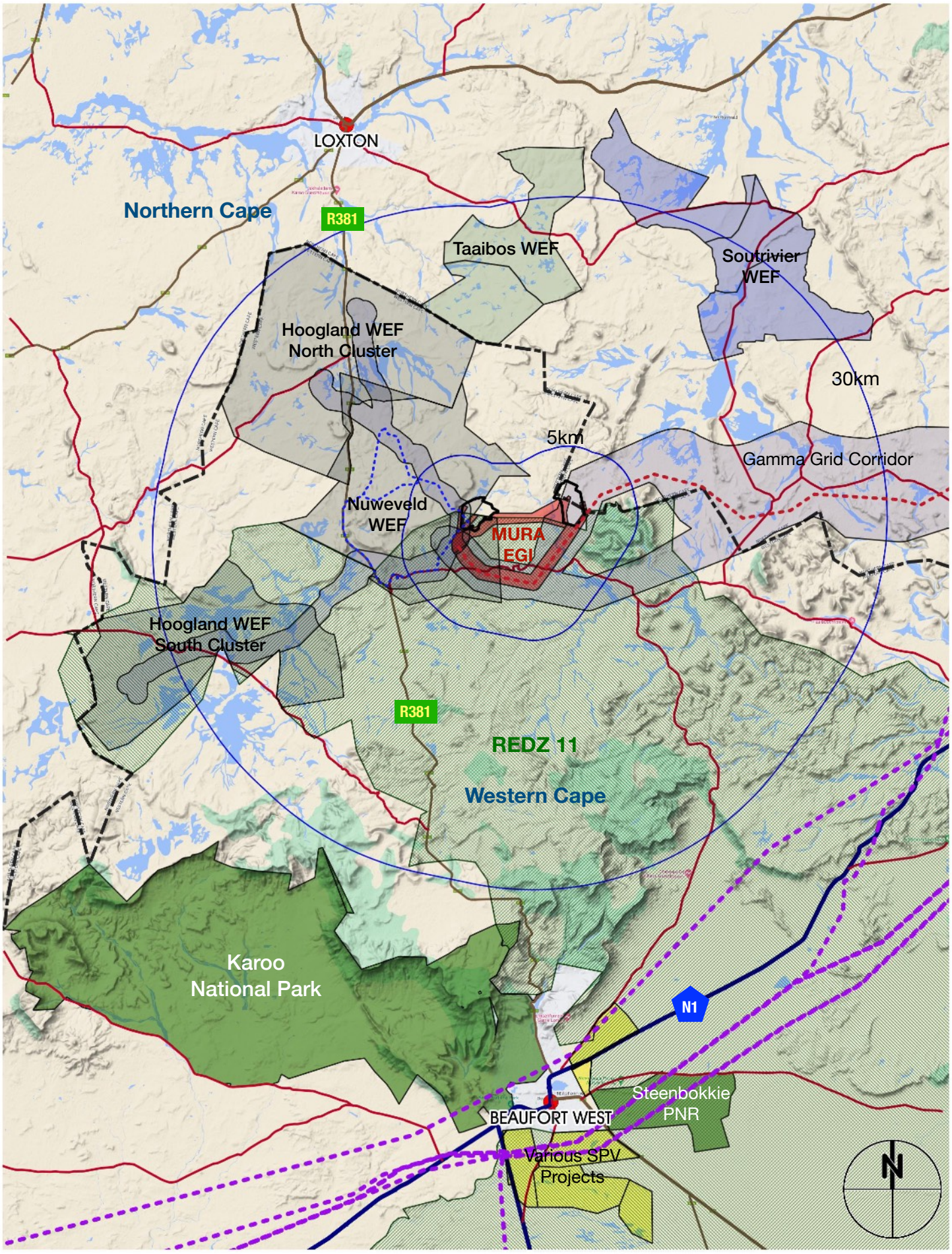


base map : Google Maps Terrain 2022

Map 1 : Mura EGI : Regional Locality

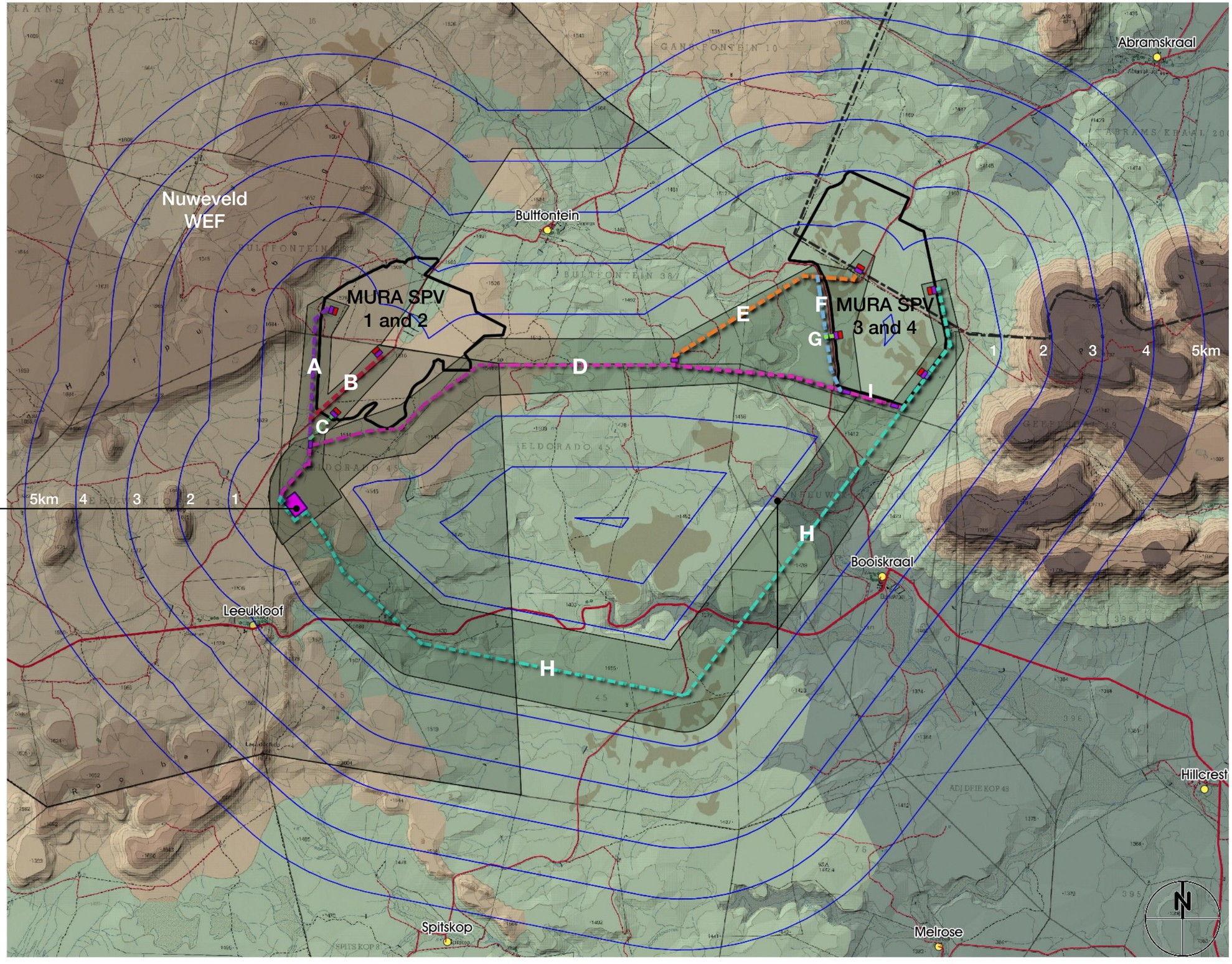
MURA EGI LEGEND :

- Mura Switch Stations
- Mura SubStations

Mura GRID Alignment Options

- Route A
- Route B
- Route C
- Route D
- Route E
- Route F
- Route G
- Route H
- Route I

Nuweveld WEF Collector Switching Station



ELEVATION :

- 1300 - 1400m
- 1400 - 1500 m
- 1500 - 1600 m
- 1600 - 1700 m
- 1700 - 1800 m

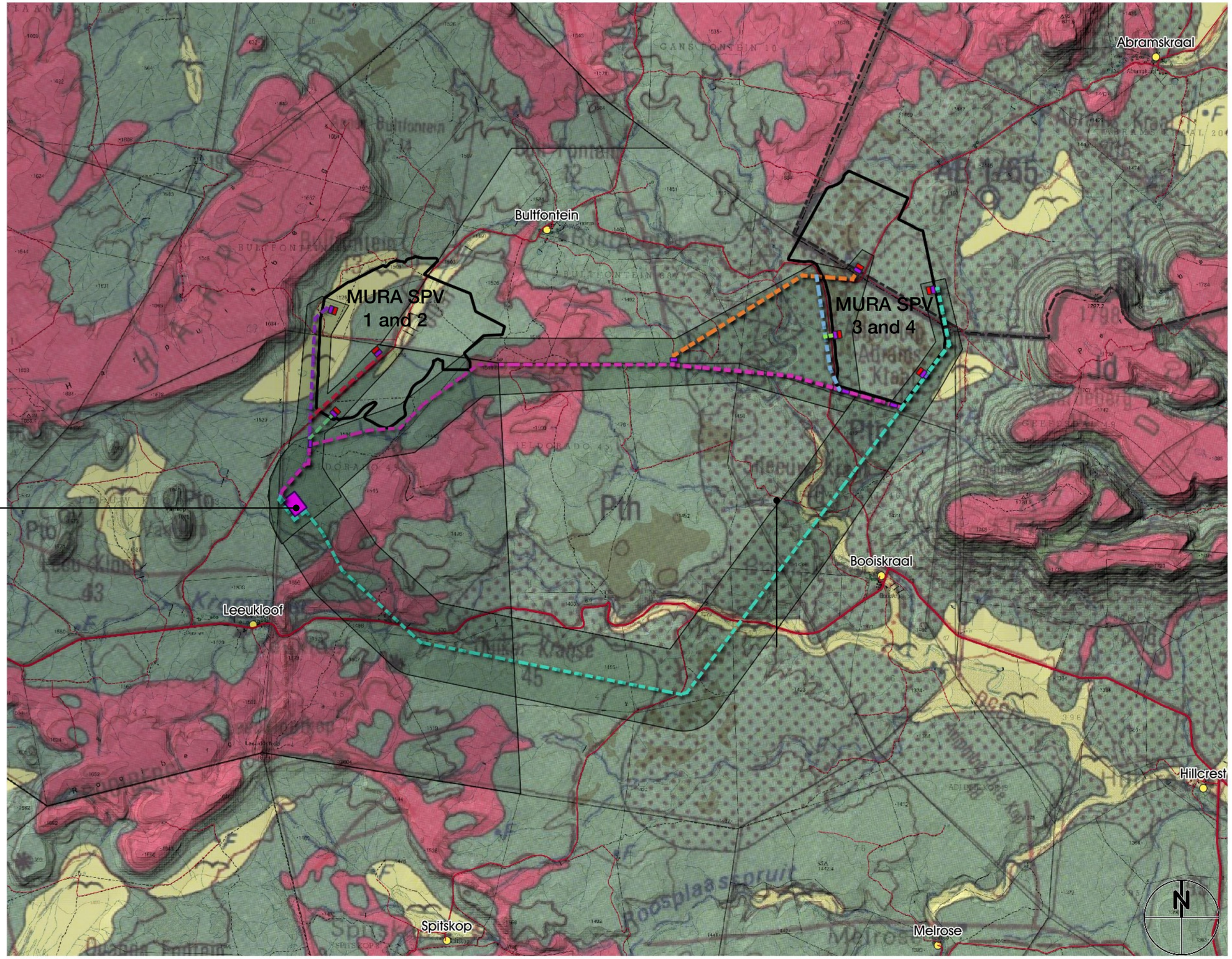
base map : NGI 50K Topographic Series : 3122CD Dunedin, DC Hillcrest

Map 2 : Mura EGI : Layout and Physiography

Geology Legend :

- Alluvium
- Jd — Dolerite
- Pth — Beaufort Group Mudstones and Sandstones (Hoedemaker)
- Ptp — Beaufort Group Mudstones and Sandstones (Poortjie)

Nuweveld WEF Collector Switching Station



base map : CGS : Victoria West 3122 Geology 250K

Map 3 : Mura EGI : Geology

Legend :

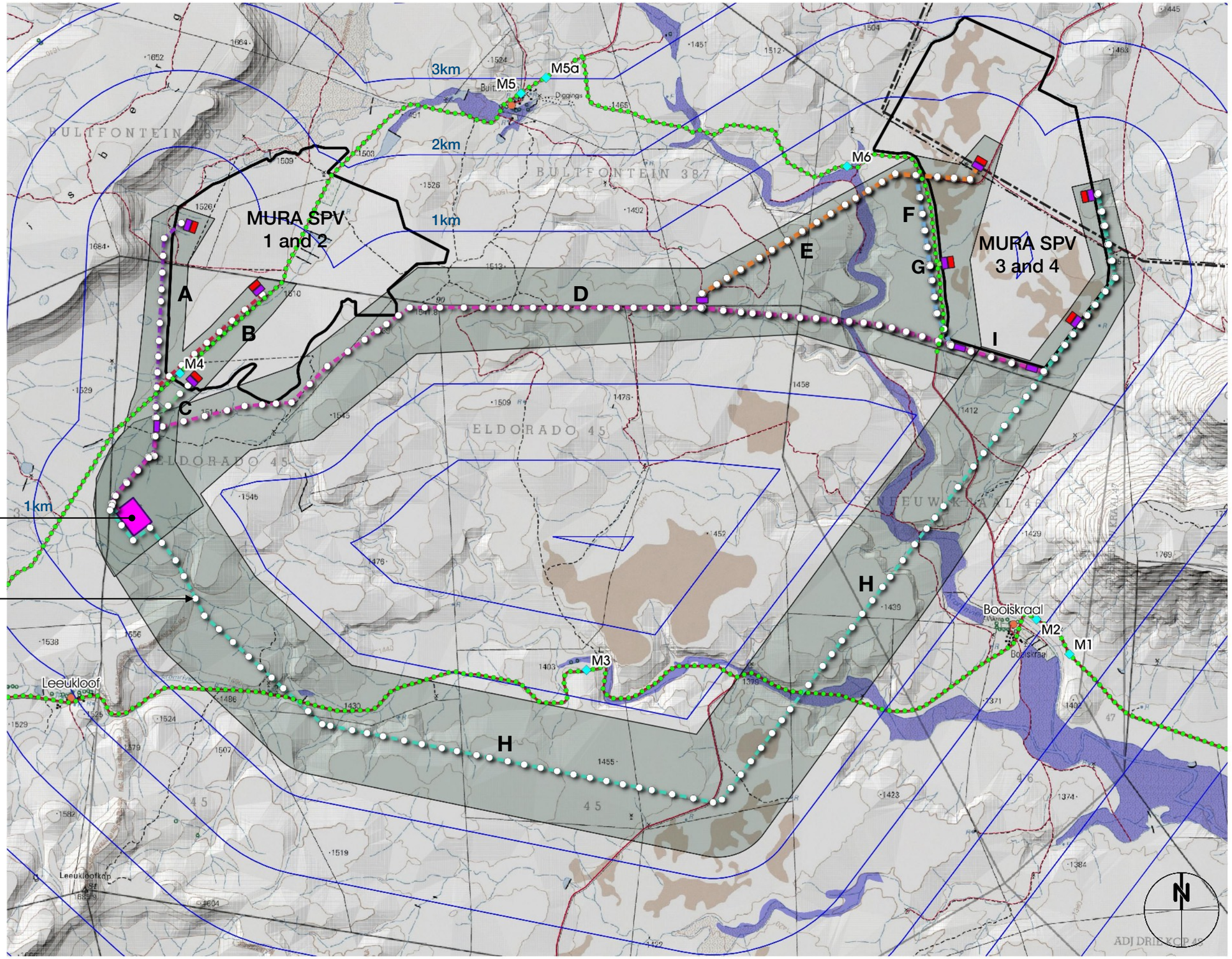
Fieldwork Track

M3 Viewpoints

EGI Pylons, Route Alignment within Corridor

Nuweveld WEF Collector Switching Station

Pylon Locations

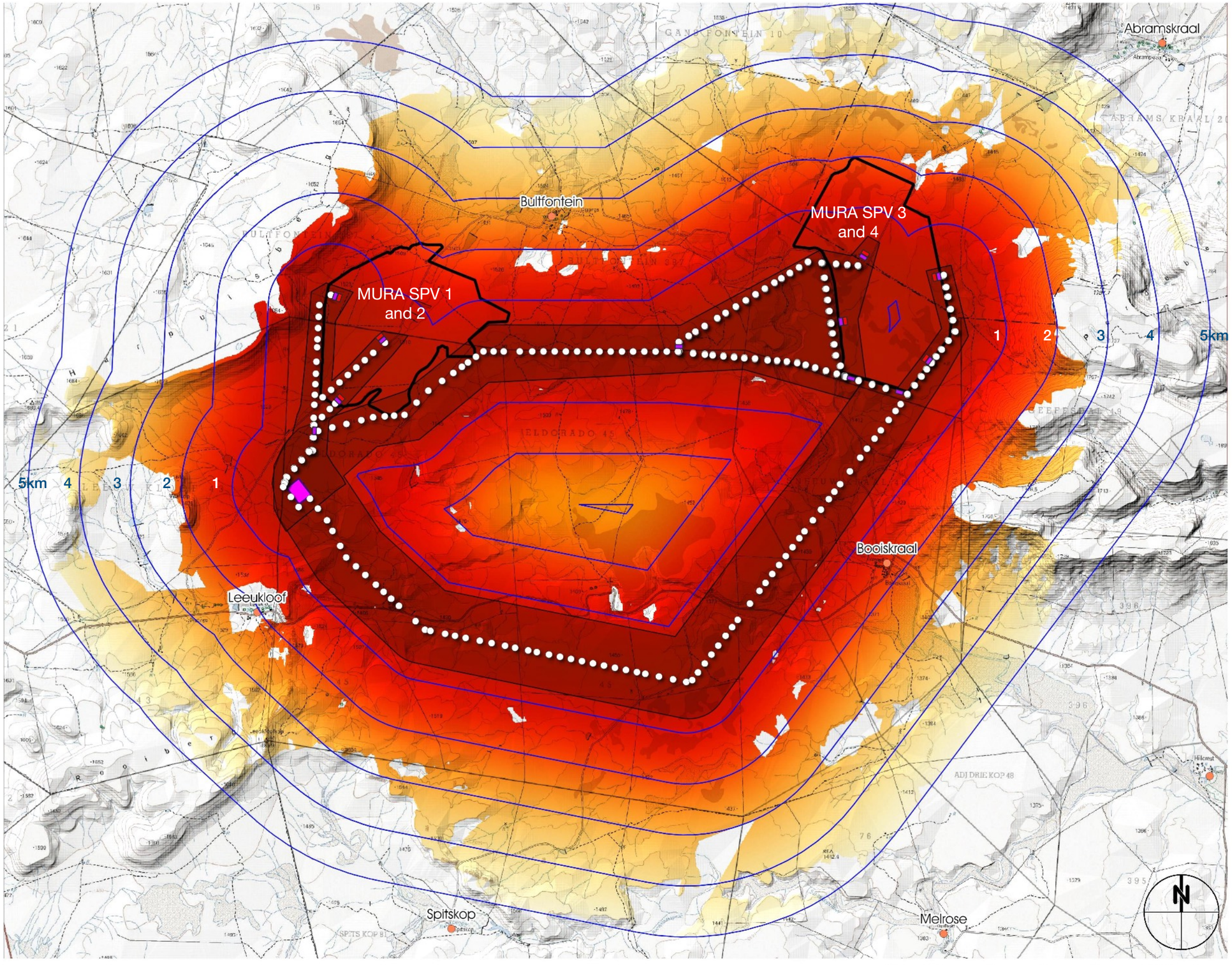


base map : NGI 50K Topographic Series : 3122CD Dunedin, DC Hillcrest

Map 4 : Mura EGI Corridors : Fieldwork

Viewshed Legend :

- High Visibility
- Medium Visibility
- Low Visibility
- No Visibility (View Shadow)



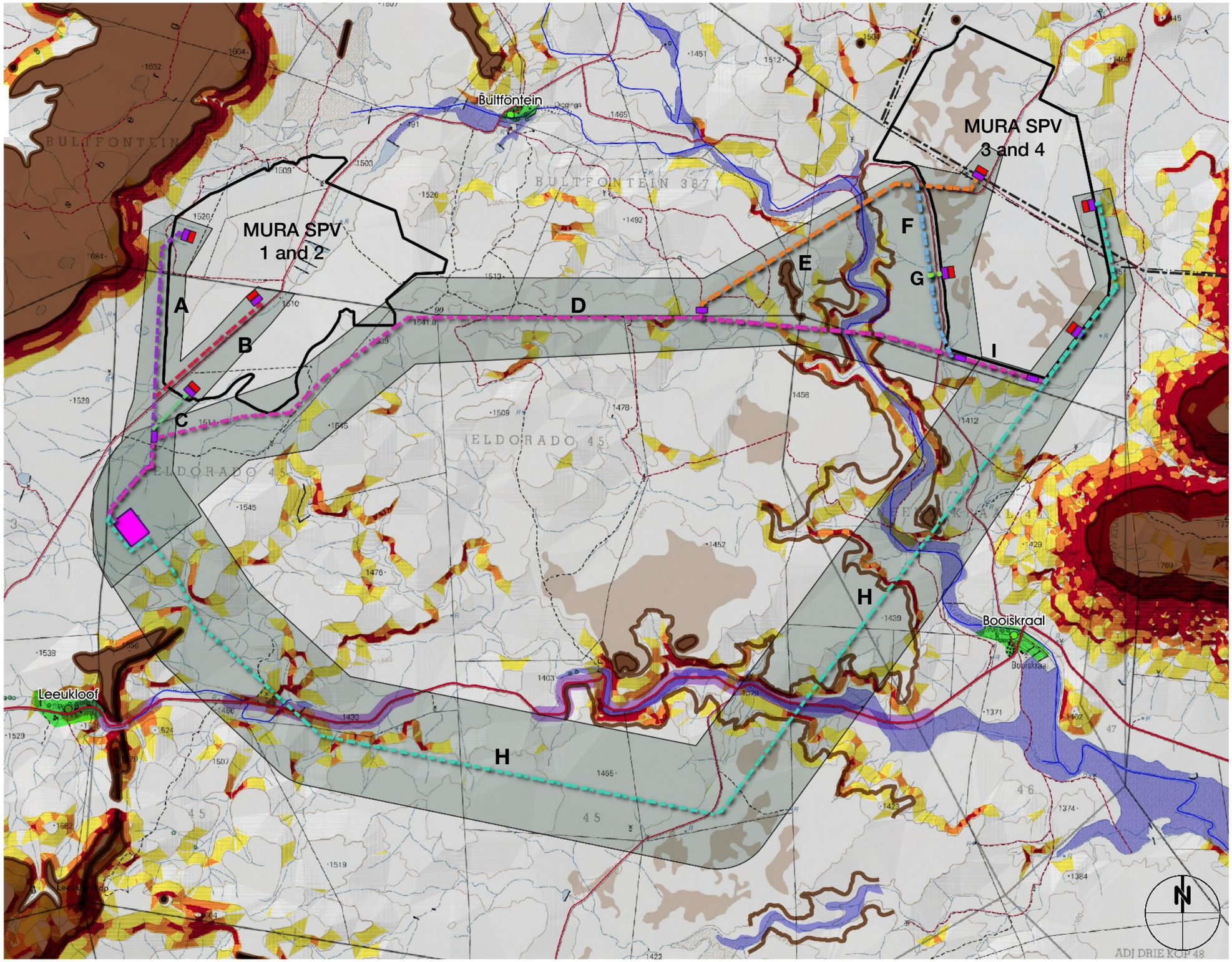
Note : Viewshed generated from Pylons at 38m High and SubStations at 12m High

base map : NGI 50K Topographic Series : 3122CD Dunedin, DC Hillcrest

Map 5 : Mura EGI : Nominal Viewshed : *(based on Pylons 38m and SubStations 12m high)*

LEGEND :

- Topographic Features
- YELLOW <1:10 slopes
  ORANGE 1:10 - 1:4 slopes,
  RED >1:4 + slopes
- Watercourses
- Cultural Landscapes
- Farmsteads
- Scenic Roads
- District Roads



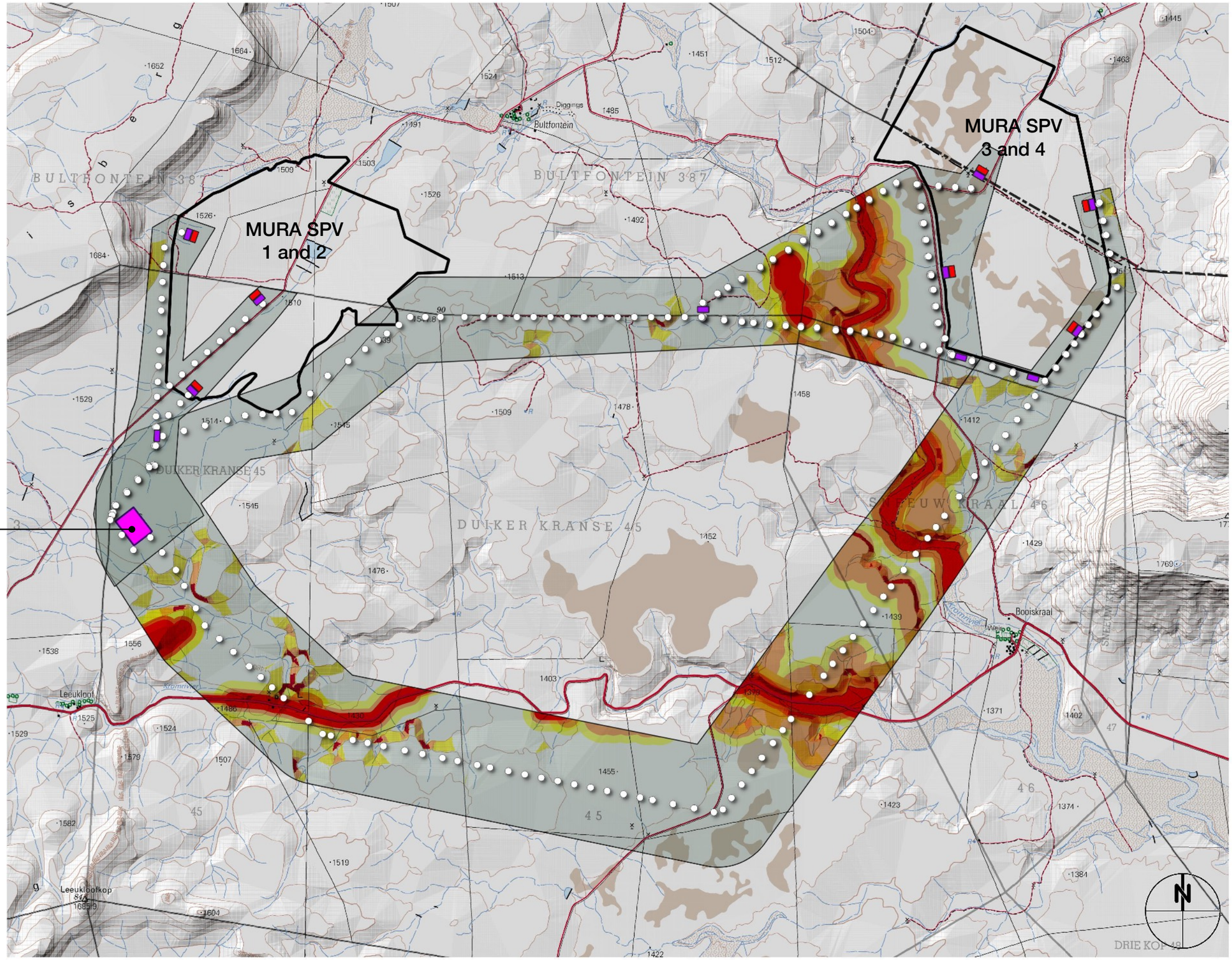
base map : NGI 50K Topographic Series : 3122CD Dunedin, DC Hillcrest

Map 6 : Mura EGI Corridors : Visual Features

Visual Sensitivity : EGI Pylons

- Very High - NoGo
- High Visual Sensitivity
- Medium Visual Sensitivity
- Low Visual Sensitivity

Nuweveld WEF Collector Switching Station



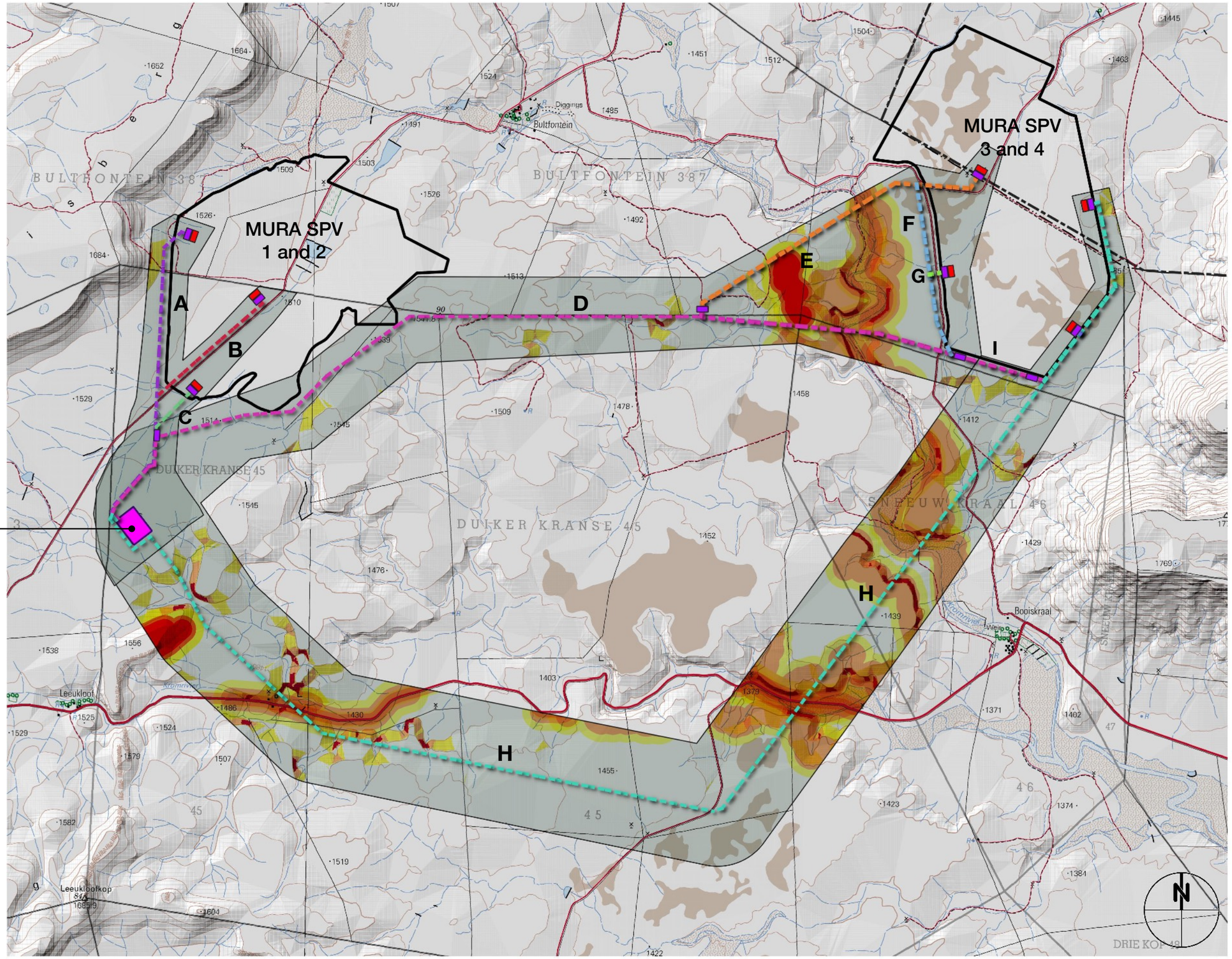
base map : NGI 50K Topographic Series : 3122CD Dunedin, DC Hillcrest

Map 7 : Mura EGI : Visual Sensitivity • Pylons

Visual Sensitivity : EGI OHL

- Very High - NoGo
- High Visual Sensitivity
- Medium Visual Sensitivity
- Low Visual Sensitivity

Nuweveld WEF Collector Switching Station



0 1 2 3 4 5 km

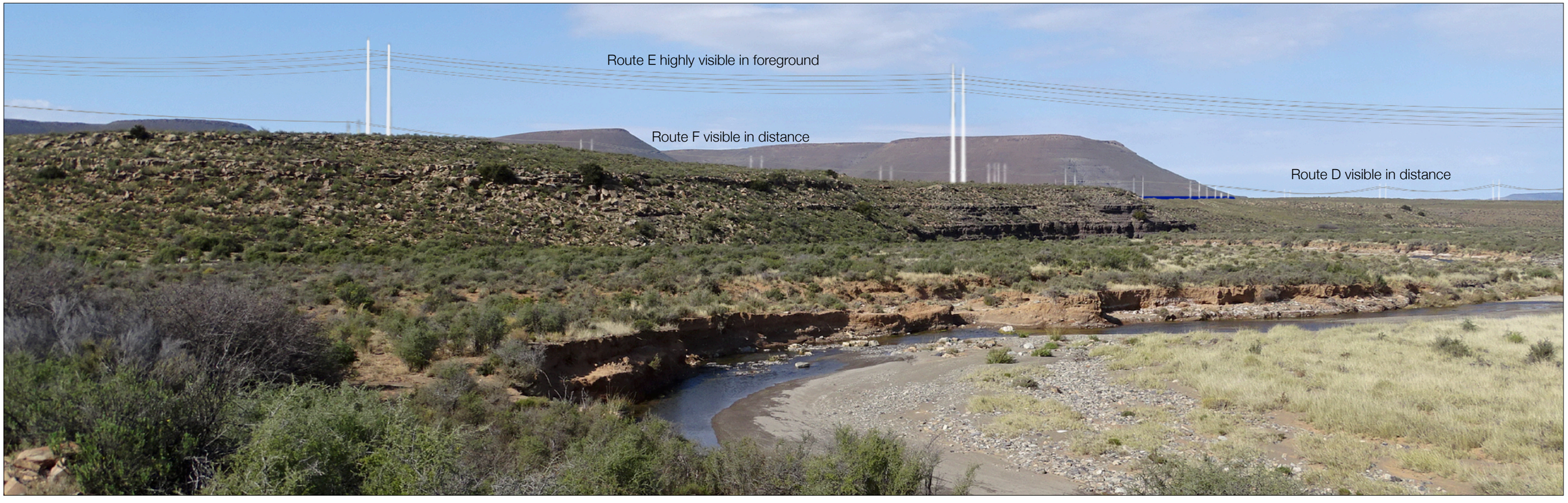
1:50,000

base map : NGI 50K Topographic Series : 3122CD Dunedin, DC Hillcrest

Map 8 : Mura EGI : Visual Sensitivity • Overhead Lines

Viewpoint M2 • looking North-West near Booiskraal Farm

Location : 31.865353S, 22.600844E distance : 1.87km



Viewpoint M6 • looking South-East from scenic area of farm road

Location : 31.812172S, 22.573683E distance : 412m to Route E pylon

Viewpoint Photomontages

Appendix A: Visual Specialists

Bernard Oberholzer, Landscape Architect
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Quinton Lawson, Architect
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Expertise

Bernard Oberholzer has a Bachelor of Architecture (UCT) and Master of Landscape Architecture (U. of Pennsylvania), and has more than 25 years' experience in undertaking visual impact assessments. He has presented papers on *Visual and Aesthetic Assessment Techniques*, and is the author of *Guideline for Involving Visual and Aesthetic Specialists in EIA Processes,* prepared in association with the CSIR for the Dept. of Environmental Affairs and Development Planning, Provincial Government of the Western Cape, 2005.

Quinton Lawson has a Bachelor of Architecture Degree (Natal) and has more than 15 years' experience in visual assessments, specialising in 3D modelling and visual simulations. He has previously lectured on visual simulation techniques in the Master of Landscape Architecture Programme at UCT.

The authors have been involved in visual assessments for a wide range of residential, industrial and renewable energy projects. They prepared the 'Landscape/Visual Assessment' chapter in the report for the *National Wind and Solar PV Strategic Environmental Assessment (SEA)*, as well as the *National Electricity Grid Infrastructure SEA* in association with the CSIR, for the then Department of Environmental Affairs in 2014-2015.

Appendix B: Impact Assessment Methodology

3 Environmental impact assessment

Reporting Requirements

- Project Description
- Legislative Context (as applicable)
- Assumptions and limitations
- Description of methodology (as required)
- Update and/or confirmation of Baseline Environment – including update and / or confirmation of sensitivity mapping
- Identification and description of Impacts
- Full impact assessment (including Cumulative)
- Mitigation measures
- Impact Statement

Ensure that all reports fulfil the requirements of the relevant Protocols.

Assessment of Impacts and Mitigation

The assessment of impacts and mitigation evaluates the likely extent and significance of the potential impacts on identified receptors and resources against defined assessment criteria, to develop and describe measures that will be taken to avoid, minimise or compensate for any adverse environmental impacts, to enhance positive impacts, and to report the significance of residual impacts that occur following mitigation.

The key objectives of the risk assessment methodology are to identify any additional potential environmental issues and associated impacts likely to arise from the proposed project, and to propose a significance ranking. Issues / aspects will be reviewed and ranked against a series of significance criteria to identify and record interactions between activities and aspects, and resources and receptors to provide a detailed discussion of impacts. The assessment considers direct[1], indirect[2], secondary[3] as well as cumulative[4] impacts.

A standard risk assessment methodology is used for the ranking of the identified environmental impacts pre-and post-mitigation (i.e. residual impact). The significance of environmental aspects is determined and ranked by considering the criteria[5] presented in Error! Not a valid bookmark self-reference..

[1] Impacts that arise directly from activities that form an integral part of the Project.
[2] Impacts that arise indirectly from activities not explicitly forming part of the Project.
[3] Secondary or induced impacts caused by a change in the Project environment.
[4] Impacts are those impacts arising from the combination of multiple impacts from existing projects, the Project and/or future projects.
[5] The definitions given are for guidance only, and not all the definitions will apply to all the environmental receptors and resources being assessed. Impact significance was assessed with and without mitigation measures in place.

Table 0-1: Impact Assessment Criteria and Scoring System

CRITERIA	SCORE 1	SCORE 2	SCORE 3	SCORE 4	SCORE 5
Impact Magnitude (M) The degree of alteration of the affected environmental receptor	Very low: No impact on processes	Low: Slight impact on processes	Medium: Processes continue but in a modified way	High: Processes temporarily cease	Very High: Permanent cessation of processes
Impact Extent (E) The geographical extent of the impact on a given environmental receptor	Site: Site only	Local: Inside activity area	Regional: Outside activity area	National: National scope or level	International: Across borders or boundaries
Impact Reversibility (R) The ability of the environmental receptor to rehabilitate or restore after the activity has caused environmental change	Reversible: Recovery without rehabilitation		Recoverable: Recovery with rehabilitation		Irreversible: Not possible despite action
Impact Duration (D) The length of permanence of the impact on the environmental receptor	Immediate: On impact	Short term: 0-5 years	Medium term: 5-15 years	Long term: Project life	Permanent: Indefinite
Probability of Occurrence (P) The likelihood of an impact occurring in the absence of pertinent environmental management measures or mitigation	Improbable	Low Probability	Probable	Highly Probability	Definite
Significance (S) is determined by combining the above criteria in the following formula:	$[S = (E + D + R + M) \times P]$ $Significance = (Extent + Duration + Reversibility + Magnitude) \times Probability$				
IMPACT SIGNIFICANCE RATING					
Total Score	**4 to 15**	**16 to 30**	**31 to 60**	**61 to 80**	**81 to 100**
Environmental Significance Rating (Negative (-))	**Very low**	**Low**	**Moderate**	**High**	**Very High**
Environmental Significance Rating (Positive (+))	**Very low**	**Low**	**Moderate**	**High**	**Very High**

Impact Mitigation

The impact significance without mitigation measures will be assessed with the design controls in place. Impacts without mitigation measures in place are not representative of the proposed development's actual extent of impact and are included to facilitate understanding of how and why mitigation measures were identified. The residual impact is what remains following the application of mitigation and management measures and is thus the final level of impact associated with the development. Residual impacts also serve as the focus of management and monitoring activities during Project implementation to verify that actual impacts are the same as those predicted in this report.

The mitigation measures chosen are based on the mitigation sequence/hierarchy which allows for consideration of five (5) different levels, which include avoid/prevent, minimise, rehabilitate/restore, offset and no-go in that order. The idea is that when project impacts are considered, the first option should be to avoid or prevent the impacts from occurring in the first place if possible, however, this is not always feasible. If this is not attainable, the impacts can be allowed, however they must be minimised as far as possible by considering reducing the footprint of the development for example so that little damage is encountered. If impacts are unavoidable, the next goal is to rehabilitate or restore the areas impacted back to their original form after project completion. Offsets are then considered if all the other measures described above fail to remedy high/significant residual negative impacts. If no offsets can be achieved on a potential impact, which results in full destruction of any ecosystem for example, the no-go option is considered so that another activity or location is considered in place of the original plan.

The mitigation sequence/hierarchy is shown in **Figure 1** below.

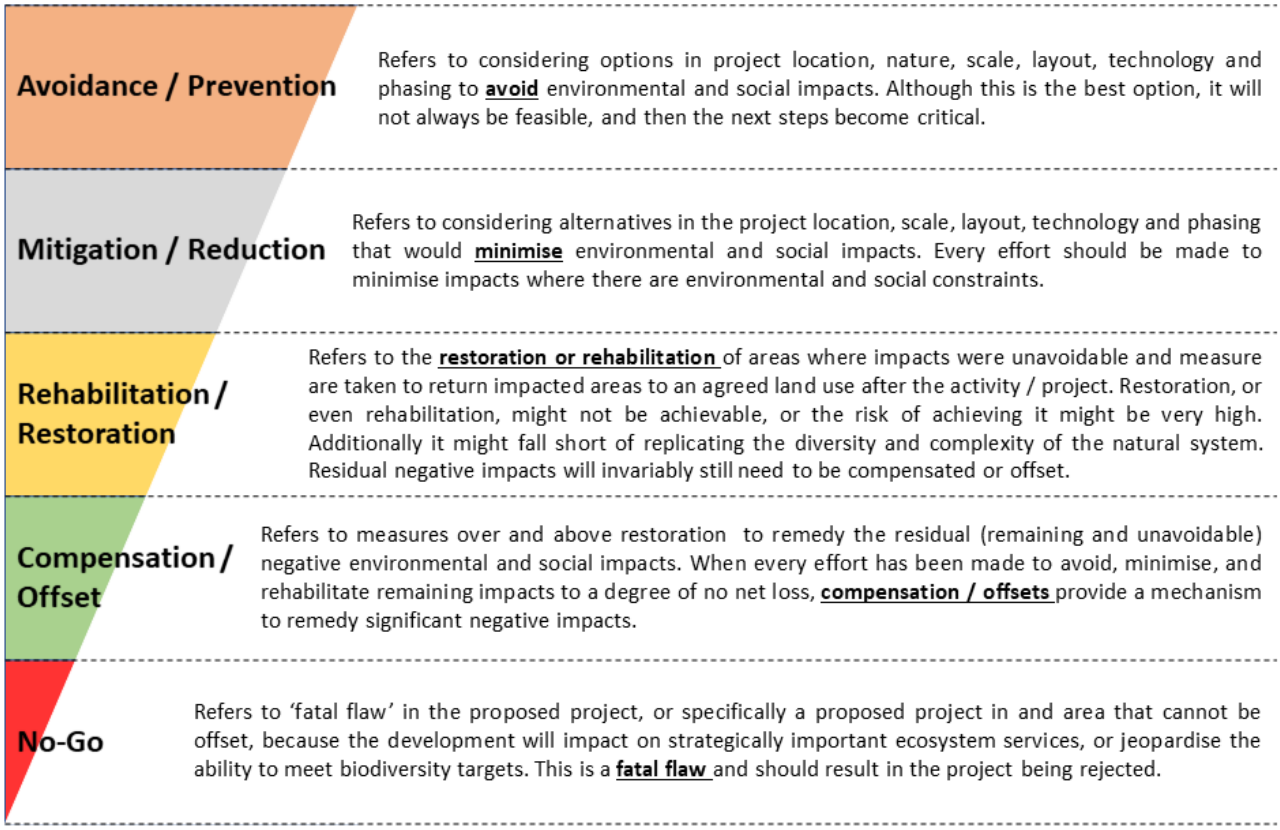

Figure 1: Mitigation Sequence/Hierarchy