

Umsinde Emoyeni Wind Energy Facility,
Western Cape and Northern Cape
for

Emoyeni Wind Farm Project (Pty) Ltd

Addendum to Visual Impact Assessment

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Prepared for
Arcus Consultancy Services

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1 Introduction

This report serves as an Addendum to the Visual Impact Assessment (VIA) prepared for the Umsinde Emoyeni Wind Energy Facility (WEF) in September 2015, and the two documents should be read together.

The Addendum includes an evaluation of both the previous 2015 and the current WEF proposals to illustrate the changes to the layout and facilitate a comparison between the two proposals.

2 Description of the Proposed Revised WEF Project

The currently proposed Umsinde Emoyeni WEF, referred to as 'Version W' (2018), would consist of 2 phases of development, the main difference from the previous proposals of 2015 being that each phase would have approximately 35 wind turbines instead of 98 turbines, (but still 147 MW capacity for each phase). The layout of the turbines has also changed, taking the various constraints into account, according to information provided by Arcus.

The turbines have been moved further north, away from the Trouberg and sensitive receptors. Distances from sensitive receptors have increased in some cases, and with the fewer turbines, the viewshed is less extensive, particularly towards the south. The net 5m increase in height of the turbines tends to have little effect on the extent of the viewshed.

A proposed new 132kV overhead transmission line between the on-site substations and the planned Ishwati Emoyeni WEF about 38km to the west would remain the same as in the previous proposal. The route for the powerlines would include a servitude corridor of up to 73m width. The final design of the support structures / pylons is not yet known.

A detailed list of facilities relating to the currently proposed WEF is given in Table 1 below, and in the indicative 3D models in Figs. 4 and 5.

Table 1: Description of current Version V WEF Proposal

Facility	Footprint	Height	Comments
Total site area WEF area:	58100 ha Phase 1: 5 484ha Phase 2: 9 668ha	n/a n/a	Leased areas. Development areas may be smaller.
No. of wind turbines: Phase 1 Phase 2	1.5 to 5MW max. 35 turbines max. 35 turbines	Hub ht. up to 135m Rotor diam. up to 140m (depending on final selection of turbine type)	Each phase 140MW (contracted capacity of up to 140 MW, and an installed capacity of up to 147 MW) Off-white / grey
Electrical turbine transformer.	4m ² (2x2m) each turbine.	2.5 m	Colour: Off-white / grey
Turbine pad. Hardstanding area / crane pad.	Approx. 400m ² Approx. 60 x 30m	n/a n/a	Visible concrete pad after construction. Compacted gravel hardstanding.
Internal access tracks: Phase 1 Phase 2	79.99km 118.88km	n/a	Max. 9m wide during construction. 6m wide during operation. Gravel surface.
Electrical substation	200 x 250 m substation	Single storey buildings Gantries approx. 10m	Earth-colour building and roof finish.
Wind measuring masts	5 x 80 m met masts remain on site post construction at each phase.		Mast type: monopole or lattice with guy-lines.
Transmission lines: 132kV line between on-site substation and Ishwati Emoyeni WEF.	38.5km	Up to 40m height.	33 or 66kV internal lines are mainly underground. Monopole or lattice pylon.
Operations and maintenance buildings (O&M building) and possible visitor/ education centre.	150 x 80 m	Single storey	Earth-colour plastered and painted masonry buildings or steel portal frame structures. No reflective finishes.
Fuel storage			Unknown
Security fencing	n/a	2 m	Possibly around substation and O&M buildings.
Security Lighting Navigation lights	n/a For selected turbine nacelles as per CAA	At hub height.	At substation and O&M buildings. Flashing red light on selected turbines only (to CAA requirements).
Construction Phase:			
Lay down area, construction camp and batching plant	150 x 60 m (for each phase)	Single storey	Temporary gravel hard standing and prefab structures. No on-site construction accommodation.
Borrow pits	Not established	n/a	From development site and/or imported from the district.

3 Visual Assessment Criteria

The visual assessment for the previous layout was based on a number of quantitative and qualitative criteria to determine potential visual impacts, as well as their relative significance. The criteria are listed again below, and updated to reflect the new layout:

Visibility (Figure 2a)

Visibility is determined by distance between the energy facilities and the viewer. In some cases the distance has increased in the latest layout, mainly because there are fewer turbines, and therefore levels of visibility would be reduced. (See Table 2 below).

High visibility:	Prominent feature within the observer's viewframe 0-2.5km
Mod-high visibility:	Relatively prominent within observer's viewframe 2.5-5km
Moderate visibility:	Only prominent with clear visibility as part of the wider landscape 5-15km
Marginal visibility:	Seen in very clear visibility as a minor element in the landscape 15-30km+

Table 2: Potential Visibility

View point	Location	Coordinates	Distance	Phase	Visibility
VP1	Essex	32.0262S, 24.1343E	19.43km	1	Not Visible
VP2	Marino	32.0008S, 24.0994E	15.56km	1	Not Visible
VP3	Poortjie	31.9825S, 24.0600E	12.70km	1	Moderate
VP4	Witteklip	31.9014S, 24.0702E	4.42km	1	High
VP5	Rhenosterfontein	31.7482S, 24.0921E	8.87km	2	Moderate
VP6	Avontuur	31.6701S, 24.0614E	16.27km	2	Not Visible
VP7	Philipskraal	31.7712S, 24.0484E	5.54km	2	High
VP8	Vleiplaats	31.9818S, 23.8395E	19.02km	1	Not Visible
VP9	Badsfontein gate	31.8016S, 23.7373E	15.27km	2	Marginal
VP10	Badsfontein opstal	31.7935S, 23.7433E	14.84km	2	Marginal
VP11	Badsfontein dam	31.7949S, 23.7455E	14.60km	2	Marginal
VP12	Elandspoort	31.6164S, 23.7734E	23.19km	2	Not Visible
VP13	Ratelfontein ridge	31.6162S, 23.6745E	29.32km	2	Not Visible
VP14	Ratelfontein east	31.6269S, 23.6833E	27.92km	2	Marginal
VP15	Ratelfontein saddle	31.6262S, 23.6769E	28.43km	2	Marginal
VP16	Rooisandheuwel	31.6885S, 23.7959E	15.51km	2	Marginal
VP17	Snyderskraal	31.8500S, 23.7432E	15.06km	2	Marginal
VP18	Brookfield	31.8882S, 23.7233E	18.27km	2	Marginal
VP19	Murraysburg town	31.9627S, 23.7711E	20.08km	2	Not Visible
VP20	Brandkraal	31.9638S, 23.7406E	22.01km	2	Not Visible

Visual Exposure (Figures 3 and 3a)

Viewsheds are compared for both the previous and the current WEF proposals. The viewshed for the current WEF proposed layout is marginally reduced from that of the previous proposal because of the fewer number of turbines.

Visual Sensitivity (Figures 6 and 7)

Visual sensitivity is determined by topographic features, steep slopes, rivers, scenic routes, cultural landscapes, and tourist facilities such as guest farms. These, together with the related setbacks have been mapped on the Visual Informants Maps.

Landscape Integrity

Visual quality is enhanced by the scenic or rural quality and intactness of the landscape, as well as lack of other visual intrusions. The Karoo landscape of the study area is at present generally intact with few visual intrusions. Both the previous and current WEF proposals have potential significance in terms of altering the rural landscape.

Cultural Landscape

Besides natural attributes, landscapes have a cultural value, enhanced by the presence of palaeontological and archaeological sites, historical settlements, farmsteads and cultivated lands. The mapping of these would be further informed by the heritage specialist study.

Visual Absorption Capacity

Ridges and koppies tend to have a screening effect at the broader scale, but the study area is otherwise relatively open and visually exposed in terms of the immediate surroundings, and therefore locally has a relatively low visual absorption capacity.

Cumulative Visual Impact

This is the accumulation of visual impacts in the area, particularly in relation to other existing or proposed energy projects and industrial-type facilities in the immediate area, (see Fig. 1). The currently proposed layout, with approximately 35 turbines in each of the 2 phases, would potentially have less of a cumulative visual effect than the previous layout with 98 turbines proposed in each phase.

The proposed Ishwati Emoyeni WEF (80 proposed turbines) adjacent to the project site, would increase the cumulative visual effect. Seen together, these WEF projects, along with their associated substations and powerlines, could have a significant visual effect on the visual character and scenic resources of the area.

The Victoria West WEF (30 wind turbines), the Noblesfontein WEF, (under construction), and the approved Modderfontein WEF, are all to the west of the N1, about 50km away, and would not be visible from the Umsinde Emoyeni project area.

Visual Impact Assessment

The criteria above are considered in combination to determine the potential visual impact 'intensity' for both the previous and the current proposed layouts as indicated in Tables 3a and 3b. The photomontages in Figures 10 to 13 were also used to determine visual impact.

The significance of the potential visual impacts is assessed through a number of steps in Tables 4 and 5. The impacts are then re-assessed, both without and with essential mitigations, in Tables 6 and 7 for both layouts.

4 Visual Assessment Methodology

The visual impact assessment ratings used in the tables below are based on the same methodology provided by Arcus for the previous layout in 2015.

Table 3a: Comparison of Intensity of Potential Visual Impacts (**Phase 1**)

Criteria	Comments	Previous turbine layout	Current Version W layout	Previous power-line	Current power-line	Prev. construction	Current construction
Visibility of facilities Distance from selected viewpoints (Table 3)	Viewing distances are marginally further for the current proposals from those of the previous proposals.	High (4)	High (4)	High (4)	High (4)	High (4)	High (4)
Visual exposure Zone of visual influence	Visual exposure is marginally less for the current proposal, covering a slightly smaller geographic area.	Medium (3)	Medium (3)	High (4)	High (4)	Medium (3)	Medium (3)
Visual sensitivity Effect on landscape features	Visual sensitivity of the landscape is slightly less for the current layout.	High (4)	Medium (3)	High (4)	High (4)	High (4)	Medium (3)
Landscape integrity Effect on rural/natural character of the area	Effect on landscape integrity would be similar for both previous and current layouts.	Very high (5)	Very high (5)	High (4)	High (4)	Very high (5)	Very high (5)
Visual absorption capacity (VAC)	VAC is similar for both proposals.	Medium (3)	Medium (3)	Medium (3)	Medium (3)	Medium (3)	Medium (3)
Overall visual impact intensity	Combination of characteristics above.	High (19)	High (18)	High (19)	High (19)	High (19)	High (19)

Table 3b: Comparison of Intensity of Potential Visual Impacts (**Phase 2**)

Criteria	Comments	Prev. turbine layout	Current turbine layout	Prev. power-line	Current power-line	Prev. construction	Current construction
Visibility of facilities Distance from selected viewpoints (Table 3)	Viewing distances further for the current proposals reducing the visibility of the turbines in some cases.	Very high (5)	High (4)	Medium (3)	Medium (3)	Very high (5)	High (4)

Visual exposure Zone of visual influence	Visual exposure marginally less for the current proposal, covering a slightly smaller geographic area.	High (4)	High (4)	Medium (3)	Medium (3)	High (4)	High (4)
Visual sensitivity Effect on landscape features	Visual sensitivity of landscape is similar for both previous and the current layouts.	High (4)	Medium (3)	Medium (3)	Medium (3)	High (4)	Medium (3)
Landscape integrity Effect on rural/natural character of the area	Effect on landscape integrity would be similar for both previous and current layouts.	Very high (5)	Very high (5)	Medium (3)	Medium (3)	Very high (5)	Very high (5)
Visual absorption capacity (VAC)	VAC is similar for both proposals.	Medium (3)	Medium (3)	Medium (3)	Medium (3)	Medium (3)	Medium (3)
Overall visual impact intensity	Combination of the characteristics above.	Very high (21)	High (19)	Medium (15)	Medium (15)	Very high (21)	High (19)

Rating values: Very low (1), Low (2), Medium (3), High (4), and Very high (5).

Overall values: Very low (1-5), Low (6-10), Medium (11-15), High (15-20), Very high (21+)

Table 4a: Visual Impacts (Phase 1): Wind turbines

Rating	Definition of Rating	Previous	Current
A. Extent – the area over which the impact will be experienced			
Local	Confined to study area (approx. 30km radius)	1	1
B. Intensity – the magnitude of the impact in relation to the sensitivity of the receiving environment, taking into account the degree to which the impact may cause irreplaceable loss of resources			
High	Visual or scenic characteristics of the area are severely altered	3	3
C. Duration – the timeframe over which the impact will be experienced and its reversibility			
Long-term	More than 15 years. (Impact could be reversed at decommissioning stage)	3	3
Consequence	A+B+C (7)	High	High
Probability	Likelihood of the impact occurring (>90%)	Definite	Definite
Significance	High consequence + Definite	HIGH	HIGH
Status	Negative or positive	-ve	-ve
Confidence	Based on photomontages	High	High

Table 4b: Visual Impacts (Phase 1): Powerlines / Infrastructure

Rating	Definition of Rating	Previous	Current
A. Extent – the area over which the impact will be experienced			
Local	Confined to study area (approx. 20km radius)	1	1
B. Intensity – the magnitude of the impact in relation to the sensitivity of the receiving environment, taking into account the degree to which the impact may cause irreplaceable loss of resources			
High	Visual or scenic characteristics severely altered	3	3
C. Duration – the timeframe over which the impact will be experienced and its reversibility			
Long-term	More than 15 years. (Impact could be reversed at decommissioning stage)	3	3
Consequence	A+B+C (7)	High	High
Probability	Likelihood of the impact occurring (>90%)	Definite	Definite
Significance	High consequence + Definite	HIGH	HIGH
Status	Negative or positive	-ve	-ve
Confidence	Based on photomontages	High	High

Table 4c: Visual Impacts (Phase 1): Construction Phase of WEF

Rating	Definition of Rating	Previous	Current
A. Extent – the area over which the impact will be experienced			
Local	Confined to study area (approx. 30km radius)	1	1
B. Intensity – the magnitude of the impact in relation to the sensitivity of the receiving environment, taking into account the degree to which the impact may cause irreplaceable loss of resources			
High	Visual or scenic characteristics of the area are severely altered	3	3
C. Duration – the timeframe over which the impact will be experienced and its reversibility			
Short-term	Less than 2 years.	1	1
Consequence	A+B+C (5)	Low	Low
Probability	Likelihood of the impact occurring (70-90%)	Probable	Probable
Significance	Low consequence + Probable	LOW	LOW
Status	Negative or positive	-ve	-ve
Confidence	Based on photomontages	Medium	Medium

Table 5a: Visual Impacts (Phase 2): Wind turbines

Rating	Definition of Rating	Previous	Current
A. Extent – the area over which the impact will be experienced			
Local	Confined to study area (approx. 30km radius)	1	1
B. Intensity – the magnitude of the impact in relation to the sensitivity of the receiving environment, taking into account the degree to which the impact may cause irreplaceable loss of resources			
High	Visual or scenic characteristics of the area are severely altered	3	3
C. Duration – the timeframe over which the impact will be experienced and its reversibility			
Long-term	More than 15 years. (Impact could be reversed at decommissioning stage)	3	3
Consequence	A+B+C (7)	High	High
Probability	Likelihood of the impact occurring (>90%)	Definite	Definite
Significance	High consequence + Definite	HIGH	HIGH
Status	Negative or positive	-ve	-ve
Confidence	Based on photomontages	High	High

Table 5b: Visual Impacts (Phase 2): Powerlines / Infrastructure

Rating	Definition of Rating	Previous	Current
A. Extent – the area over which the impact will be experienced			
Local	Confined to study area (approx. 20km radius)	1	1
B. Intensity – the magnitude of the impact in relation to the sensitivity of the receiving environment, taking into account the degree to which the impact may cause irreplaceable loss of resources			
Medium	Visual or scenic characteristics of the area are moderately altered	2	2
C. Duration – the timeframe over which the impact will be experienced and its reversibility			
Long-term	More than 15 years. (Impact could be reversed at decommissioning stage)	3	3
Consequence	A+B+C (6)	Medium	Medium
Probability	Likelihood of the impact occurring (>90%)	Definite	Definite
Significance	High consequence + Definite	MEDIUM	MEDIUM
Status	Negative or positive	-ve	-ve
Confidence	Based on photomontages	High	High

Table 5c: Visual Impacts (Phase 2): Construction Phase of WEF

Rating	Definition of Rating	Previous	Current
A. Extent – the area over which the impact will be experienced			
Local	Confined to study area (approx. 30km radius)	1	1

B. Intensity – the magnitude of the impact in relation to the sensitivity of the receiving environment, taking into account the degree to which the impact may cause irreplaceable loss of resources			
High	Visual or scenic characteristics of the area are severely altered	3	3
C. Duration – the timeframe over which the impact will be experienced and its reversibility			
Short-term	Less than 2 years.	1	1
Consequence	A+B+C (5)	Low	Low
Probability	Likelihood of the impact occurring (70-90%)	Probable	Probable
Significance	Low consequence + Probable	LOW	LOW
Status	Negative or positive	-ve	-ve
Confidence	Based on photomontages	Medium	Medium

Table 6a: Visual Impacts with mitigations (Phase 1): Wind turbines

	Extent	Intensity	Duration	Consequence	Probability	Significance	Status	Confidence
Previous without mitigation	Local 1	High 3	Long-term 3	High 7	Definite	HIGH	- ve	High
Current without mitigation	Local 1	High 3	Long-term 3	High 7	Definite	HIGH	- ve	High
Essential mitigation measures: (See Fig. 13)								
a) Visually sensitive peaks, major ridgelines and scarp edges, including 500m buffers, to be avoided, because of silhouette effect on the skyline over large distances. Peaks marked in yellow are important topographic features to be avoided in particular. b) Slopes steeper than 1:5 gradient to be avoided. c) Cultural landscapes or valuable cultivated land, particularly along alluvial river terraces to be avoided. d) Stream features, including 250m buffers, to be avoided. e) Buffers around settlements, farmsteads and roads to be observed.								
Previous with mitigation	Local 1	Medium 2	Long-term 3	Medium 6	probable	MEDIUM	- ve	Medium
Current with mitigation	Local 1	Medium 2	Long-term 3	Medium 6	probable	MEDIUM	- ve	Medium

Table 6b: Visual Impacts with mitigations (Phase 1): Powerlines / Infrastructure

	Extent	Intensity	Duration	Consequence	Probability	Significance	Status	Confidence
Previous without mitigation	Local 1	High 3	Long-term 3	High 7	Definite	HIGH	- ve	High
Current without mitigation	Local 1	High 3	Long-term 3	High 7	Definite	HIGH	- ve	High
Essential mitigation measures:								
a) Powerlines to avoid Visually sensitive peaks, major ridgelines, scarp edges and slopes steeper than 1:5 gradient. b) Internal connecting powerlines to be below ground where possible, particularly on visually exposed ridges. (in areas of shallow bedrock, powerlines could be covered with overburden). c) Substations to be sited in unobtrusive, low-lying areas, away from roads and habitations, and screened by berms and/or tree-planting where feasible. d) Operations and maintenance buildings and parking areas to be located in an unobtrusive area and consolidated to avoid sprawl of buildings in the open landscape. e) Access roads to be in sympathy with the contours, avoid steep 1:5 slopes and drainage courses, and kept as narrow as possible.								

Previous with mitigation	Local 1	Medium 2	Long-term 3	Medium 6	probable	MEDIUM	- ve	Medium
Current with mitigation	Local 1	Medium 2	Long-term 3	Medium 6	probable	MEDIUM	- ve	Medium

Table 6c: Visual Impacts with mitigations (Phase 1): Construction

	Extent	Intensity	Duration	Consequence	Probability	Significance	Status	Confidence
Previous without mitigation	Local 1	High 3	Short-term 1	Low 5	Probable	LOW	- ve	Medium
Current without mitigation	Local 1	High 3	Short-term 1	Low 5	Probable	LOW	- ve	Medium
Essential mitigation measures:								
a) Access and haul roads to use existing farm tracks as far as possible. b) Construction camp, stockpiles and lay-down area to be located out of sight of district roads, possibly in the vicinity of the proposed substation and O&M buildings. c) Disturbed areas rather than pristine or intact land to preferably be used for the construction camp. Construction camp and laydown areas to be limited in area to only that which is essential. d) Measures to control wastes and litter to be included in the contract specification documents. e) Provision to be made for rehabilitation/ re-vegetation of areas damaged by construction activities.								
Previous with mitigation	Local 1	High 3	Short-term 1	Low 5	Probable	LOW	- ve	Medium
Current with mitigation	Local 1	High 3	Short-term 1	Low 5	Probable	LOW	- ve	Medium

Table 7a: Visual Impacts with mitigations (Phase 2): Wind turbines

	Extent	Intensity	Duration	Consequence	Probability	Significance	Status	Confidence
Previous without mitigation	Local 1	Very high 3	Long-term 3	High 7	Definite	HIGH	- ve	High
Current without mitigation	Local 1	High 3	Long-term 3	High 7	Definite	HIGH	- ve	High

Essential mitigation measures: (See Fig. 13).

- a) Visually sensitive peaks, major ridgelines and scarp edges, including 500m buffers, to be avoided, because of silhouette effect on the skyline. Peaks marked in yellow are important topographic features to be avoided in particular.
- b) Slopes steeper than 1:5 gradient to be avoided.
- c) Cultural landscapes or valuable cultivated land, particularly along alluvial river terraces to be avoided.
- d) Stream features, including 250m buffers, to be avoided.
- e) Buffers around settlements, farmsteads and roads to be observed.

Previous with mitigation	Local 1	Medium 2	Long-term 3	Medium 6	probable	MEDIUM	- ve	Medium
Current with mitigation	Local 1	Medium 2	Long-term 3	Medium 6	probable	MEDIUM	- ve	Medium

Table 7b: Visual Impacts with mitigations (Phase 2): Powerlines / Infrastructure

	Extent	Intensity	Duration	Consequence	Probability	Significance	Status	Confidence
Previous without mitigation	Local 1	Medium 2	Long-term 3	Medium 6	Definite	MEDIUM	- ve	High
Current without mitigation	Local 1	Medium 2	Long-term 3	Medium 6	Definite	MEDIUM	- ve	High

Essential mitigation measures:

- a) Powerlines to avoid Visually sensitive peaks, major ridgelines, scarp edges and slopes steeper than 1:5 gradient.
- b) Internal connecting powerlines to be below ground where possible, particularly on visually exposed ridges. (in areas of shallow bedrock, powerlines could be covered with overburden).
- c) Substations to be sited in unobtrusive, low-lying areas, away from roads and habitations, and screened by berms and/or tree-planting where feasible.
- d) Operations and maintenance buildings and parking areas to be located in an unobtrusive area and consolidated to avoid sprawl of buildings in the open landscape.
- e) Access roads to be in sympathy with the contours, avoid steep 1:5 slopes and drainage courses, and kept as narrow as possible.

Previous with mitigation	Local 1	Low 1	Long-term 3	Low 5	probable	LOW	- ve	Medium
Current with mitigation	Local 1	Low 1	Long-term 3	Low 5	probable	LOW	- ve	Medium

Table 7c: Visual Impacts with mitigations (Phase 2): Construction

	Extent	Intensity	Duration	Consequence	Probability	Significance	Status	Confidence
Previous without mitigation	Local 1	Very high 3	Short-term 1	Low 5	Probable	LOW	- ve	Medium
Current without mitigation	Local 1	High 3	Short-term 1	Low 5	Probable	LOW	- ve	Medium
Essential mitigation measures:								
a) Access and haul roads to use existing farm tracks as far as possible. b) Construction camp, stockpiles and lay-down area to be located out of sight of district roads, possibly in the vicinity of the proposed substation and O&M buildings. c) Disturbed areas rather than pristine or intact land to preferably be used for the construction camp. Construction camp and laydown areas to be limited in area to only that which is essential. d) Measures to control wastes and litter to be included in the contract specification documents. e) Provision to be made for rehabilitation/ re-vegetation of areas damaged by construction activities.								
Previous with mitigation	Local 1	High 3	Short-term 1	Low 5	probable	LOW	- ve	Medium
Current with mitigation	Local 1	High 3	Short-term 1	Low 5	probable	LOW	- ve	Medium

5 Findings and Conclusions

Current Version 'W', Phase 1 Layout:

The current proposed layout of the WEF is presumed to be the preferred layout, the assessment of which is summarised below.

Using the assessment methodology described above, it was determined that the visual impact significance of the Phase 1 WEF would be similar to the previous layout, i.e. high before mitigation, given the number of wind turbines (up to 35 turbines) and the large size of turbines.

The visual effect of the proposed WEF has been partly reduced through the elimination and relocation of many of the turbines. Buffers around topographic features, settlements and roads have been recommended and these mitigations have been implemented in the current layout, resulting in the potential visual impact significance being reduced to medium.

The proposed transmission line between the site and the planned Ishwati Emoyeni WEF is presently indicated in a straight 38km alignment. This could potentially have a high visual impact significance, but with mitigation could be reduced to medium significance if scenic resources and sensitive receptors are avoided. However, a more detailed alignment would need to be provided. Associated infrastructure, such as access roads, substation and maintenance buildings could also be mitigated and would have a similar medium significance rating.

The construction phase of the WEF and associated infrastructure would be short-term (<2 years) and would potentially have a low overall visual significance rating.

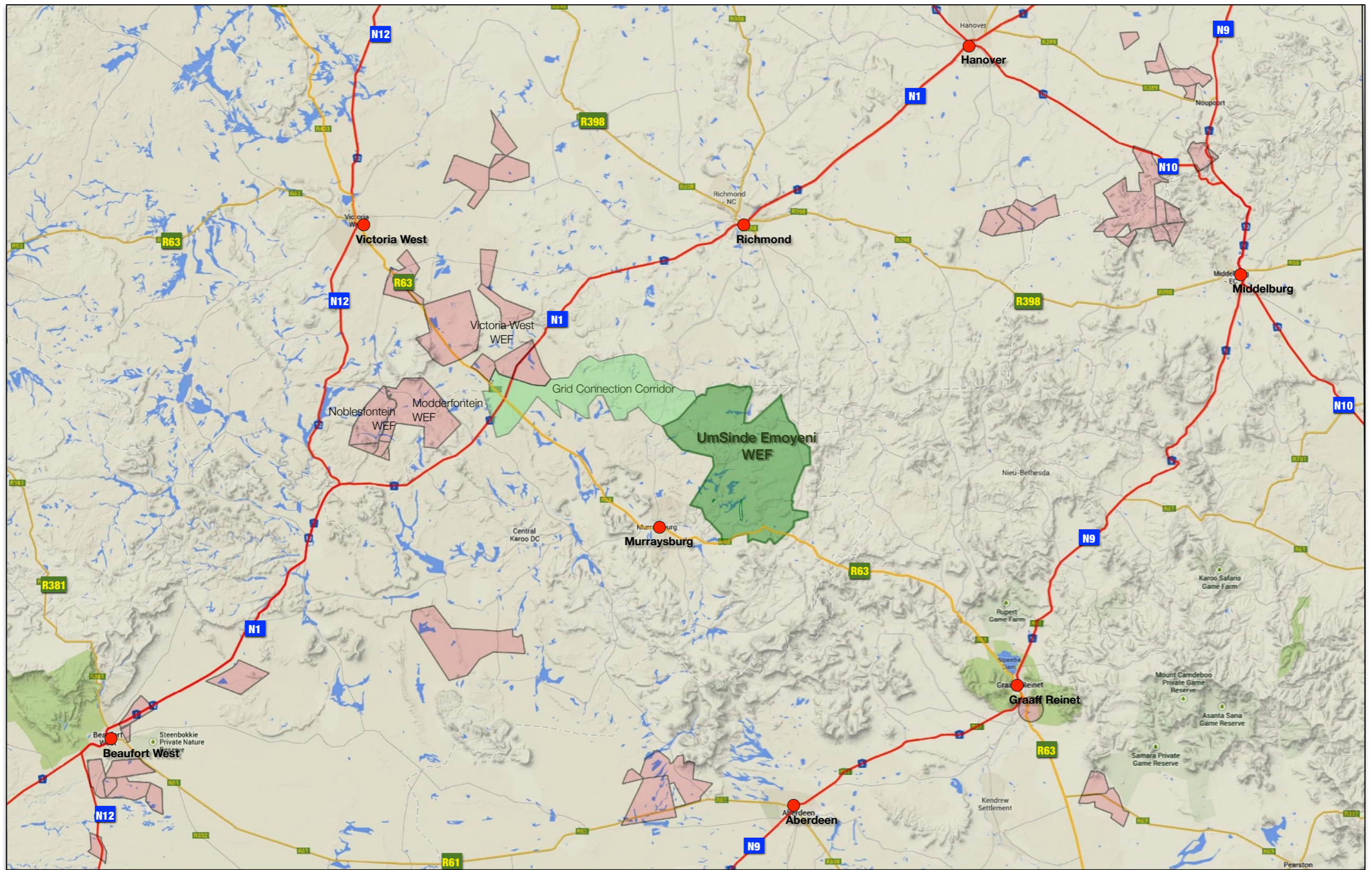
Current Version 'W', Phase 2 Layout:

The visual impact significance of Phase 2 would be high in intensity because of the location of the wind turbines, and because the proposed WEF would be visible from a range of viewpoints as can be seen in the photomontages, (Figures 10 to 13). The significance has been reduced from high to medium through similar mitigations to those in Phase 1, including the elimination of many of the previously proposed turbines and through micro-siting.

The branch transmission line from the substation to the Phase 1 transmission line is relatively short, and together with associated infrastructure, can be mitigated to result in a low visual impact significance. The proposed substation for Phase 2 is to be re-located further away from the district road. The construction phase for Phase 2 would have a low significance, being short-term.

In summary, there are now significantly fewer turbines (35) in each of the two phases than in the previous WEF proposals of 2015, the turbines have been moved further north, away from the Trouberg and sensitive receptors, distances from sensitive receptors have increased in many cases, and the viewshed is slightly less extensive, particularly towards the south. In addition, the fewer turbines would potentially result in slightly less visual clutter on the skyline, as well as fewer access roads and assembly platforms being required.

Therefore, the current layout is preferred for the reasons given above. It follows that the cumulative visual impact would also be slightly less for the current WEF proposals than for the previous 2015 proposals. Any approvals should be subject to the recommended visual mitigations.

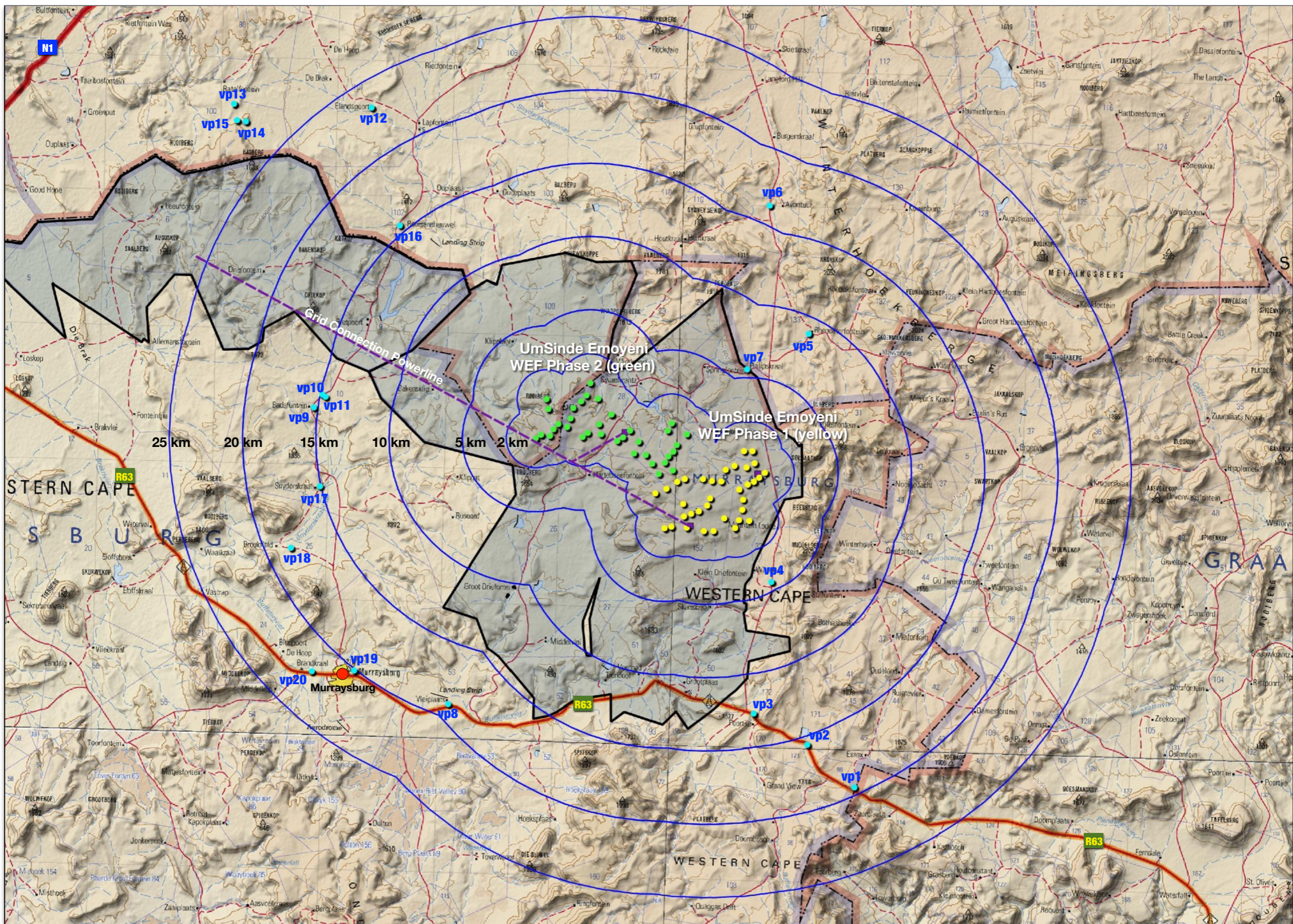


Base Map Source : Google Maps 2015

Figure 1 • Location Map

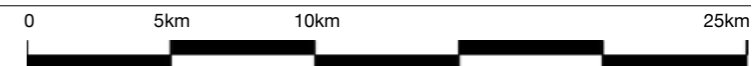
scale 1 : 1 000 000 (approx)

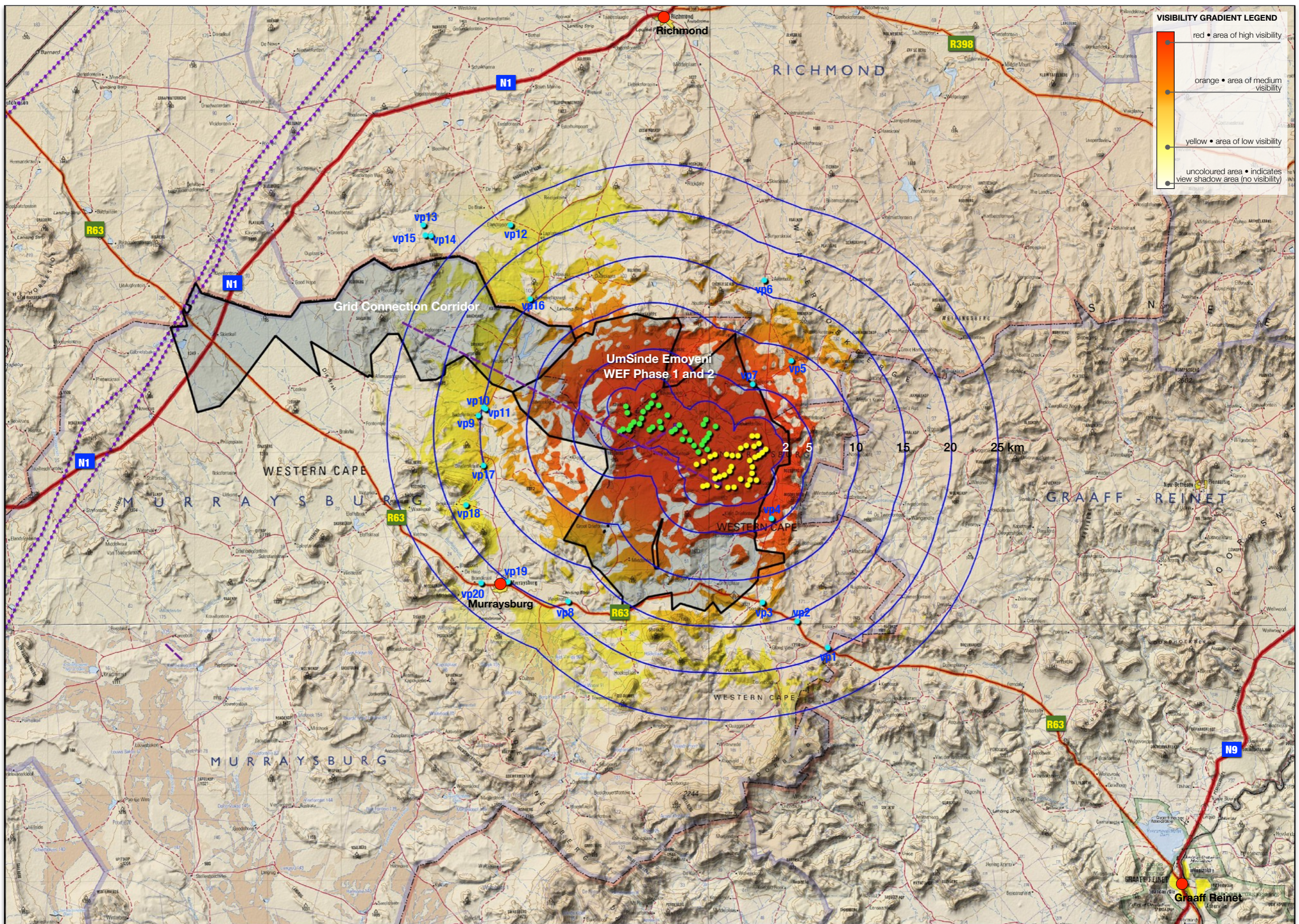




Base Map Source : Chief Directorate : National Geo-Spatial Information : 1:250 000 Topo-Cadastral Series : 3122 Victoria West (4) 2005, 3124 Middelburg (5) 2009, 3222 Beaufort West (5) 2005, 3224 Graaf Reinet (5) 2005

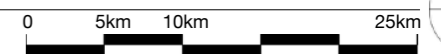
Figure 2 • WEF Rev W Phase 1 and 2 Layout, Viewpoints and Distance Radii

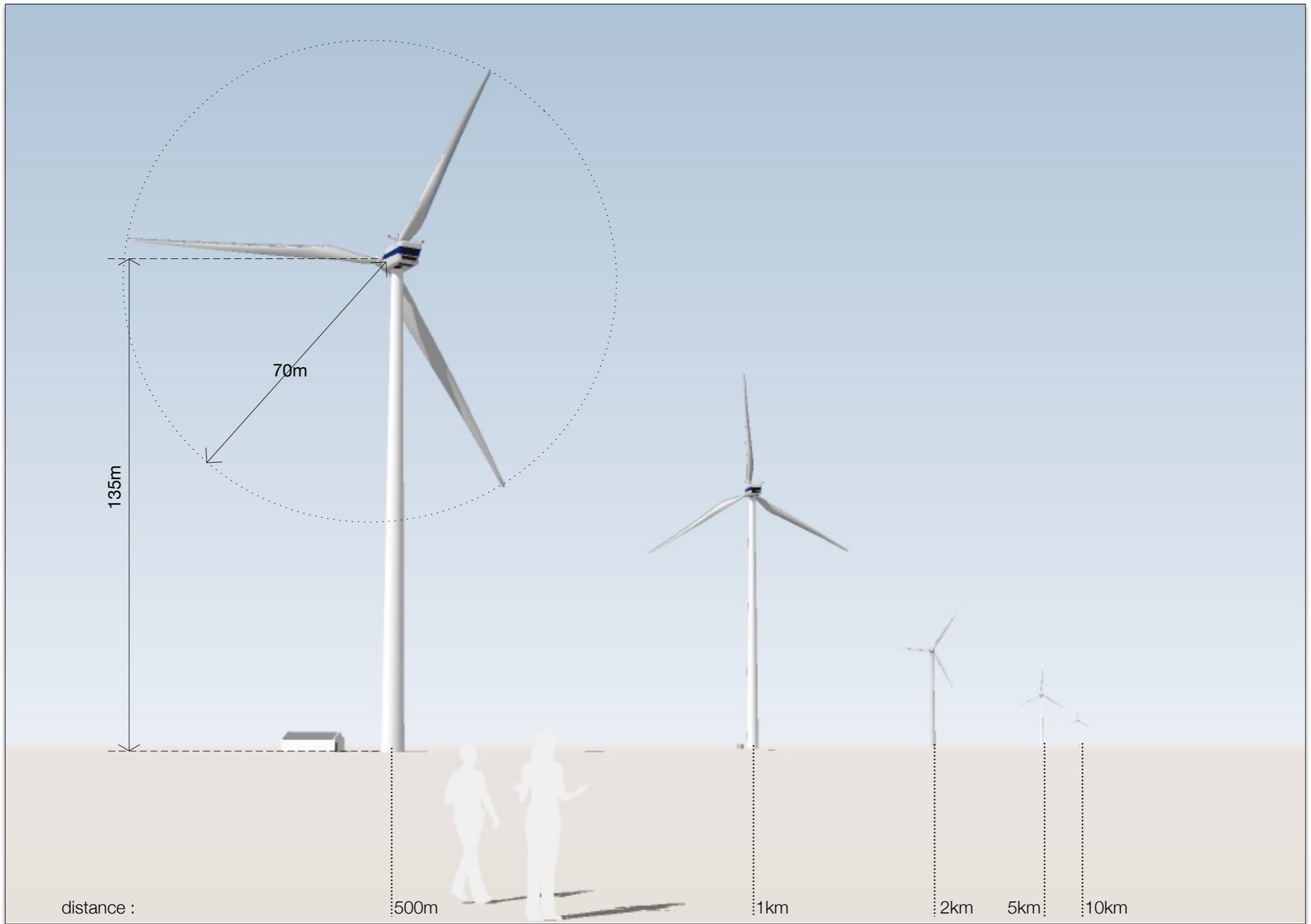




Base Map Source : Chief Directorate : National Geo-Spatial Information : 1:250 000 Topo-Cadastral Series : 3122 Victoria West (4) 2005, 3124 Middelburg (5) 2009, 3222 Beaufort West (5) 2005, 3224 Graaf Reinet (5) 2005

Figure 3 • WEF Rev W 2018 Phase 1 and 2 Viewshed

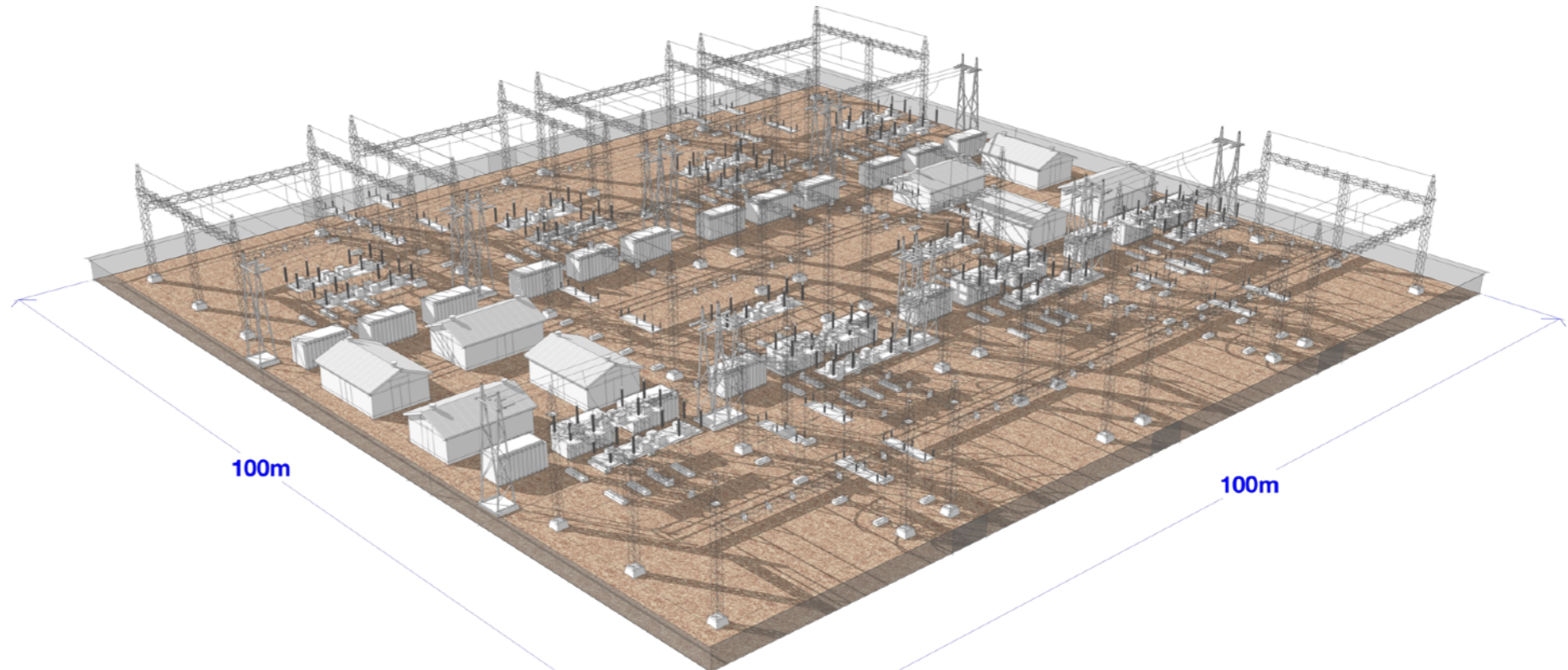




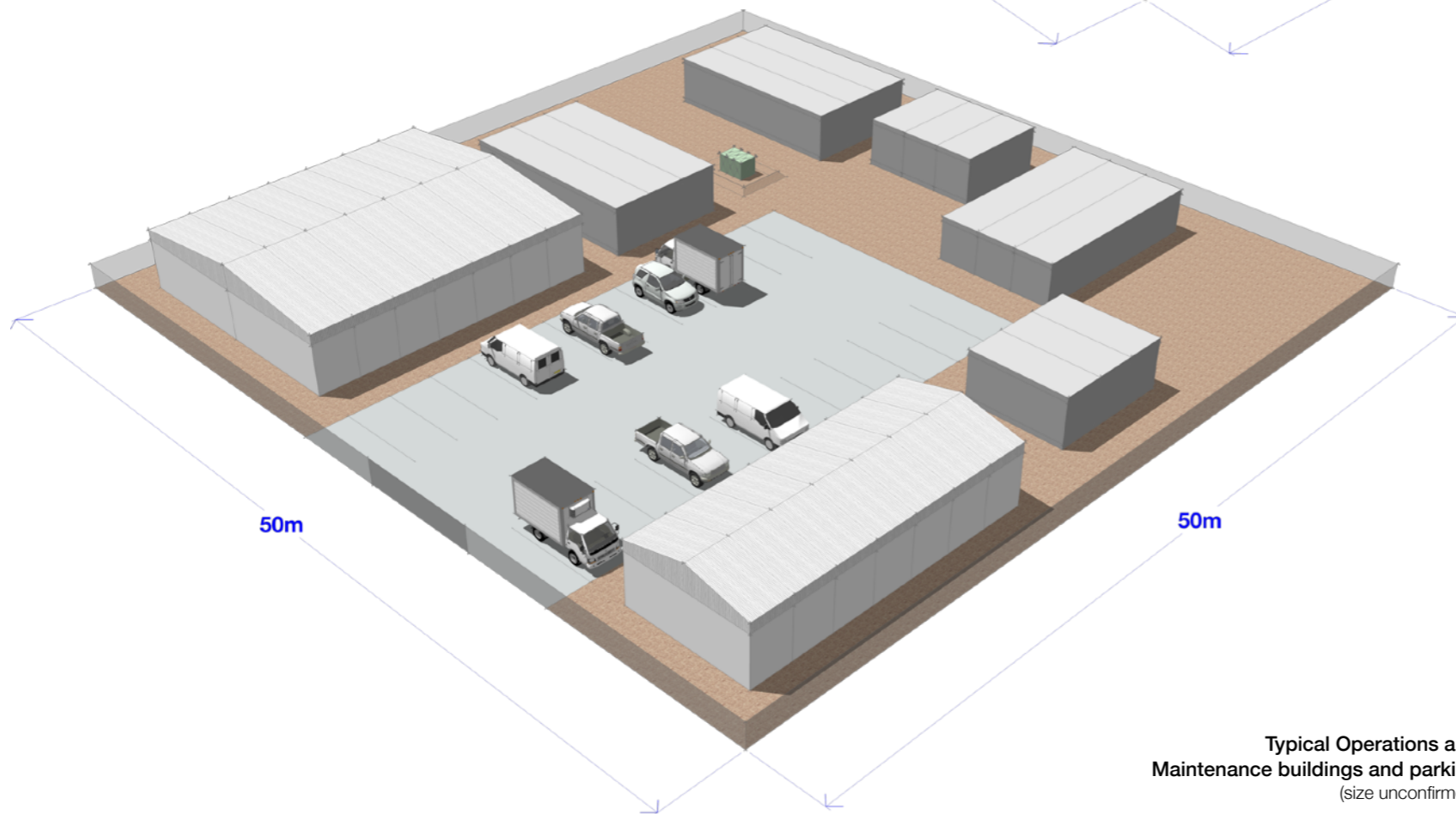
3D Model and projection by mlb/BOLA 2015

Figure 4 • Indicative Visibility of Wind Turbines at increasing distances

no scale

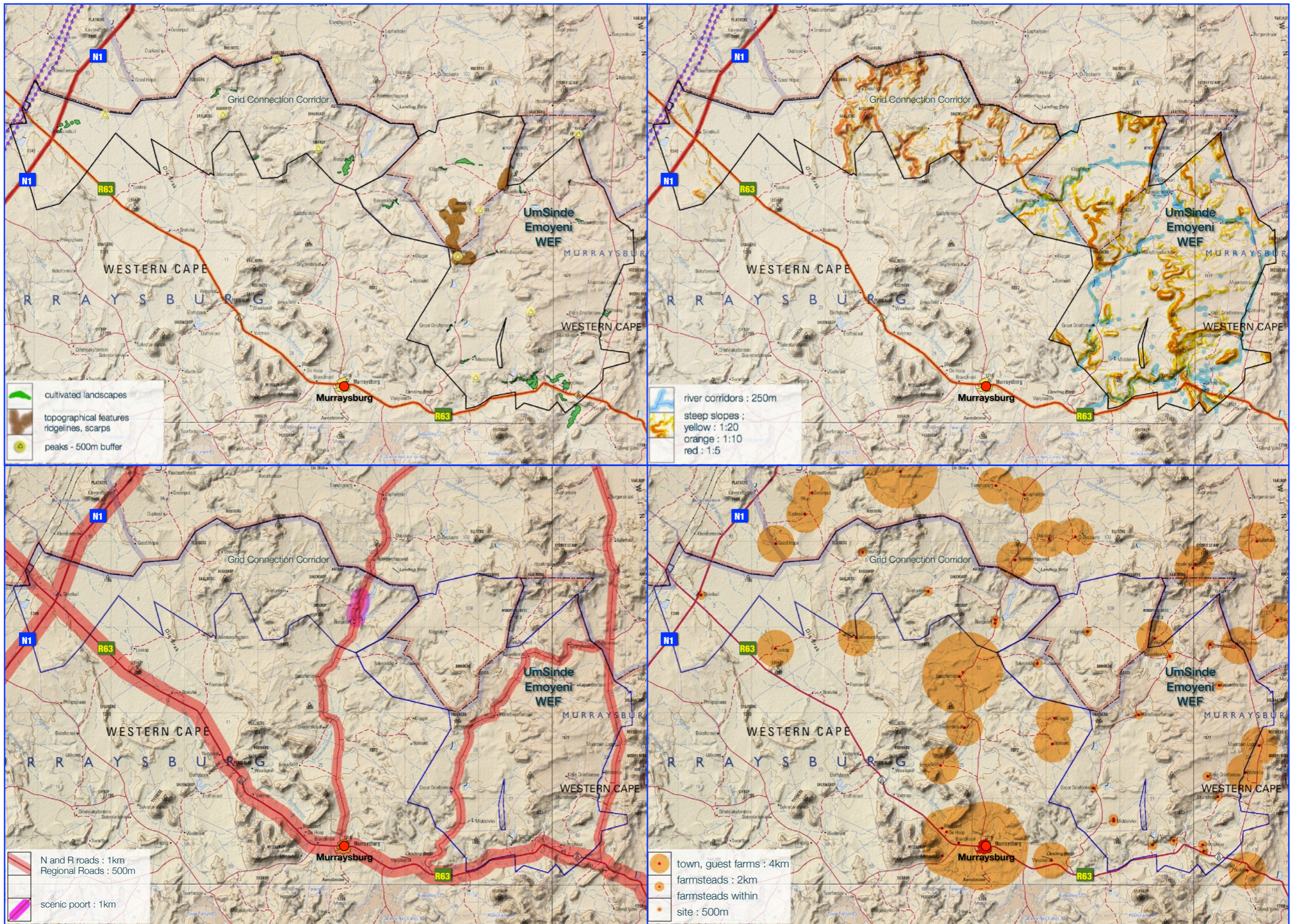


Typical sub-station layout
(size unconfirmed)



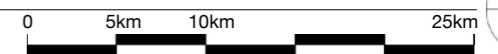
Typical Operations and
Maintenance buildings and parking
(size unconfirmed)

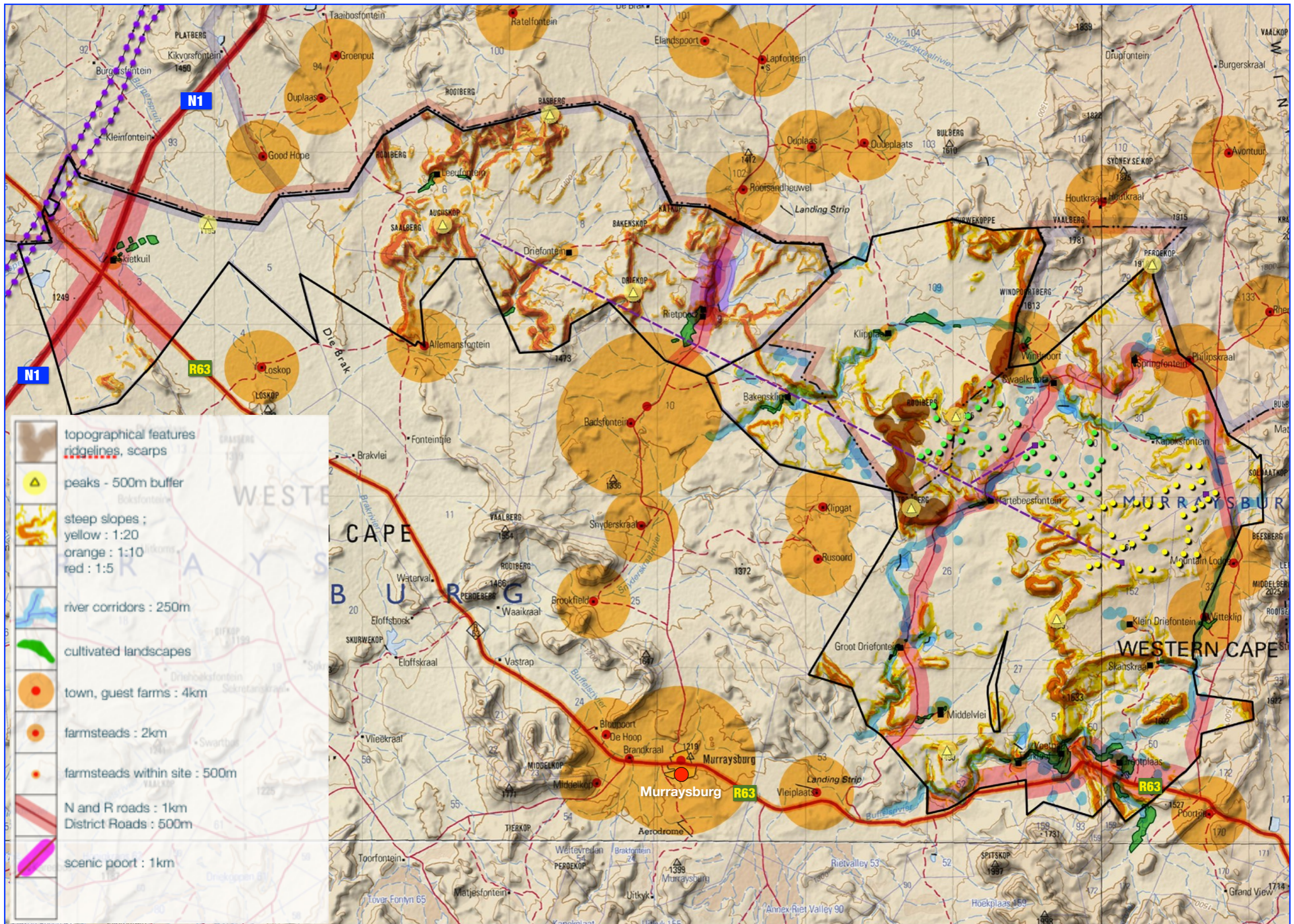
Figure 5 • Indicative 3D models of Facilities



Base Map Source : Chief Directorate : National Geo-Spatial Information : 1:250 000 Topo-Cadastral Series : 3122 Victoria West (4) 2005, 3124 Middelburg (5) 2009, 3222 Beaufort West (5) 2005, 3224 Graaf Reinet (5) 2005

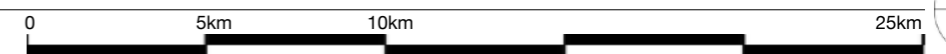
Figure 6 • Visual Informants Mapping





Base Map Source : Chief Directorate : National Geo-Spatial Information : 1:250 000 Topo-Cadastral Series : 3122 Victoria West (4) 2005, 3124 Middelburg (5) 2009, 3222 Beaufort West (5) 2005, 3224 Graaf Reinet (5) 2005

Figure 7 • Visual Informants Composite Map • WEF Rev W 2018 Phase 1 and 2





Phase 1 visibility

viewpoint 3 • R63 at Poortjie - looking north-west towards WEF site on skyline. Only Phase 1 WEF would be moderately visible but partly obscured by the foreground ridges.

31.9825S, 24.0600E 12.7km



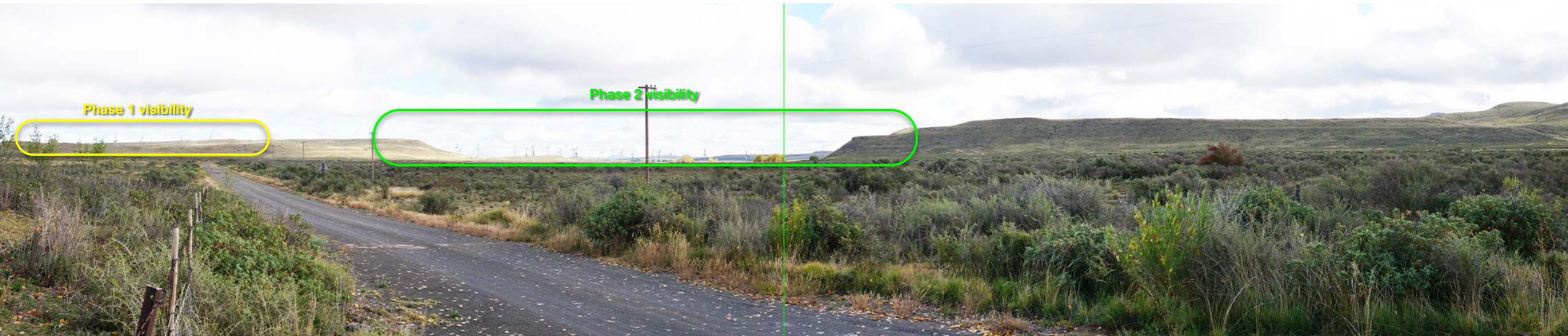
Soldaatkop

Phase 2 visibility

Phase 1 visibility

viewpoint 4 • regional road at Witteklip - looking west towards WEF site. Both Phase 1 and 2 WEF would be highly visible across the extent of this view.

31.9014S, 24.0702E 4.33km



Phase 1 visibility

Phase 2 visibility

viewpoint 5 • near Rhenosterfontein farmstead - looking south-west towards WEF site. Both Phase 1 and 2 WEF would be moderately visible but partly obscured by foreground ridges.

31.7482S, 24.0921E 8.87km

Figure 10 • Viewpoint Photomontages



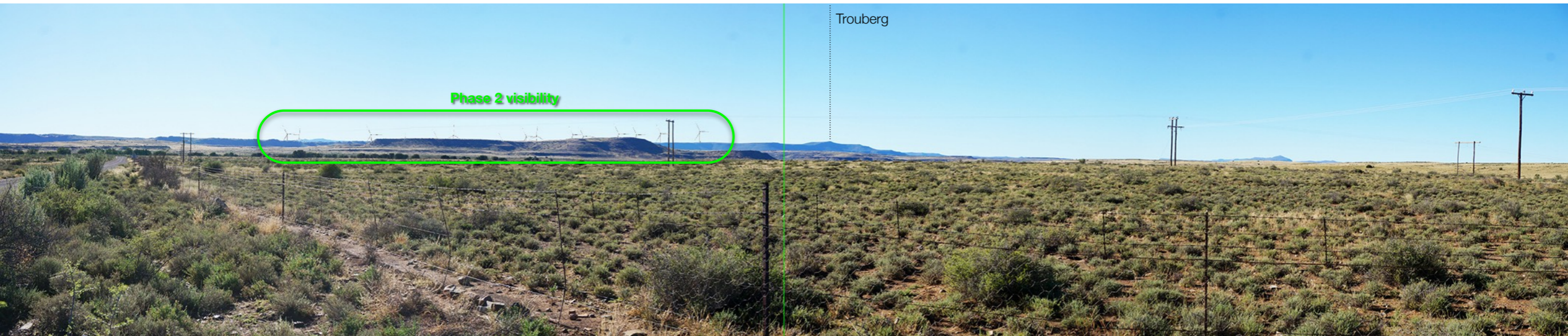
viewpoint 7 • Phillipskraal - looking south-west on boundary of WEF site. Both Phase 1 and 2 WEF would be highly visible in the foreground.

31.7712S, 24.0484E 5.54km



viewpoint 9 • Badsfontein Gate - looking east-south-east towards WEF site. Only Phase 2 WEF would be marginally visible but partly obscured by ridges and trees in the left foreground.

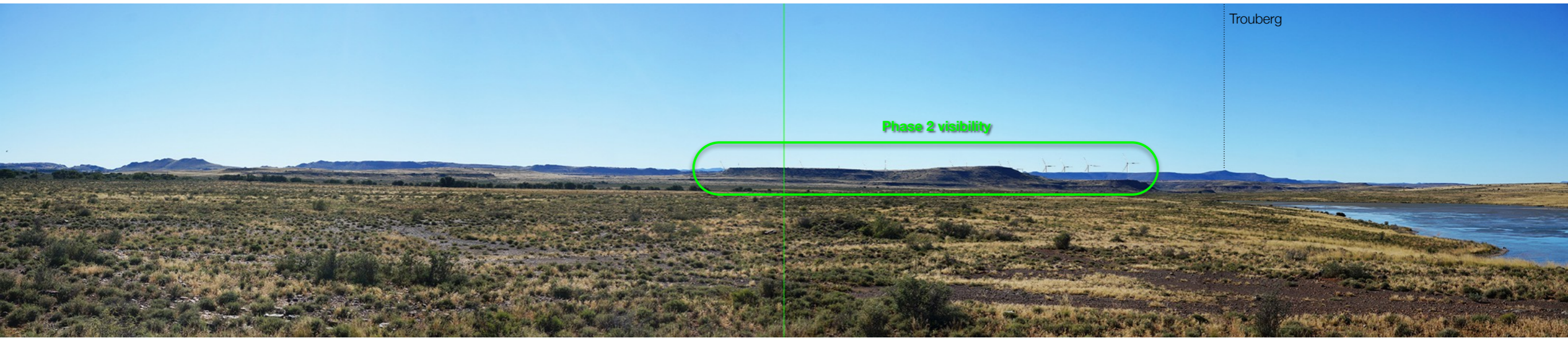
31.8016S, 23.7373E 15.19km



viewpoint 10 • Badsfontein Opstal - looking east towards WEF site. Only Phase 2 WEF would be marginally visible in the middle distance.

31.7935S, 23.7433E 14.76km

Figure 11 • Viewpoint Photomontages



viewpoint 11 • Badsfontein Dam - looking east towards WEF site. Only Phase 2 WEF would be marginally visible in the middle distance.

31.7949S, 23.7455E 14.52km



viewpoint 14 • Ratelfontein East - looking south-east towards WEF site 19.3km away. Both Phase 1 and 2 WEF would be marginally visible in the distance.

31.6269S, 23.6833E 27.88km



viewpoint 15 • Ratelfontein Saddle - looking south-east towards WEF site 19.9km away. The WEF would be marginally visible in the distance.

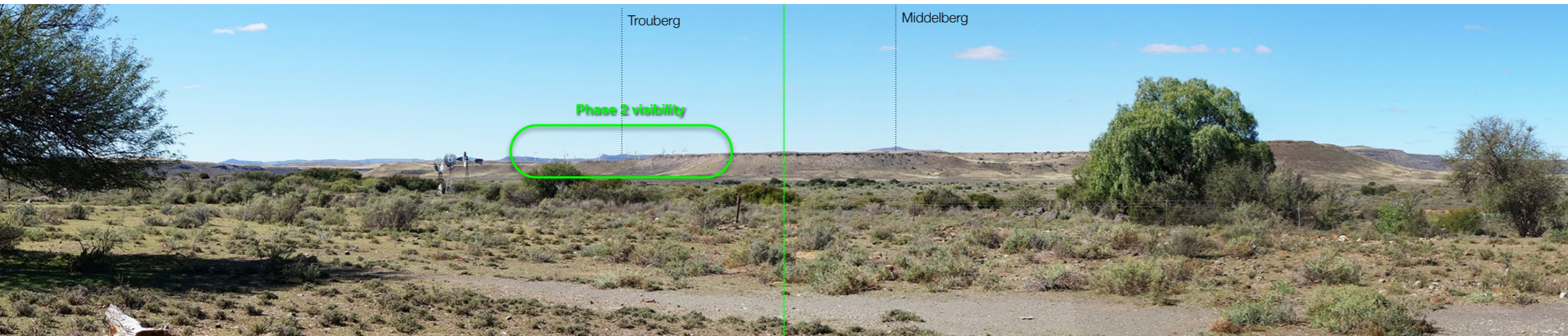
31.6262S, 23.6769E 28.43km

Figure 12 • Viewpoint Photomontages



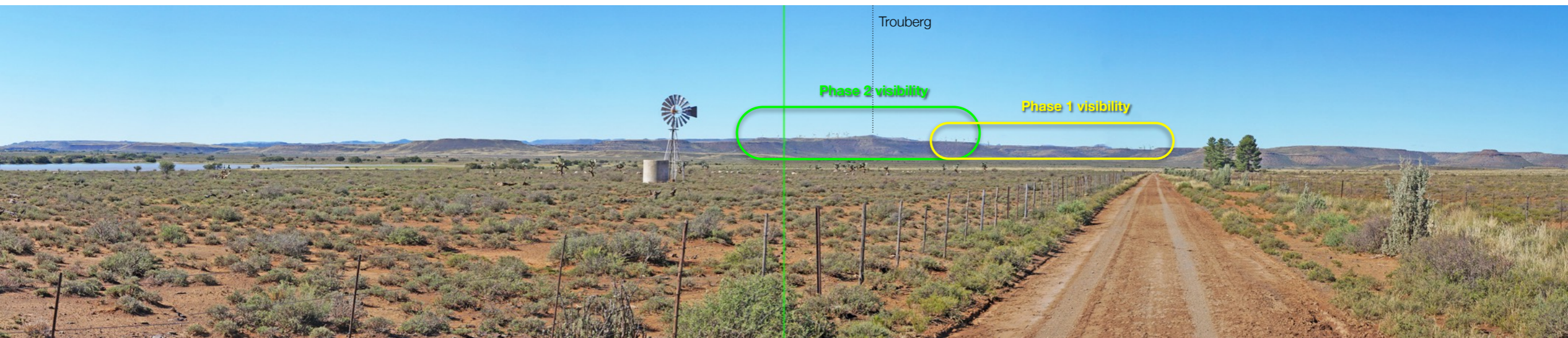
viewpoint 16 • Rooisandheuwel Farmstead- looking south-east towards WEF site. Only Phase 2 WEF would be marginally visible on the skyline, but mostly obscured by foreground ridges.

31.6885S, 23.7959E 15.48km



viewpoint 17 • Snyderskraal Farmstead - looking east towards WEF site. Only Phase 2 WEF would be marginally visible on the skyline ridges.

31.8500S, 23.7432E 14.94km



viewpoint 18 • Brookfield farm road - looking east towards WEF site. Both Phase 1 and 2 WEF would be marginally visible on the skyline ridges.

31.8882S, 23.7233E 18.14km

Figure 13 • Viewpoint Photomontages