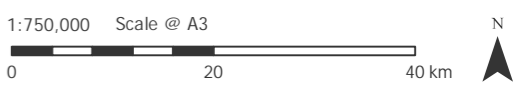


- Grid Site
- WEF Site
- Gamma Substation
- Local Municipality
- District Boundary
- Eastern Cape
- Western Cape
- Northern Cape

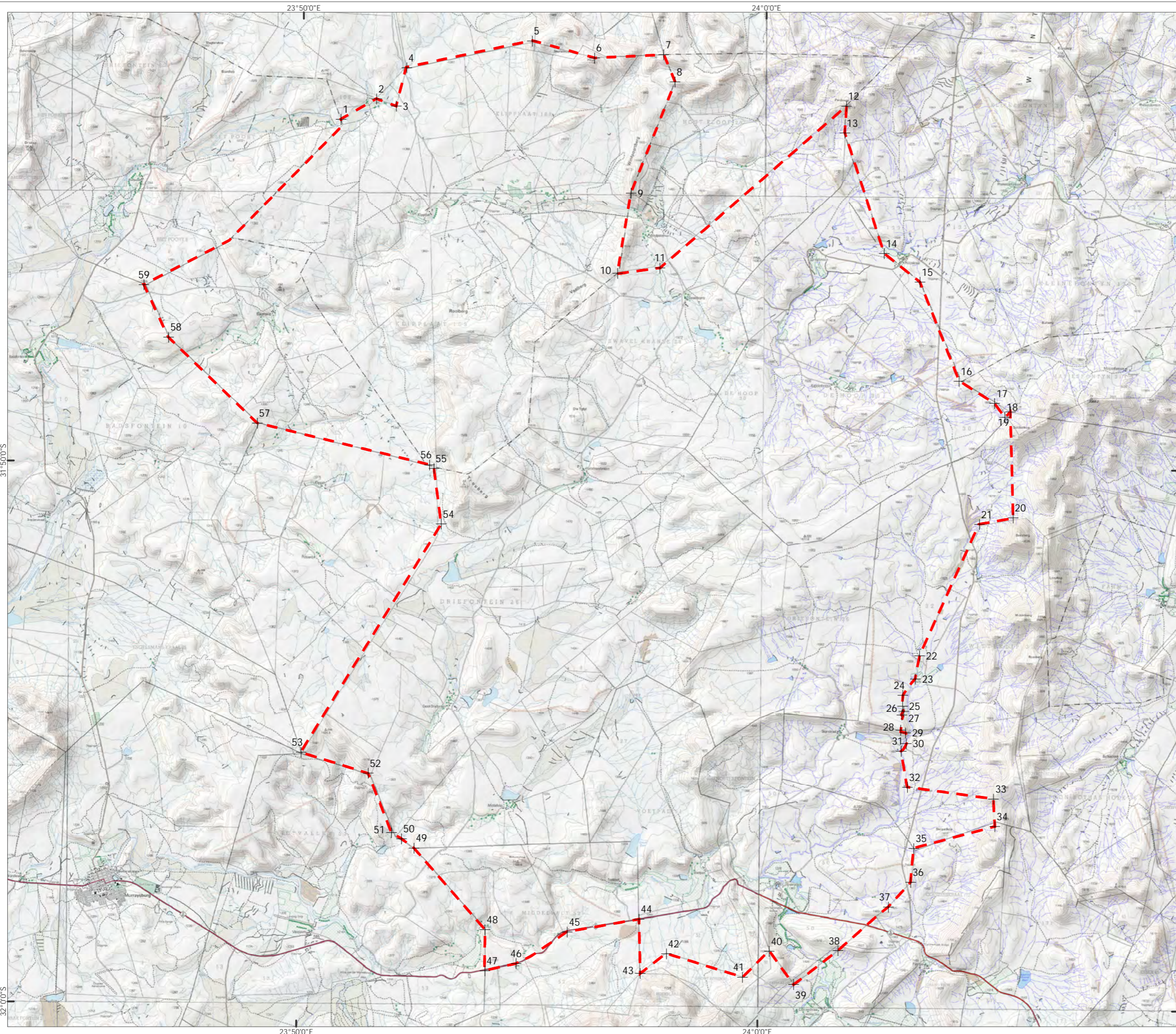


Projection: Transverse Mercator  
 Datum: Hartbeeshoek 94  
 Reference Ellipsoid: WGS 84  
 Central Meridian: 23°



Produced: JA	Ref: 2146/REP/034
Reviewed: SC	Date: 29/03/2016
Approved: AB	

Site Location  
Figure 1.1



--- WEF Site Boundary

ID	Longitude	Latitude	ID	Longitude	Latitude
1	-31.7274	23.8470	41	-31.9908	23.9944
2	-31.7210	23.8597	42	-31.9838	23.9668
3	-31.7232	23.8668	43	-31.9899	23.9575
4	-31.7113	23.8705	44	-31.9732	23.9569
5	-31.7028	23.9156	45	-31.9773	23.9309
6	-31.7078	23.9381	46	-31.9872	23.9125
7	-31.7067	23.9630	47	-31.9895	23.9013
8	-31.7150	23.9672	48	-31.9768	23.9012
9	-31.7495	23.9517	49	-31.9519	23.8754
10	-31.7742	23.9471	50	-31.9490	23.8708
11	-31.7724	23.9623	51	-31.9471	23.8672
12	-31.7221	24.0290	52	-31.9289	23.8586
13	-31.7303	24.0286	53	-31.9226	23.8343
14	-31.7674	24.0432	54	-31.8519	23.8843
15	-31.7760	24.0562	55	-31.8348	23.8814
16	-31.8065	24.0706	56	-31.8337	23.8799
17	-31.8132	24.0835	57	-31.8212	23.8176
18	-31.8174	24.0873	58	-31.7950	23.7854
19	-31.8158	24.0893	59	-31.7789	23.7763
20	-31.8484	24.0906			
21	-31.8505	24.0785			
22	-31.8912	24.0573			
23	-31.8984	24.0559			
24	-31.9034	24.0514			
25	-31.9068	24.0513			
26	-31.9083	24.0518			
27	-31.9095	24.0511			
28	-31.9142	24.0508			
29	-31.9150	24.0525			
30	-31.9183	24.0528			
31	-31.9207	24.0510			
32	-31.9318	24.0534			
33	-31.9352	24.0845			
34	-31.9436	24.0851			
35	-31.9506	24.0559			
36	-31.9611	24.0549			
37	-31.9687	24.0469			
38	-31.9823	24.0288			
39	-31.9929	24.0129			
40	-31.9827	24.0040			



1:125,000 Scale @ A3



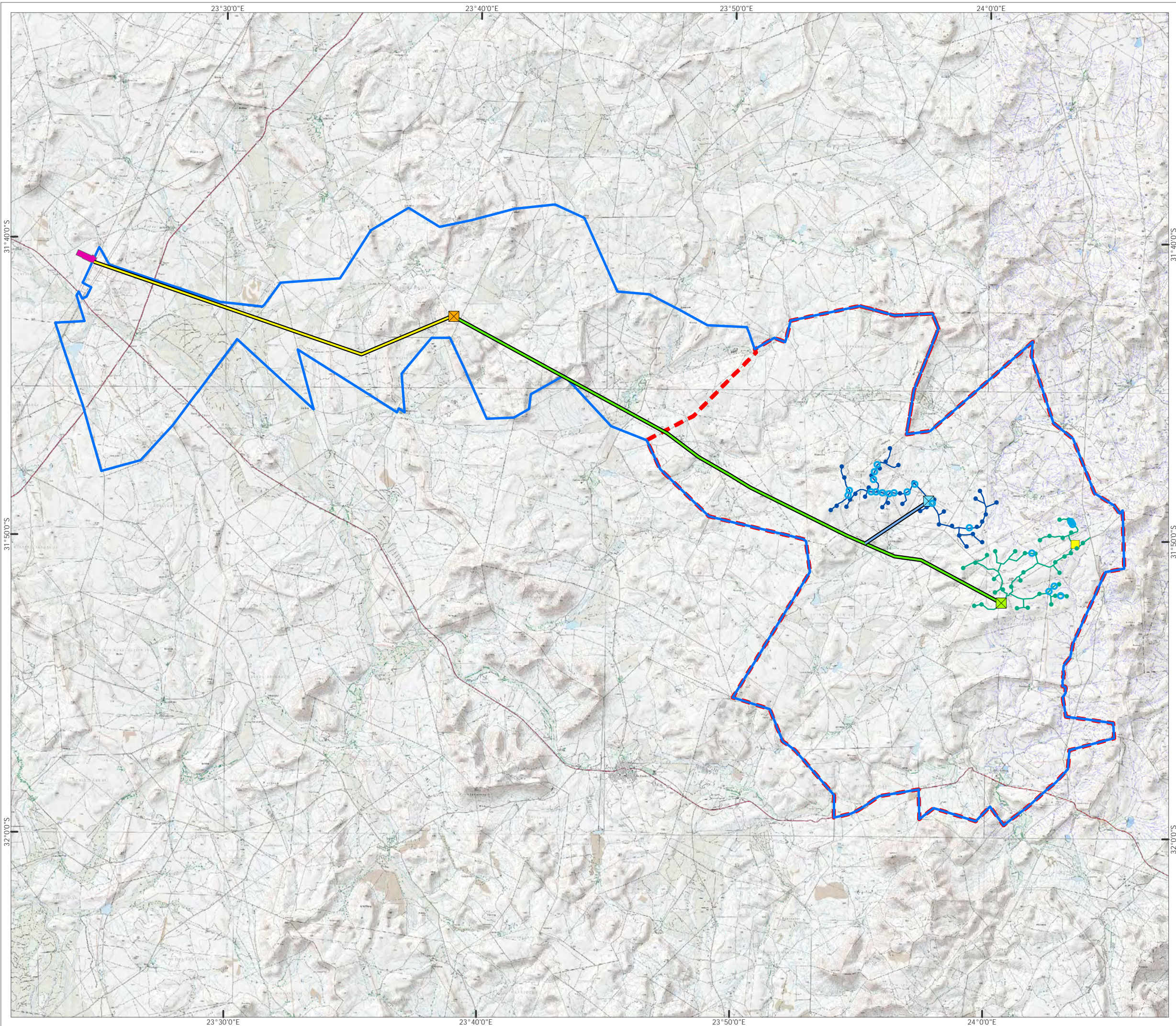
N

Produced: JA  
Reviewed: SC  
Approved: AB

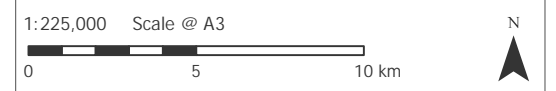
Ref: 2146/REP/035  
Date: 29/03/2016

WEF Site Boundary  
Phase 1 and 2  
Figure 1.2

Umsinde Emoyeni WEF Phase 1  
Final EIA Report

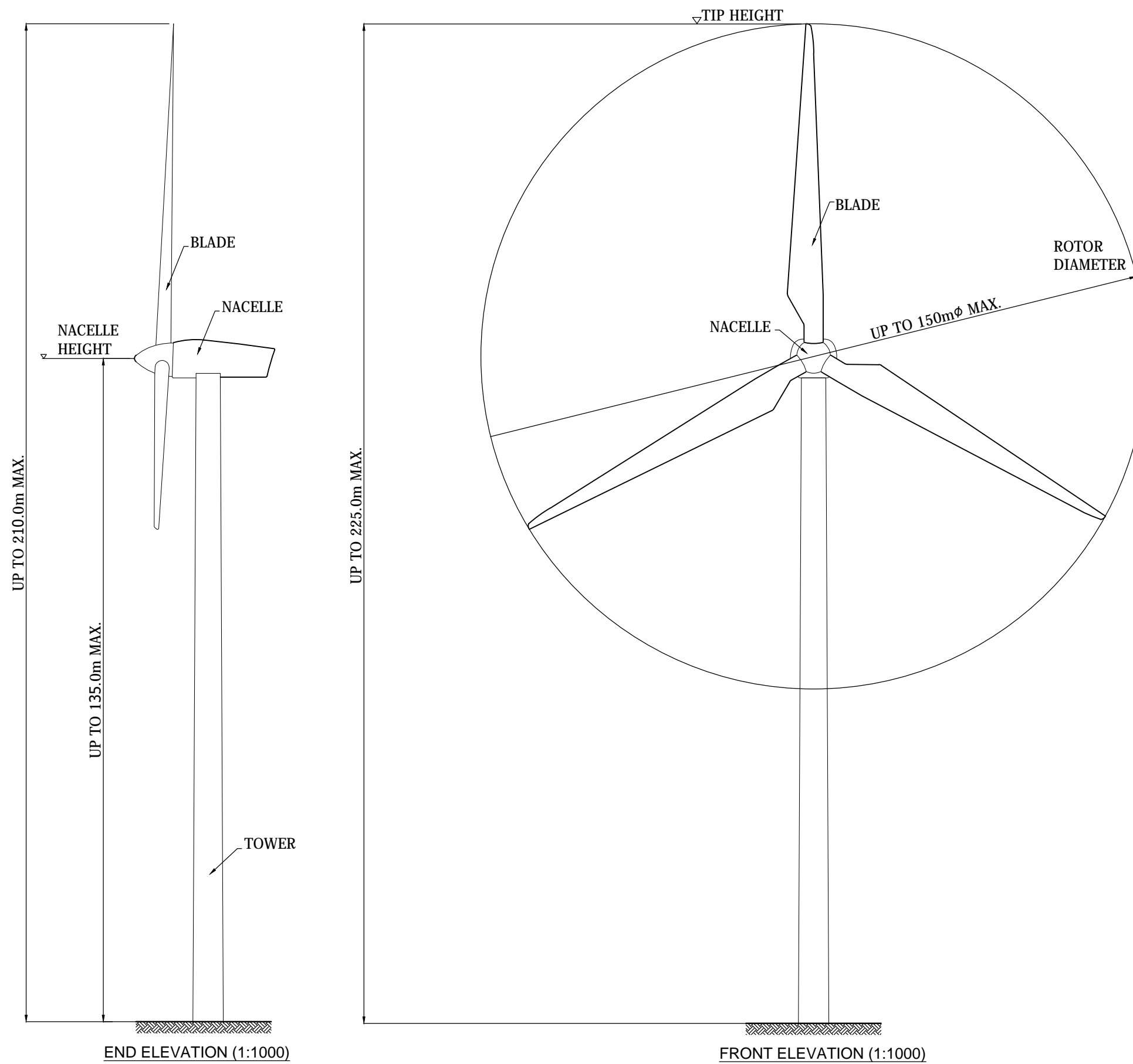


- WEF Site Boundary
- Grid Site Boundary
- Phase 1 Turbine Position
- Phase 1 Laydown yard
- Proposed Substation Phase 1
- Phase 2 Turbine Position
- Proposed Substation and Laydown Yard Phase 2
- Proposed Road Phase 1
- Proposed Road Phase 2
- Watercrossing
- Phase 1 Preferred Grid Route
- Phase 2 Preferred Grid Route
- Approved Ishwati Emoyeni Grid Route
- Approved Ishwati Emoyeni Substation
- Eskom Gamma Substation



Produced: JA	Ref: 2146/REP/036
Reviewed: SC	Date: 07/02/2018
Approved: AB	

The Proposed Development Layout  
Figure 1.3



NOTES:

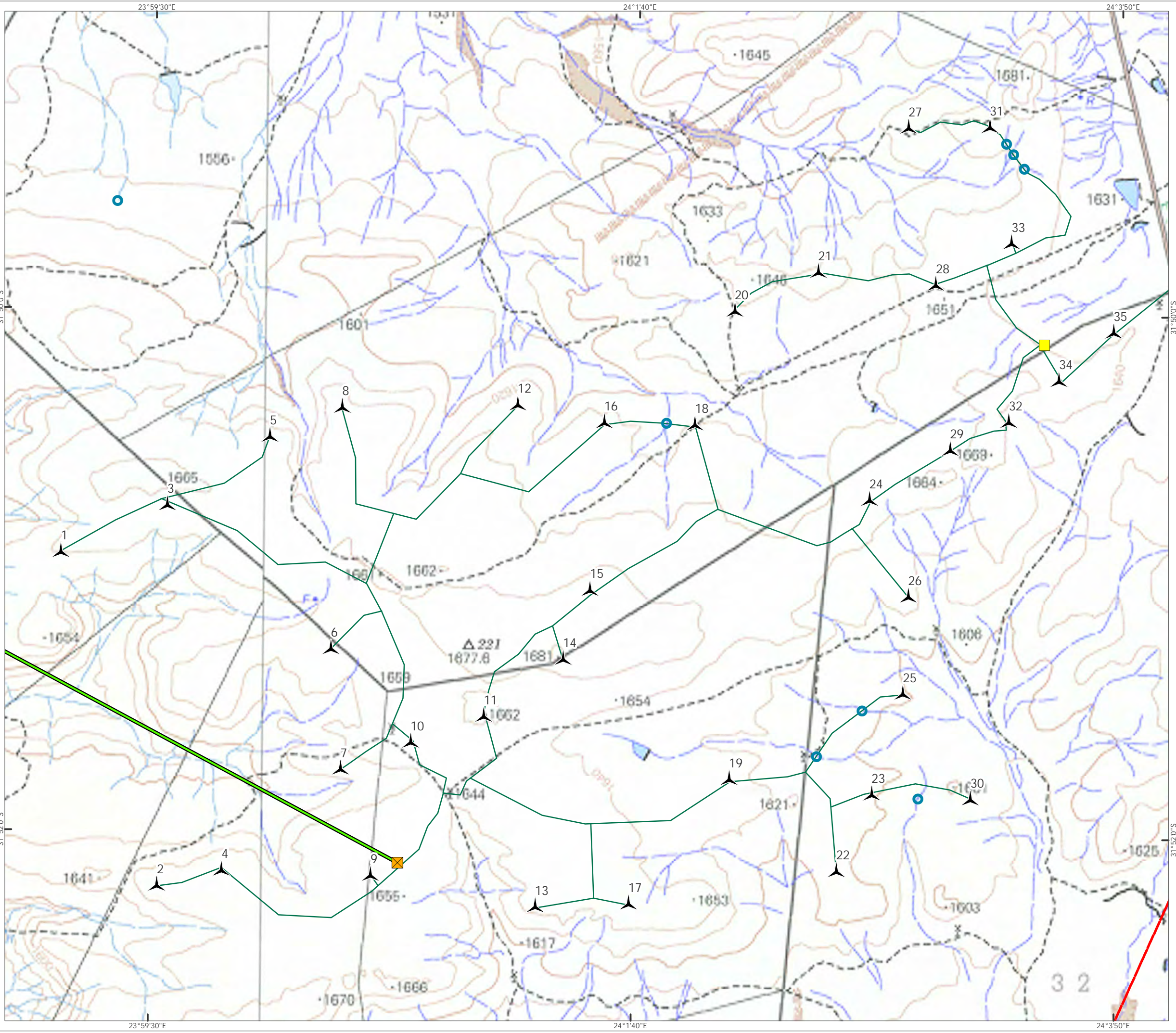
1. Figure for illustrative purposes only.
2. Depending on the final selected turbine, the transformer will either be housed in a small kiosk beside the turbine, or within the tower or nacelle.

Hub Height: 150m max.

Blade Length: 75m max.

Produced By: DB	Ref: 2244/REP/050	Rev: -
Reviewed By: SC	Date: 17/01/18	
Approved By: AA	Scale: AS SHOWN @ A3	

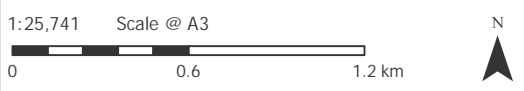
Maximum Turbine Dimensions  
Figure 1.4



- WEF Site Boundary
- Proposed Substation Phase 1
- Phase 1 Turbine Position
- Phase 1 Preferred Grid Route
- Phase 1 Laydown yard
- Proposed Road Phase 1
- Watercrossing

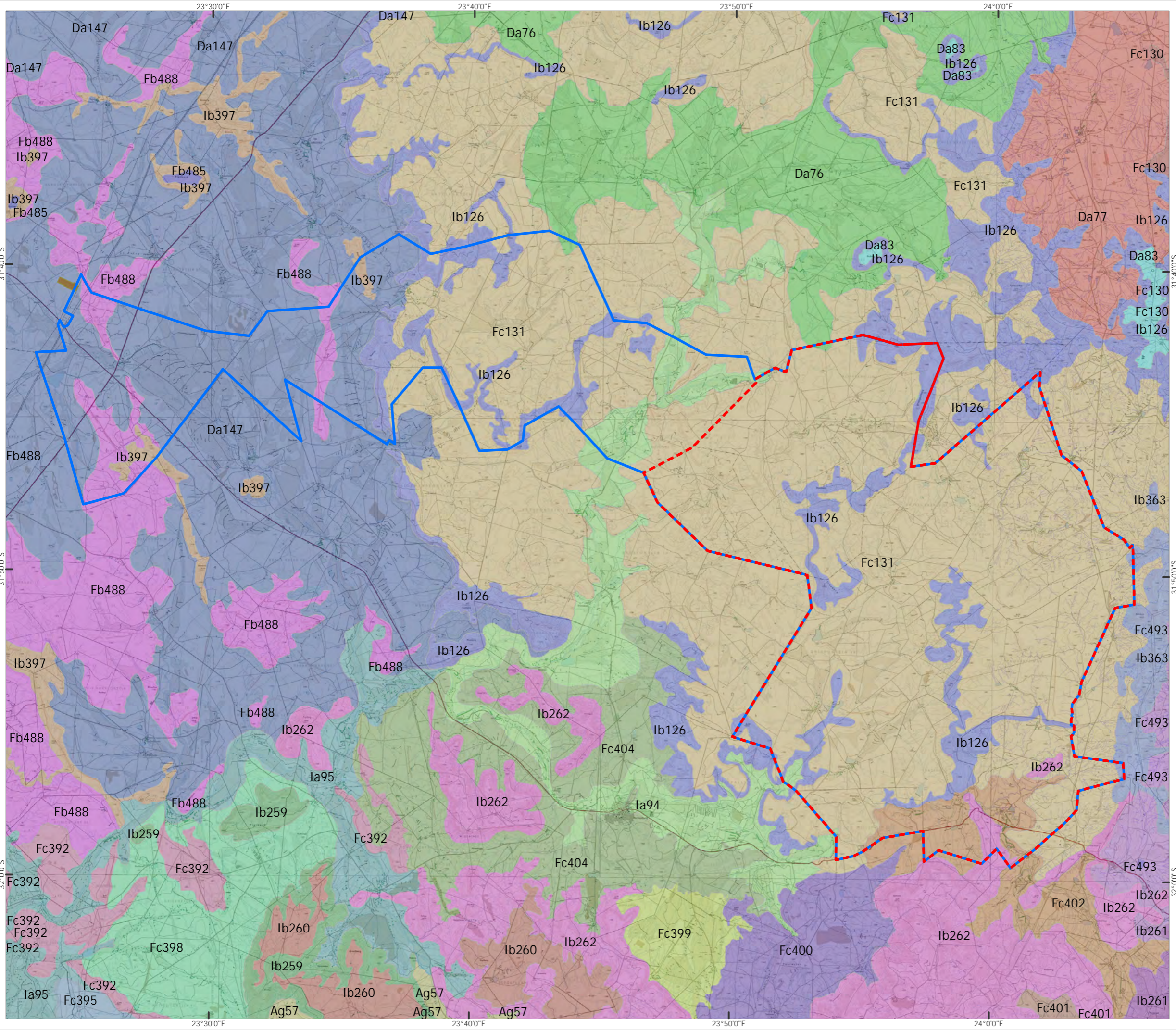


Projection: Transverse Mercator  
 Datum: Hartbeeshoek 94  
 Reference Ellipsoid: WGS 84  
 Central Meridian: 23°

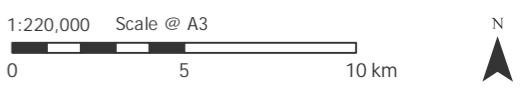


Produced: JA	Ref: 2146/REP/038
Reviewed: SC	Date: 07/02/2018
Approved: AB	

The Proposed Project Layout  
 35 Turbines  
 Figure 7.1



- WEF Site Boundary
  - Grid Site Boundary
- LANDTYPE
- Ag57
  - Da147
  - Da76
  - Da77
  - Da83
  - Fb485
  - Fb488
  - Fc130
  - Fc131
  - Fc392
  - Fc395
  - Fc398
  - Fc399
  - Fc400
  - Fc401
  - Fc402
  - Fc404
  - Fc493
  - Ia94
  - Ia95
  - Ib126
  - Ib259
  - Ib260
  - Ib261
  - Ib262
  - Ib363
  - Ib397



Produced: JA	Ref: 2146/REP/039
Reviewed: SC	Date: 29/03/2016
Approved: AB	

Land Types  
Figure 8.1

Umsinde Emoyeni WEF Phase 1  
Final EIA Report



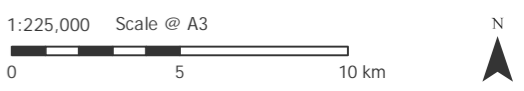
Basemapping from Chief-Directorate: National Geo-Spatial Information of South Africa



- WEF Site Boundary
- Grid Site Boundary
- NFEPA River
- Eastern Lower Karoo
- Eastern Upper Karoo
- Gamka Karoo
- Karoo Escarpment Grassland
- Southern Karoo Riviere
- Upper Karoo Hardeveld

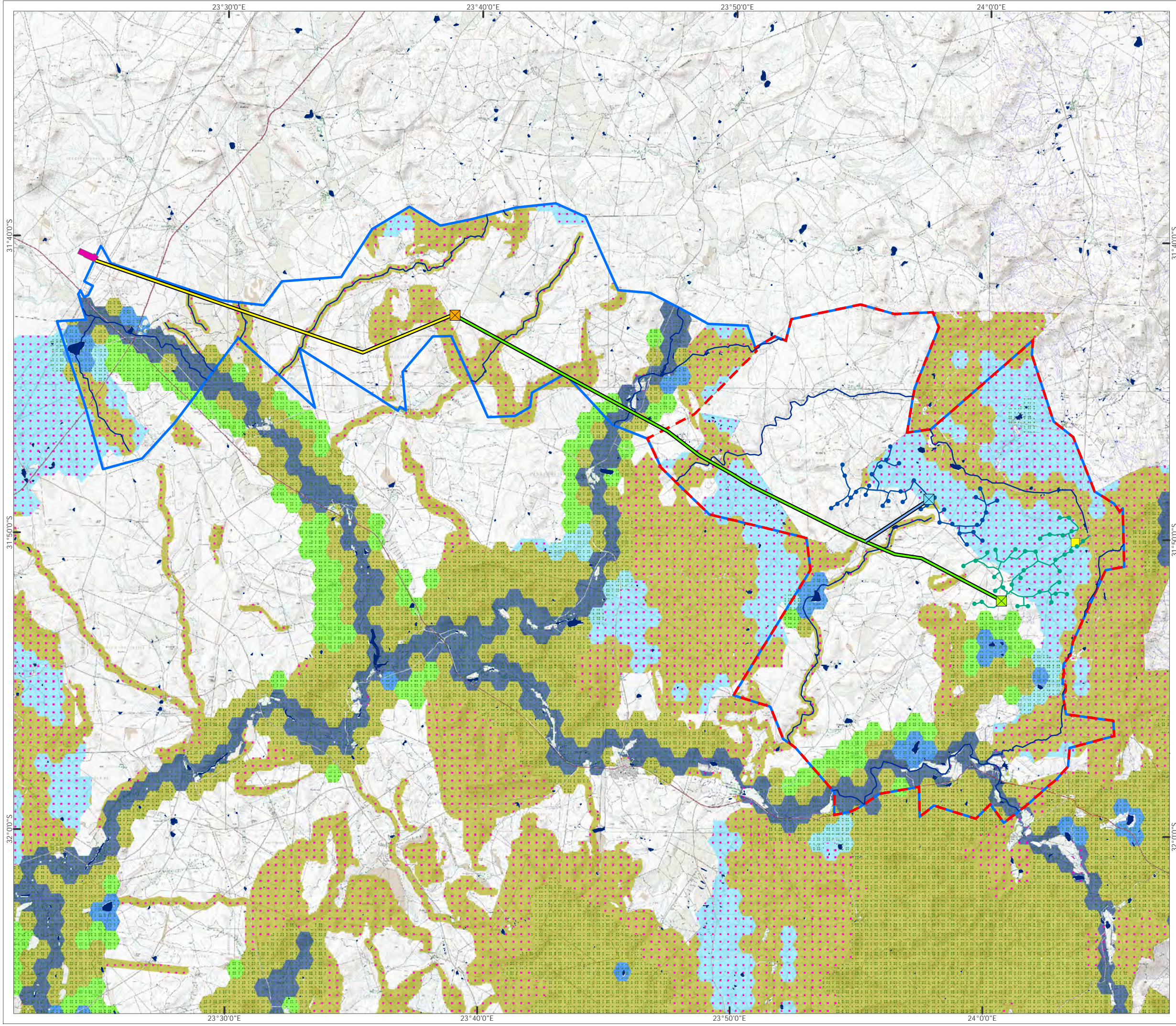


Projection: Transverse Mercator  
 Datum: Hartebeeshoek 94  
 Reference Ellipsoid: WGS 84  
 Central Meridian: 23°



Produced: JA	Ref: 2146/REP/040
Reviewed: SC	Date: 29/03/2016
Approved: AB	

Vegetation Map  
Figure 8.2



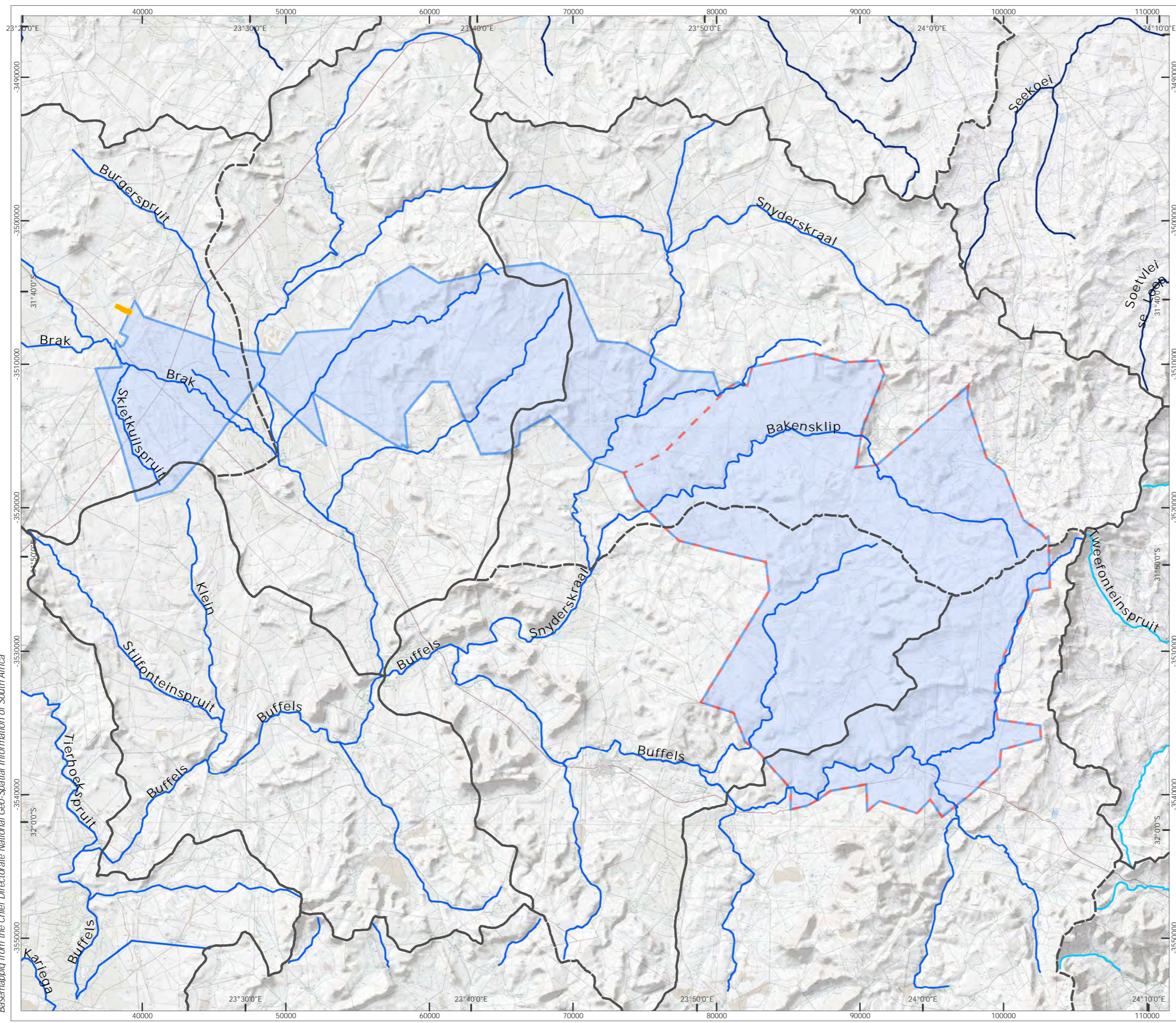
- WEF Site Boundary
- Grid Site Boundary
- Phase 1 Turbine Position
- Proposed Substation Phase 1
- Phase 1 Laydown yard
- Phase 2 Turbine Position
- Proposed Road Phase 1
- Approved Ishwati Emoyeni Substation
- Proposed Substation and Laydown Yard Phase 2
- Proposed Road Phase 2
- Phase 1 Preferred Grid Route
- Phase 2 Preferred Grid Route
- Approved Ishwati Emoyeni Grid Route
- Eskom Gamma Substation
- NFEPA Wetland
- NFEPA Rivers
- Critical Biodiversity Area
- Ecological Support Area
- Priority River Reach
- Priority Catchment
- Potential Wetland
- Maintain ecological processes
- Habitat Required as part of Best Design

1:225,000 Scale @ A3  
 0 5 10 km N

Produced: JA	Ref: 2146/REP/006
Reviewed: SC	Date: 05/02/2018
Approved: AB	

Critical Biodiversity Areas  
Figure 8.3

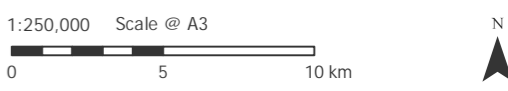




- WEF Site Boundary
- Grid Site Boundary
- Gamma Substation
- Quaternary Catchments
- PES Scores of NFEPA Rivers**
- Class B: Largely Natural
- Class C: Moderately Modified
- Class D: Largely Modified

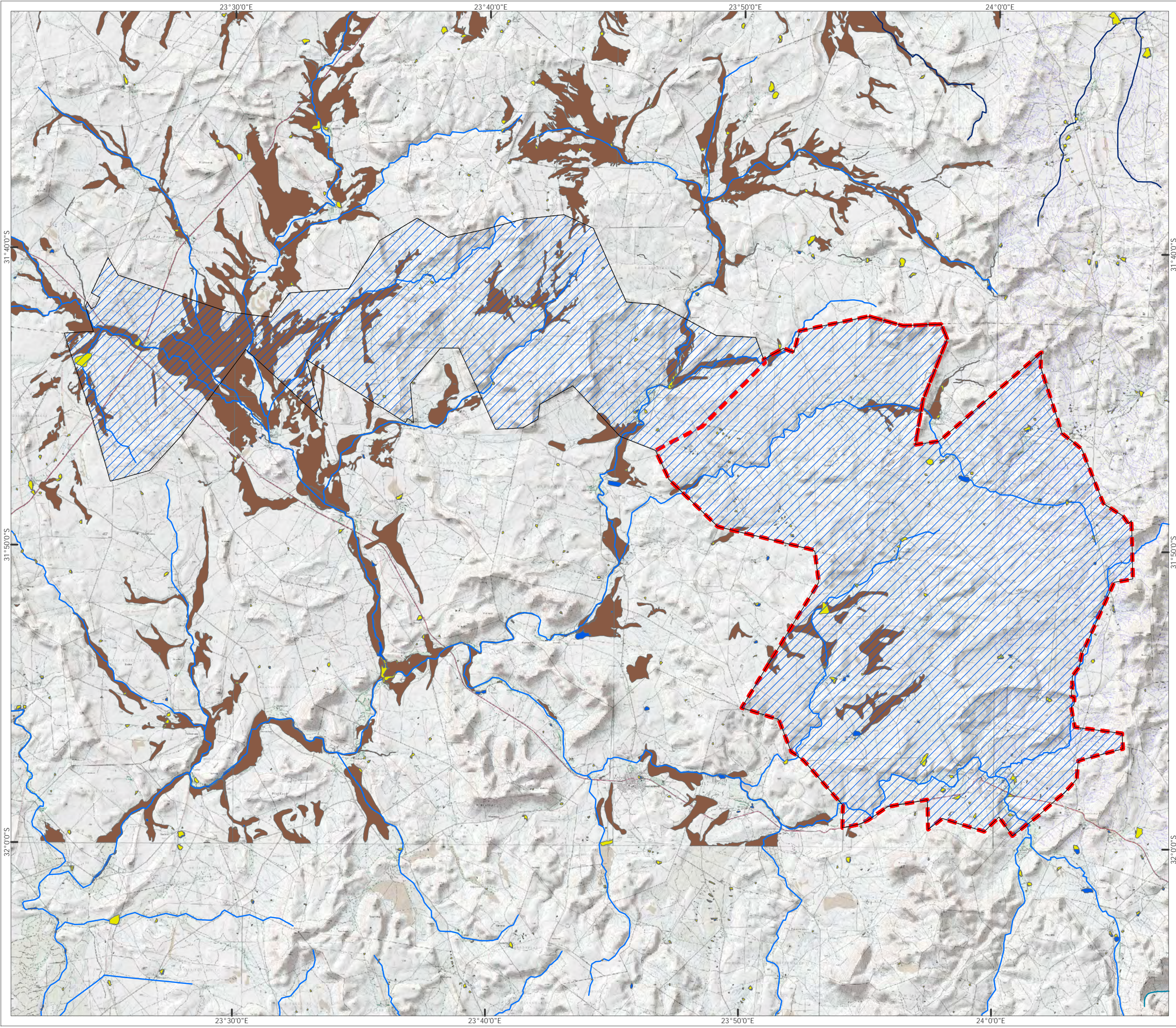


Projection: Transverse Mercator  
 Datum: Hartebeeshoek 94  
 Reference Ellipsoid: WGS 84  
 Central Meridian: 23°

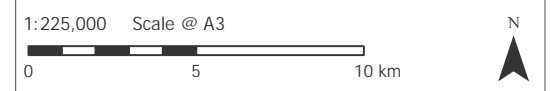


Produced: JA	Ref: 2146/REP/042
Reviewed: SC	Date: 29/03/2016
Approved: AB	

Quaternary Catchments  
and Rivers  
Figure 8.4

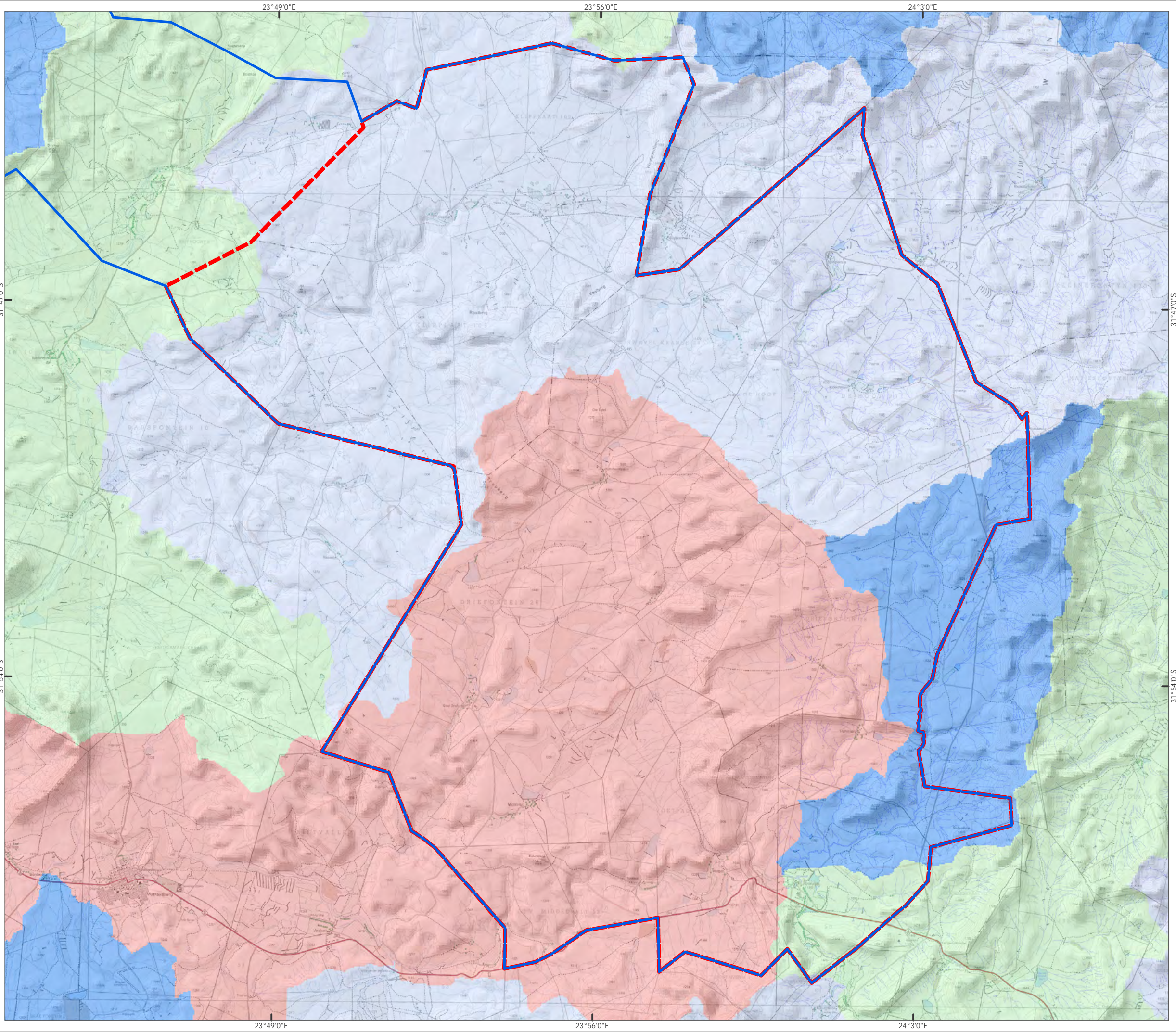


- WEF Site Boundary
- Grid Site Boundary
- 3123 Alluvial / Floodplain
- NFEPA Wetland Type
  - Artificial
  - Natural
- NFEPA Rivers
  - CLASS B: LARGELY NATURAL
  - CLASS C: MODERATELY MODIFIED
  - CLASS D: LARGELY MODIFIED



Produced: JA	Ref: 2146/REP/043
Reviewed: SC	Date: 06/02/2018
Approved: AB	

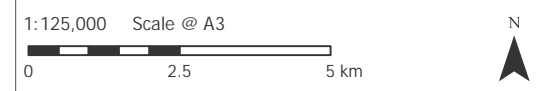
Surrounding River Areas and  
Potential Wetlands  
Figure 8.5



- WEF Site Boundary
- Grid Site Boundary

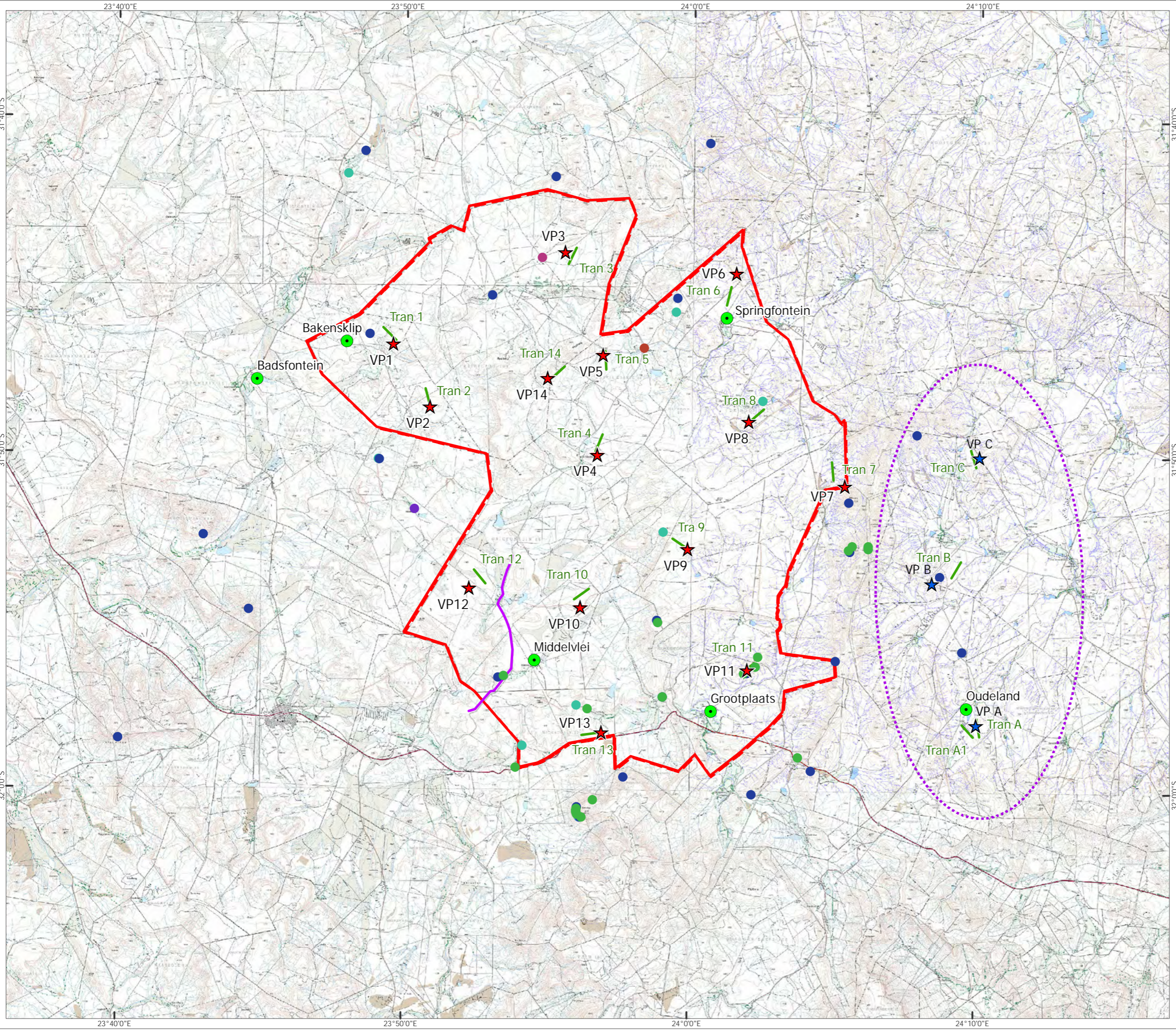
**River FEPA**

- FEPA
- FishCorrid
- FishFSA
- Upstream



Produced: JA	Ref: 2146/REP/044
Reviewed: SC	Date: 06/02/2018
Approved: AB	

Freshwater Ecosystem  
Priority Areas  
Figure 8.6



- - - WEF Site Boundary
- . . . Arbitrary Control Site Boundary
- ★ Vantage Point
- ★ Control Vantage Point
- Surveyed Wetland
- Walked Transect
- Night Driven Transect

**Nest Sites**

- Verreaux's Eagle
- Pale-chanting Goshawk
- Peregrine Falcon
- Jackal Buzzard
- Martial Eagle
- Rock Kestrel
- Rufous-chested Sparrowhawk

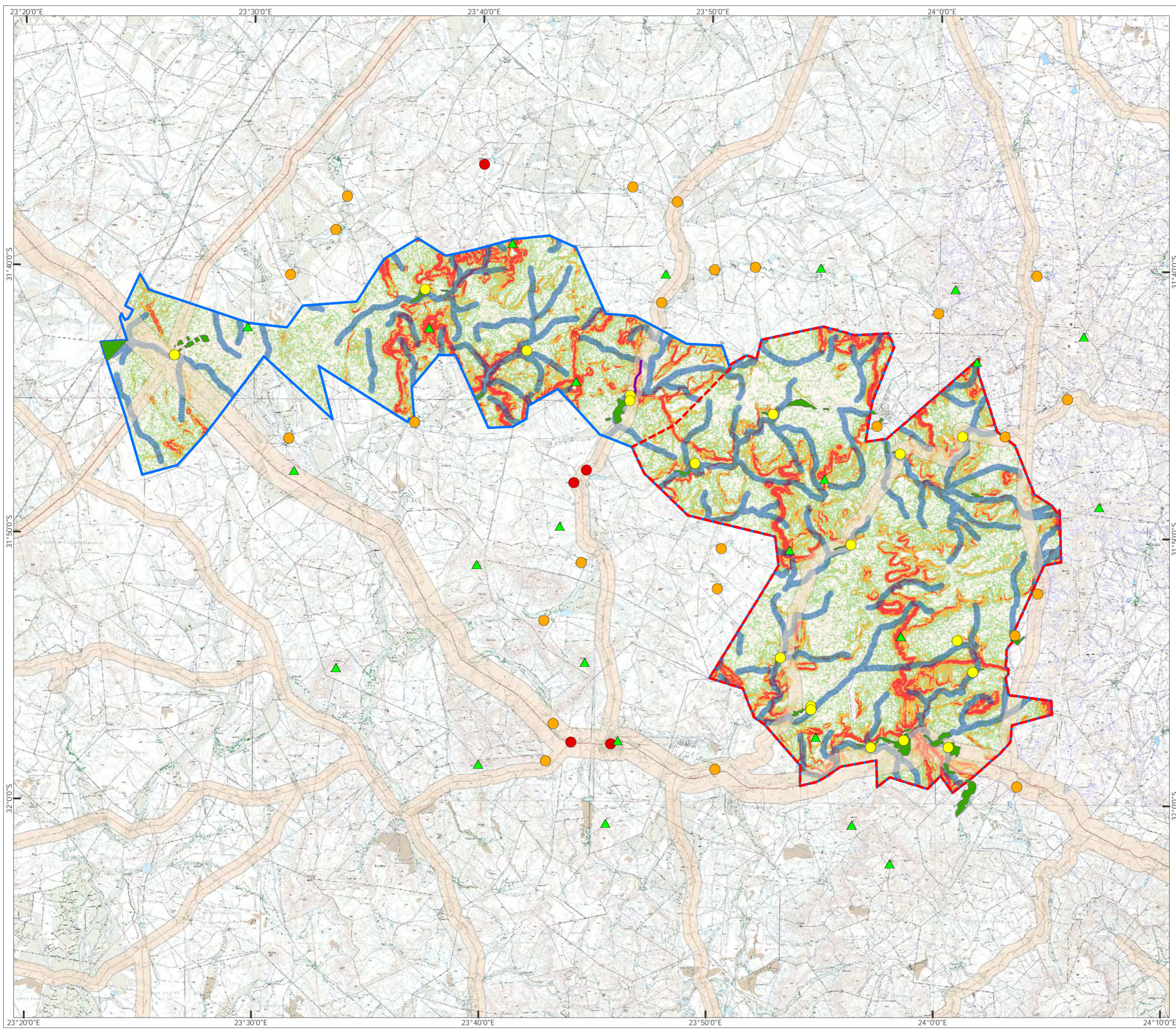


Projection: Transverse Mercator  
 Datum: Hartbeeshoek 94  
 Reference Ellipsoid: WGS 84  
 Central Meridian: 23°



Produced: JA	Ref: 2146/REP/045
Reviewed: SC	Date: 31/03/2016
Approved: AB	

Avifaunal Monitoring **Initial** Survey Locations and Identified Nests  
 Figure 8.7



- WEF Site Boundary
- Grid Site Boundary
- Farmstead within Site
- Farmstead outside Site
- Town or Guestfarm
- ▲ Peak
- Scenic Poort
- River Area (500 m)
- Cultivated Land
- 1 km / 500 m around National / Regional Roads
- Slope less than 1:20
- Slope at 1:20
- Slope at 1:10
- Slope at 1:5



Produced: AT	Ref: 2146/REP/046
Reviewed: SC	Date: 31/03/2016
Approved: AB	

Visually Sensitive Landscape or Scenic Resources  
Figure 8.8



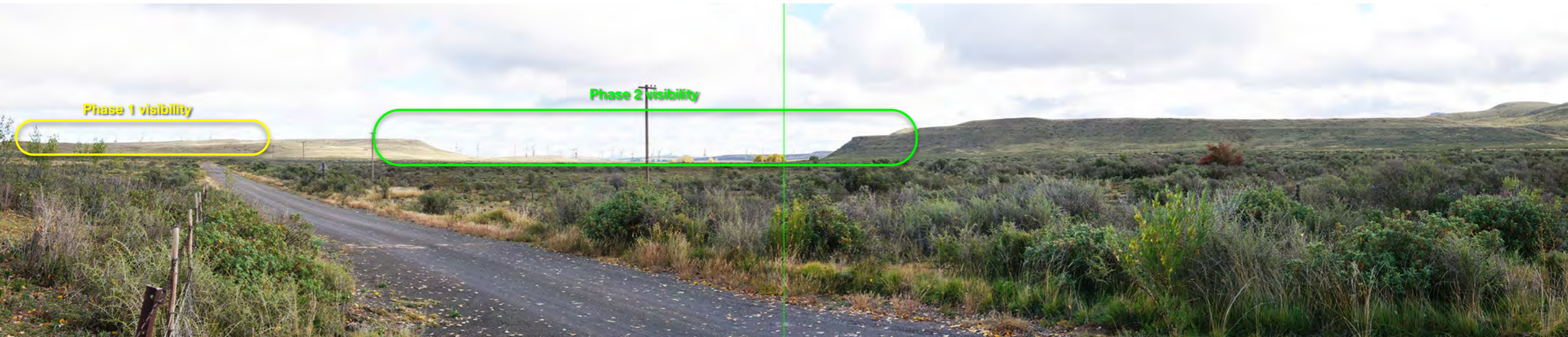
**viewpoint 3** • R63 at Poortjie - looking north-west towards WEF site on skyline. Only Phase 1 WEF would be moderately visible but partly obscured by the foreground ridges.

31.9825S, 24.0600E 12.7km



**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



**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 8.9 • Viewpoint Photomontages**

photographs : bola/mlb 2014



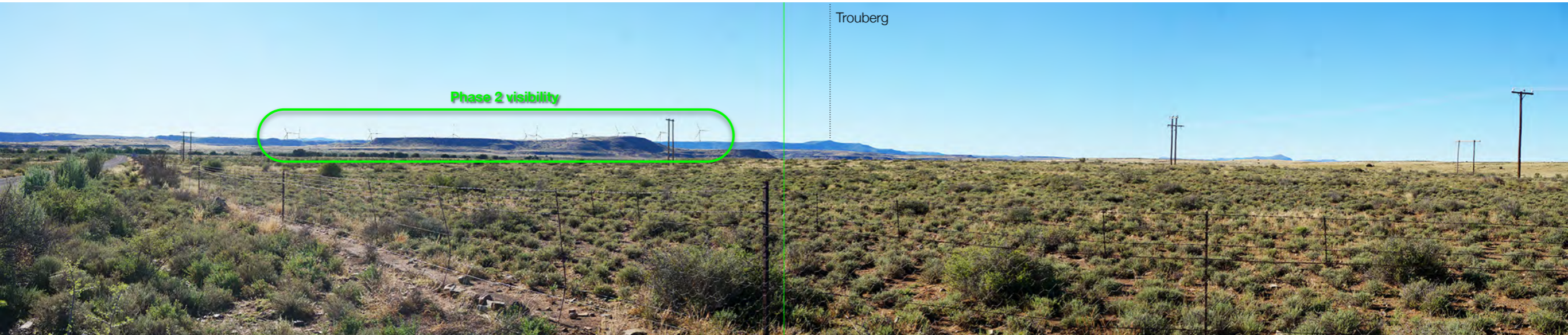
viewpoint 7 • Phillipskraal - looking south-west on boundary of WEF site. Both Phase 1 and 2 WEF would be highly visible in the foreground.

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.

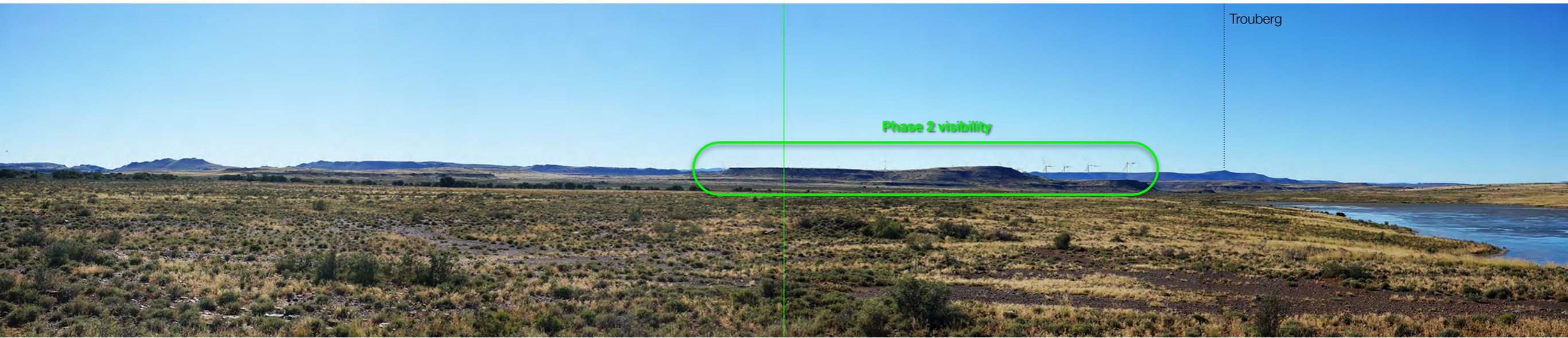
31.8016S, 23.7373E 15.19km



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 8.10 • Viewpoint Photomontages**



Trouberg

Phase 2 visibility

**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



Spitskop

Phase 2 visibility

Phase 1 visibility

**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



Phase 2 visibility

**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

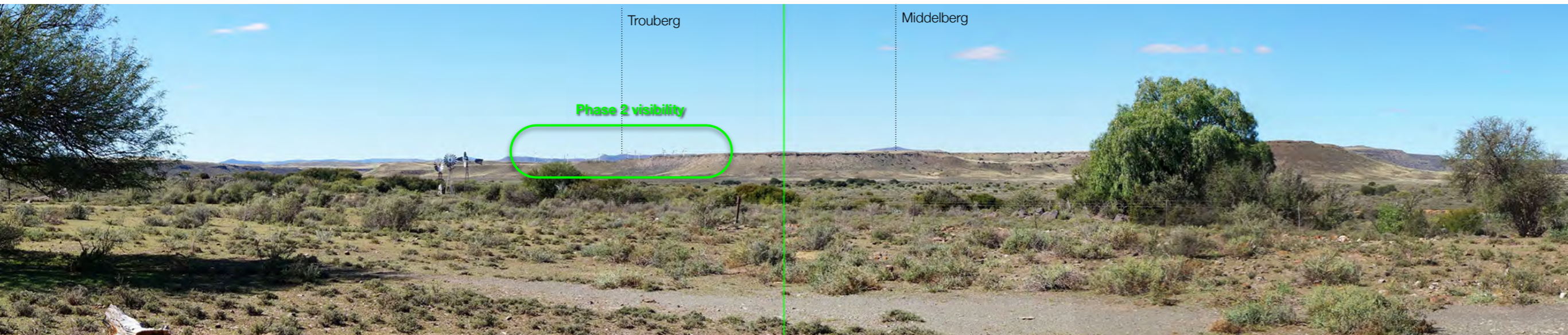
**Figure 8.11 • Viewpoint Photomontages**





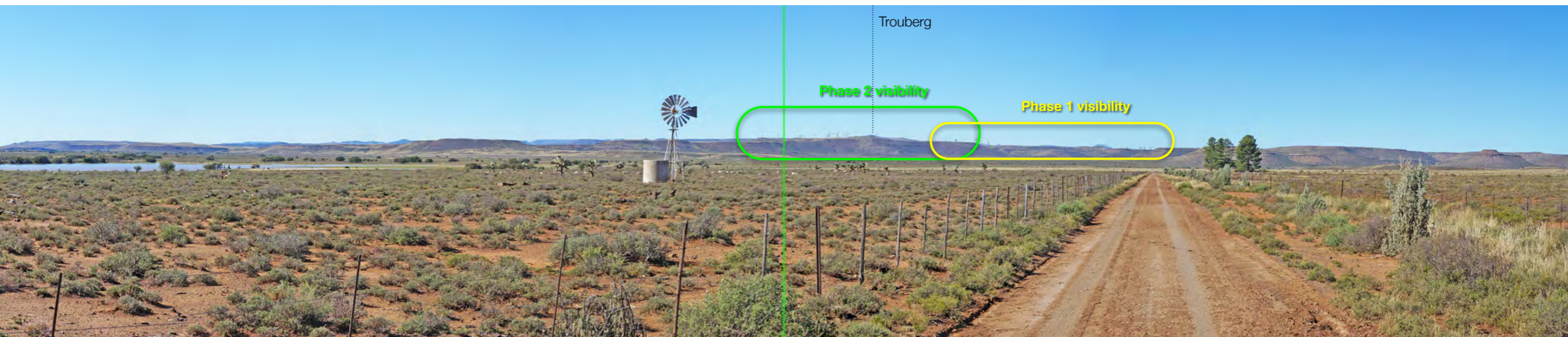
**viewpoint 16** • Rooisandheuwel Farmstead- looking south-east towards WEF site. Only Phase 2 WEF would be marginally visible on the skyline, but mostly obscured by foreground ridges.

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.

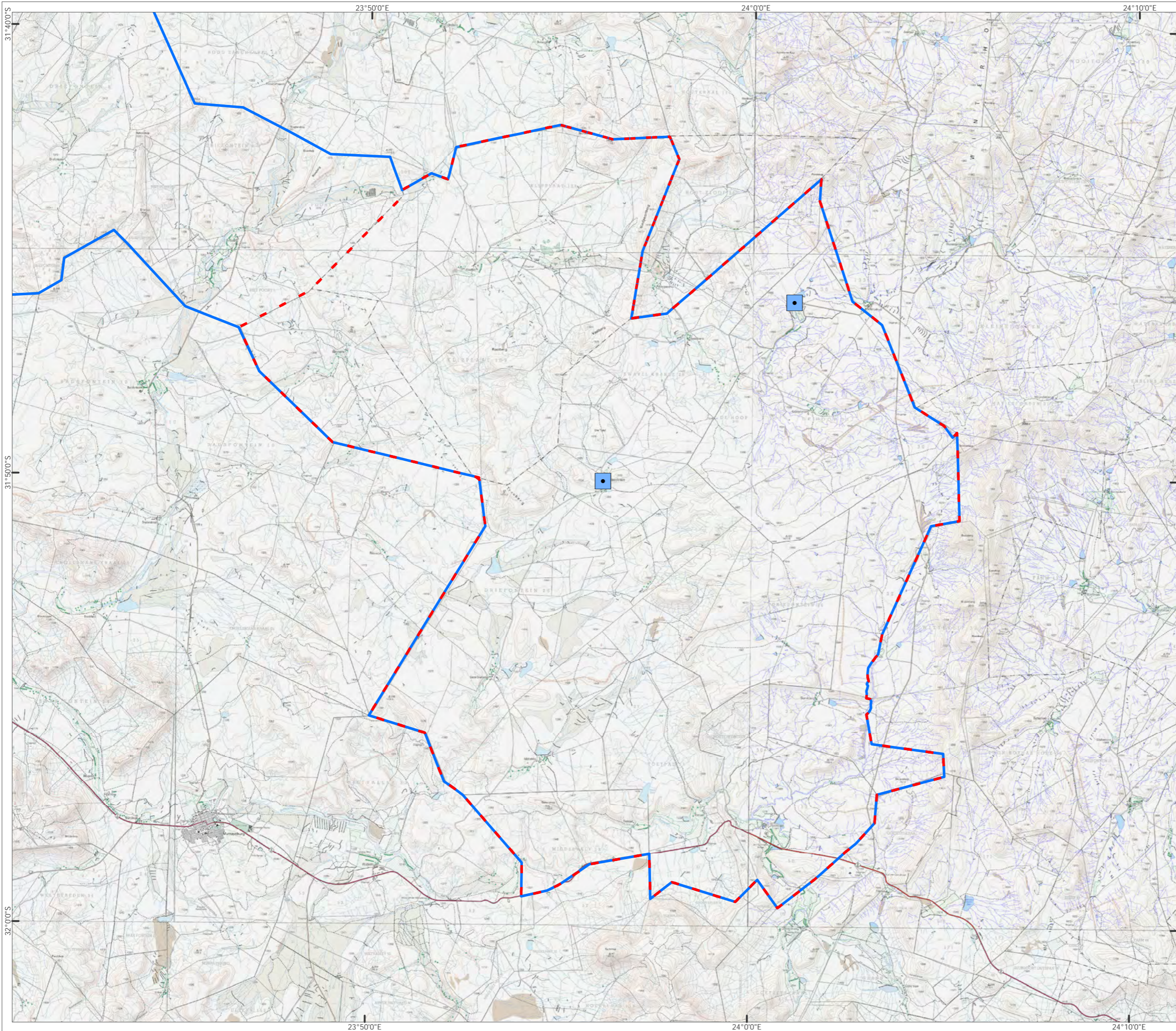
31.8500S, 23.7432E 14.94km



**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 8.12 • Viewpoint Photomontages**

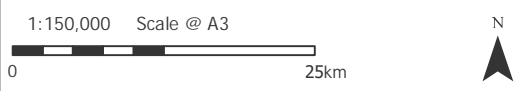
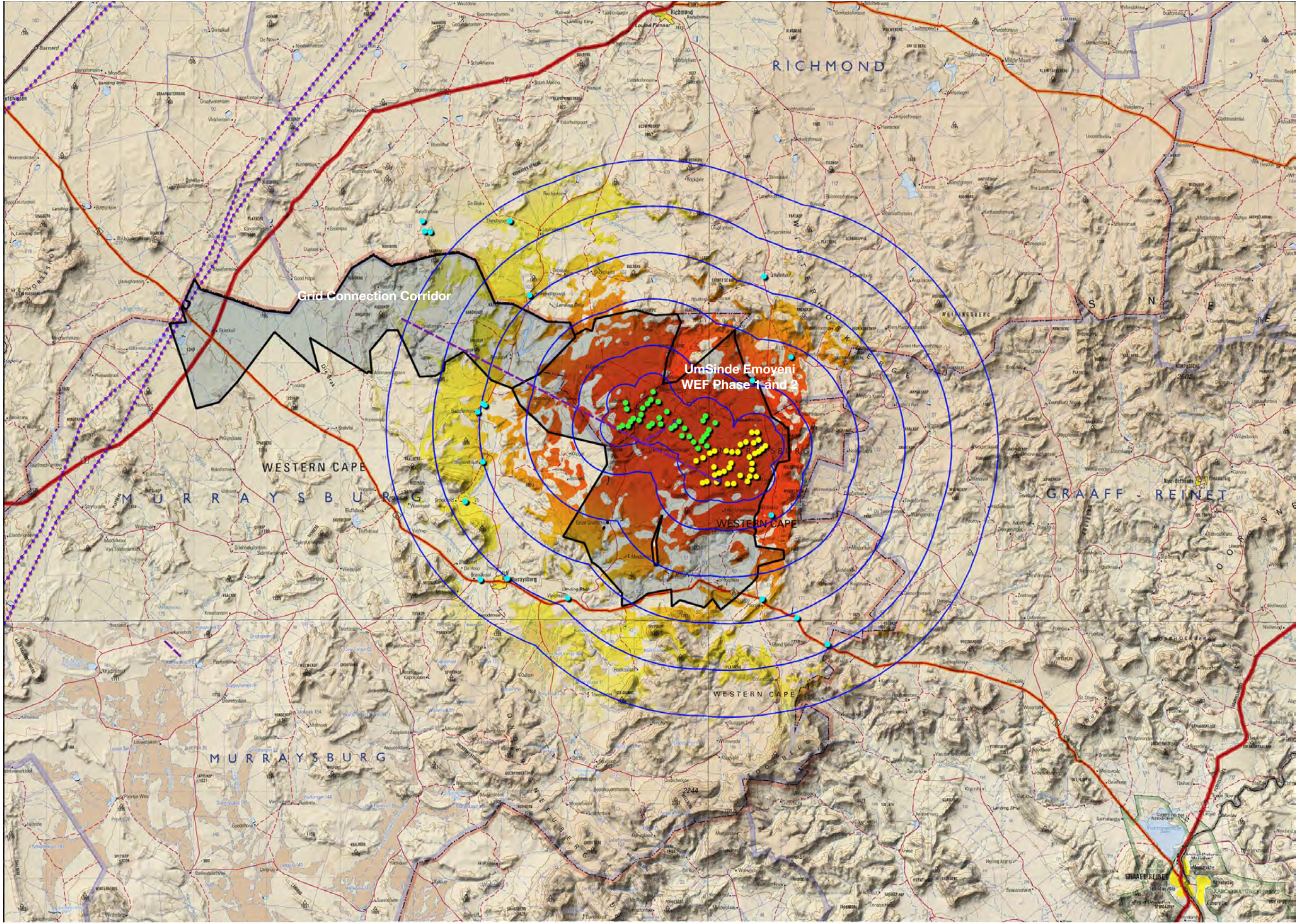


- - - WEF Site Boundary
- \_ \_ \_ Grid Site Boundary
- Ambient Sound Measurement Location



Produced: JA	Ref: 2146/REP/052
Reviewed: SC	Date: 29/03/2016
Approved: AB	

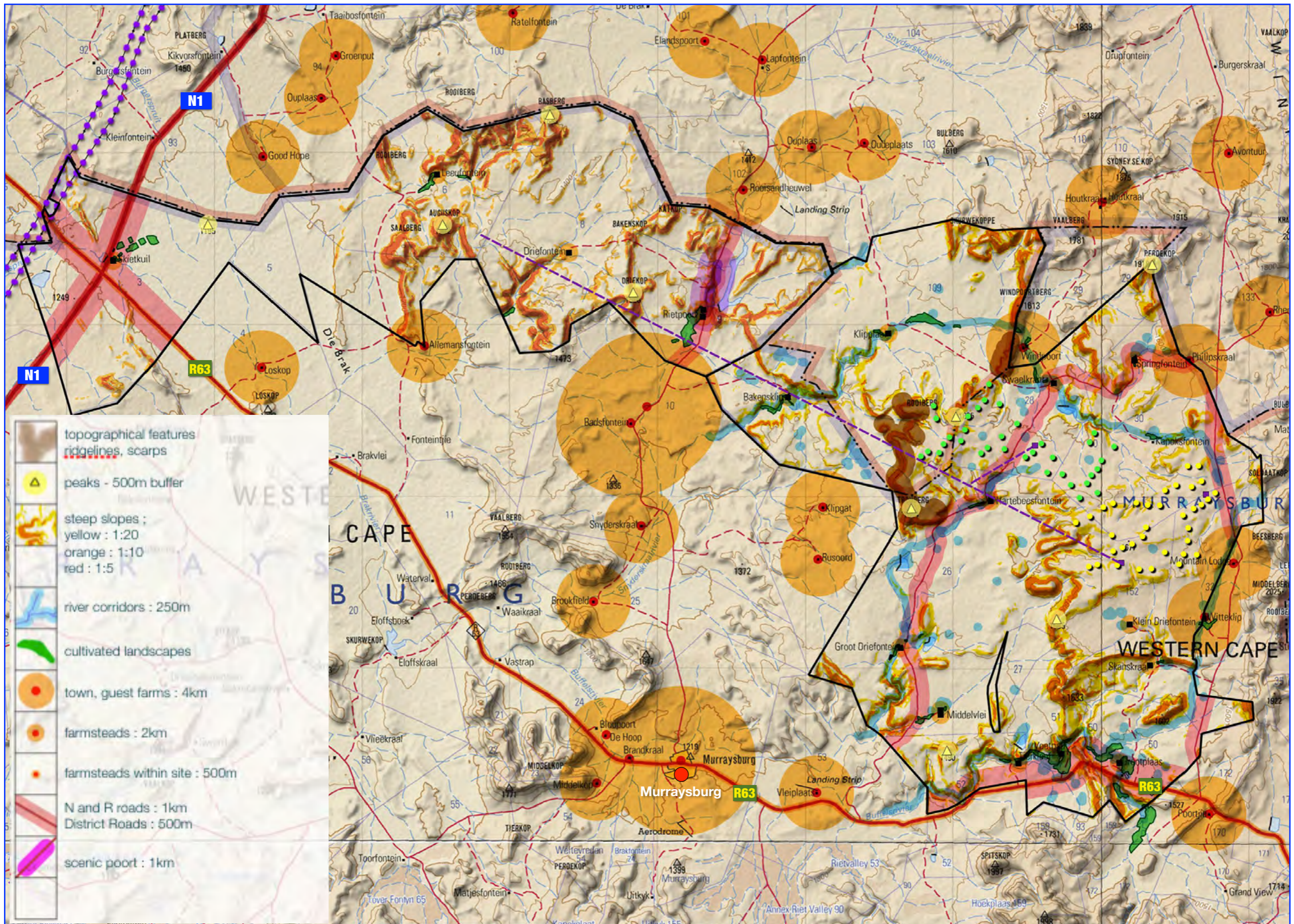
Sound Measurement locations  
Figure 8.14



Produced: AT	Ref: 2146/REP/053
Reviewed: SC	Date: 10/01/2016
Approved: AB	

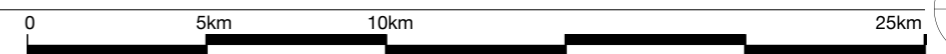
Viewshed  
Figure 9.1

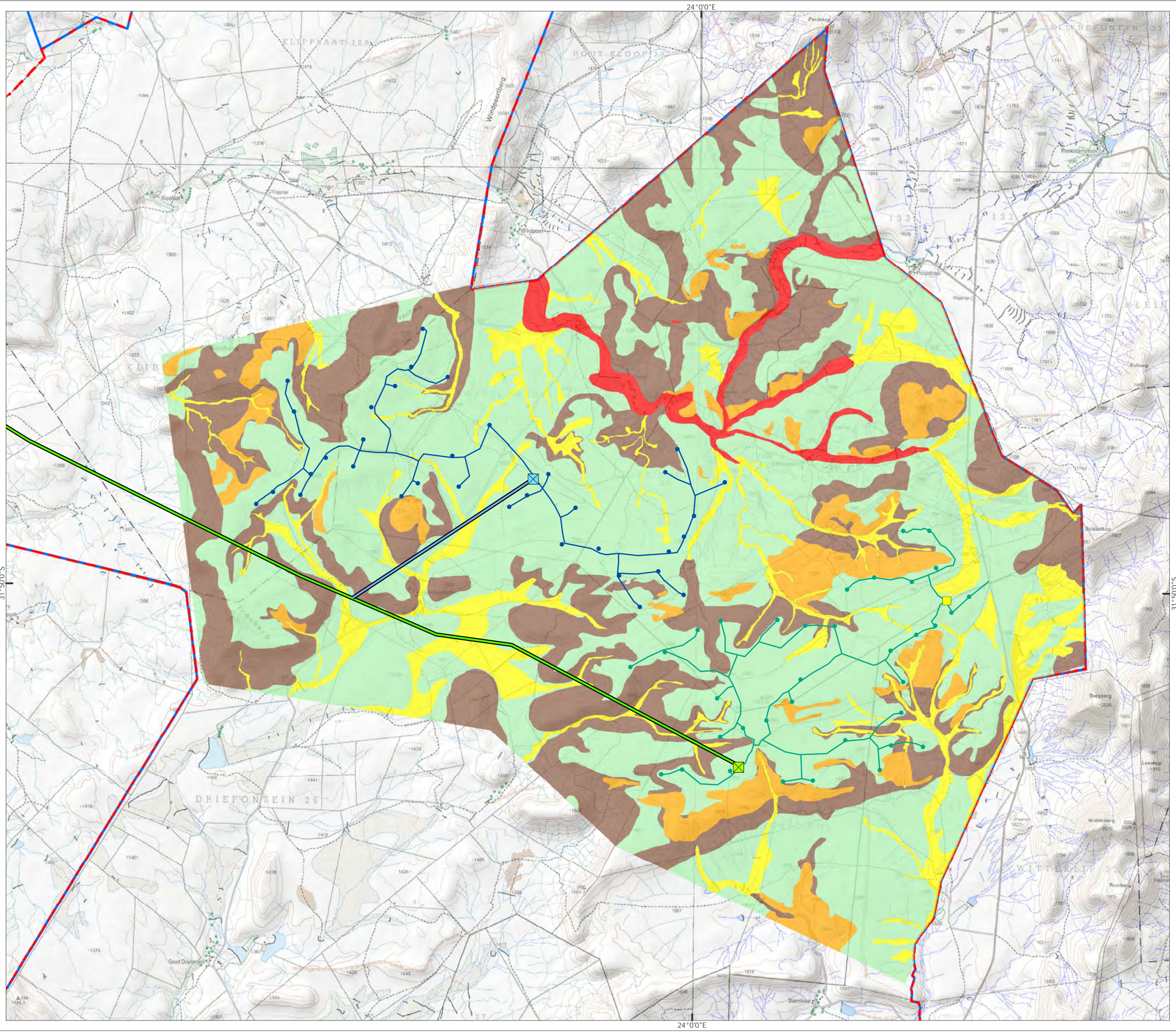
Umsinde Emoyeni WEF Phase 1  
**Final EIA Report**



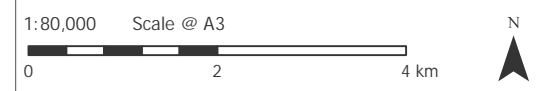
Base Map Source : Chief Directorate : National Geo-Spatial Information : 1:250 000 Topo-Cadastral Series : 3122 Victoria West (4) 2005, 3124 Middelburg (5) 2009, 3222 Beaufort West (5) 2005, 3224 Graaf Reinet (5) 2005

Figure 9.2 • Visual Informants Composite Map • WEF Rev W 2018 Phase 1 and 2





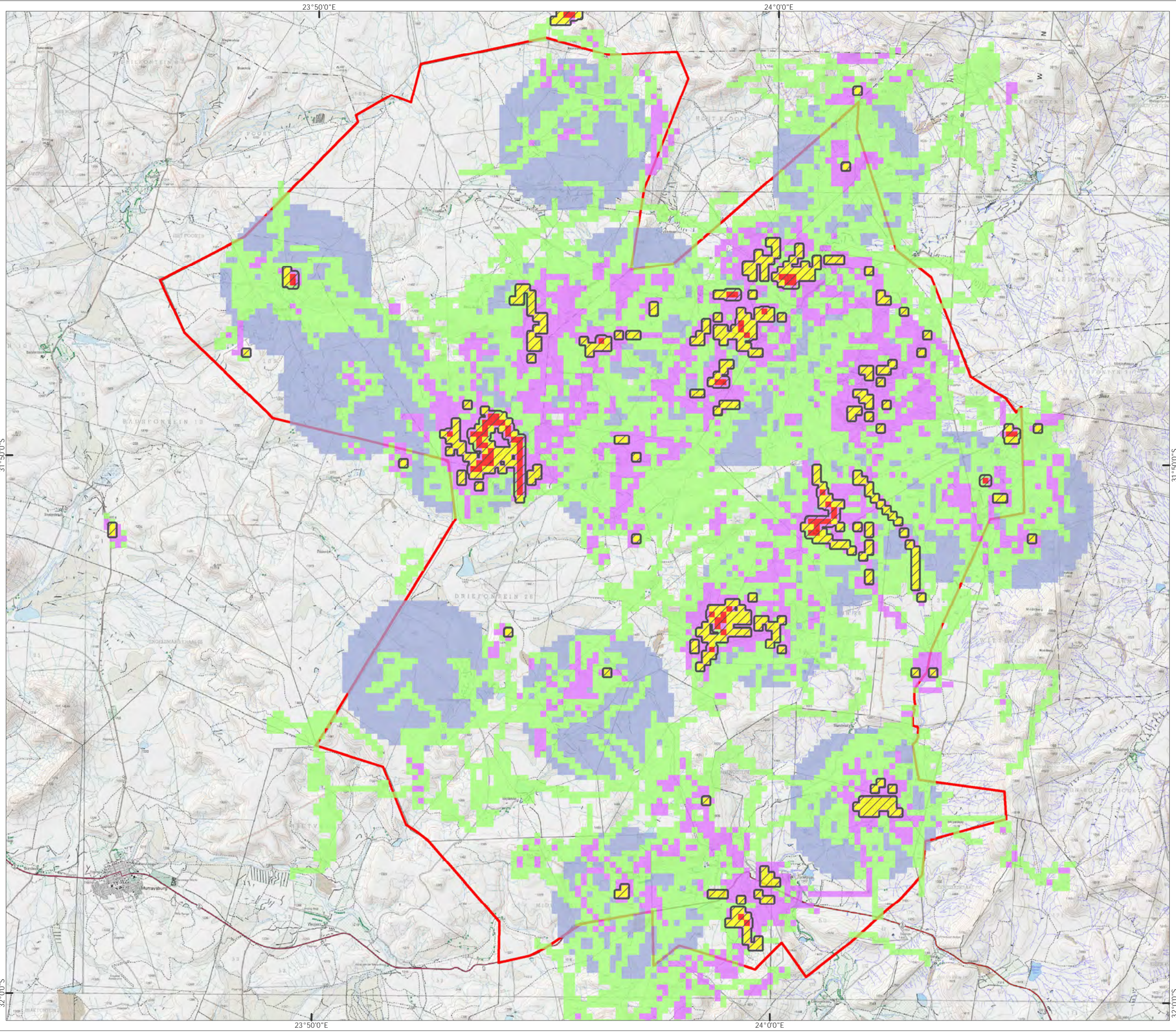
- WEF Site Boundary
  - Grid Site Boundary
  - Phase 1 Turbine Position
  - Phase 2 Turbine Position
  - Proposed Substation Phase 1
  - Phase 1 Laydown yard
  - Proposed Substation and Laydown Yard Phase 2
  - Phase 1 Preferred Grid Route
  - Phase 2 Preferred Grid Route
  - Proposed Road Phase 1
  - Proposed Road Phase 2
- Ecological Sensitivity
- Medium (Plains)
  - High (Washes and Minor Drainage)
  - High-Slopes (Steep slopes and Hills)
  - High-Very High (Dolerite Outcrops)
  - Very High (Steep)



Produced: JA	Ref: 2146/REP/011
Reviewed: RMc	Date: 05/02/2018
Approved: AB	

Ecological Sensitivity  
Figure 9.4

Umsinde Emoyeni WEF  
Phase 1  
Final EIA Report



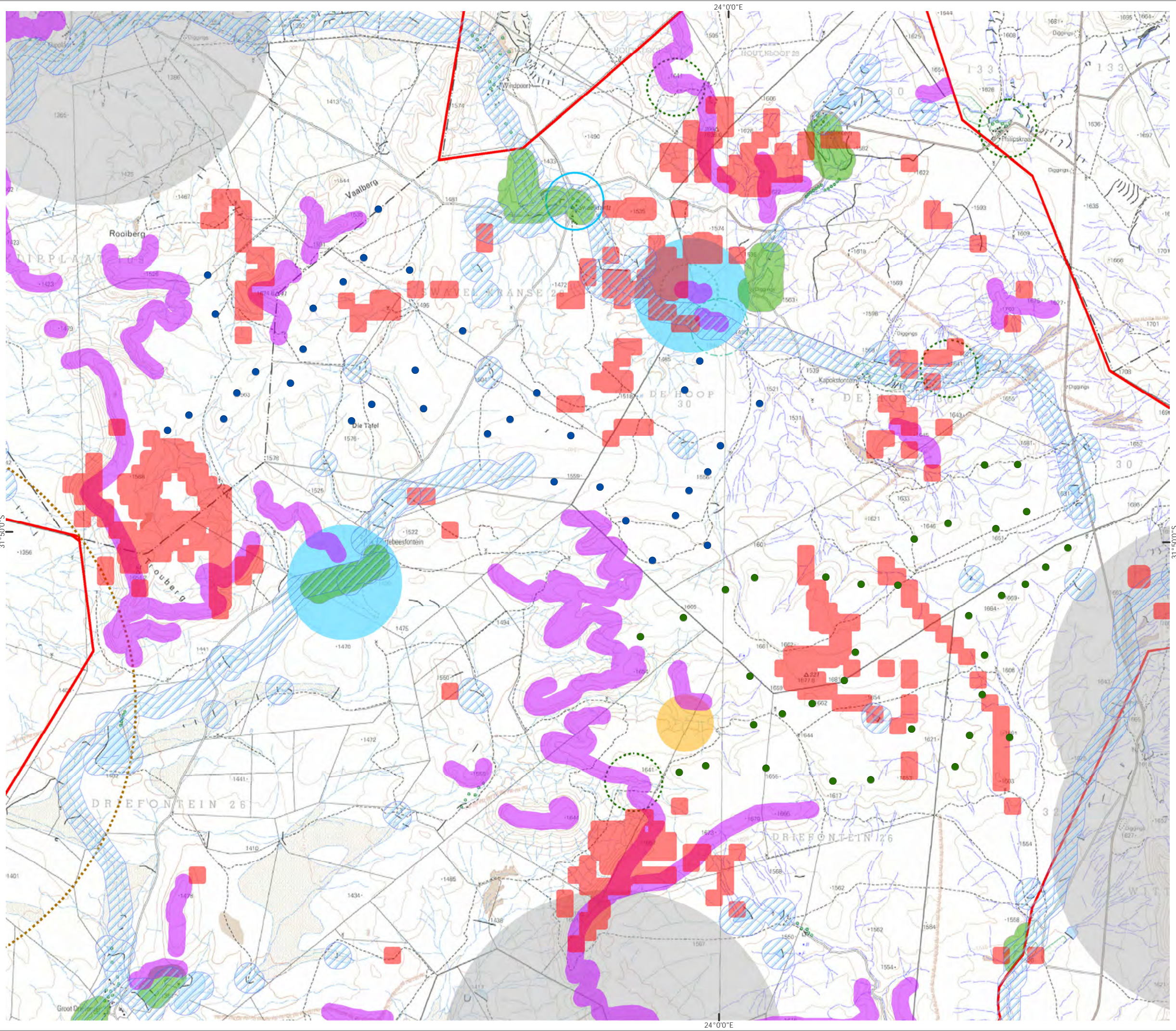
- WEF Site Boundary
- No-go for turbine and powerline placement
- Flight Sensitivity Score**
  - Areas with no observed activity within viewshed
  - Low
  - Medium
  - Medium - High
  - High

1:125,000 Scale @ A3  
0 2 4 km

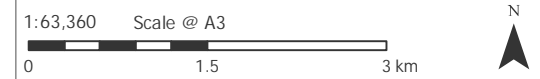
Produced: AT	Ref: 2146/REP/014
Reviewed: SC	Date: 05/02/2018
Approved: AB	

Avifauna Flight Sensitivity  
Figure 9.5

Umsinde Emoyeni WEF  
Phase 1  
Final EIA Report



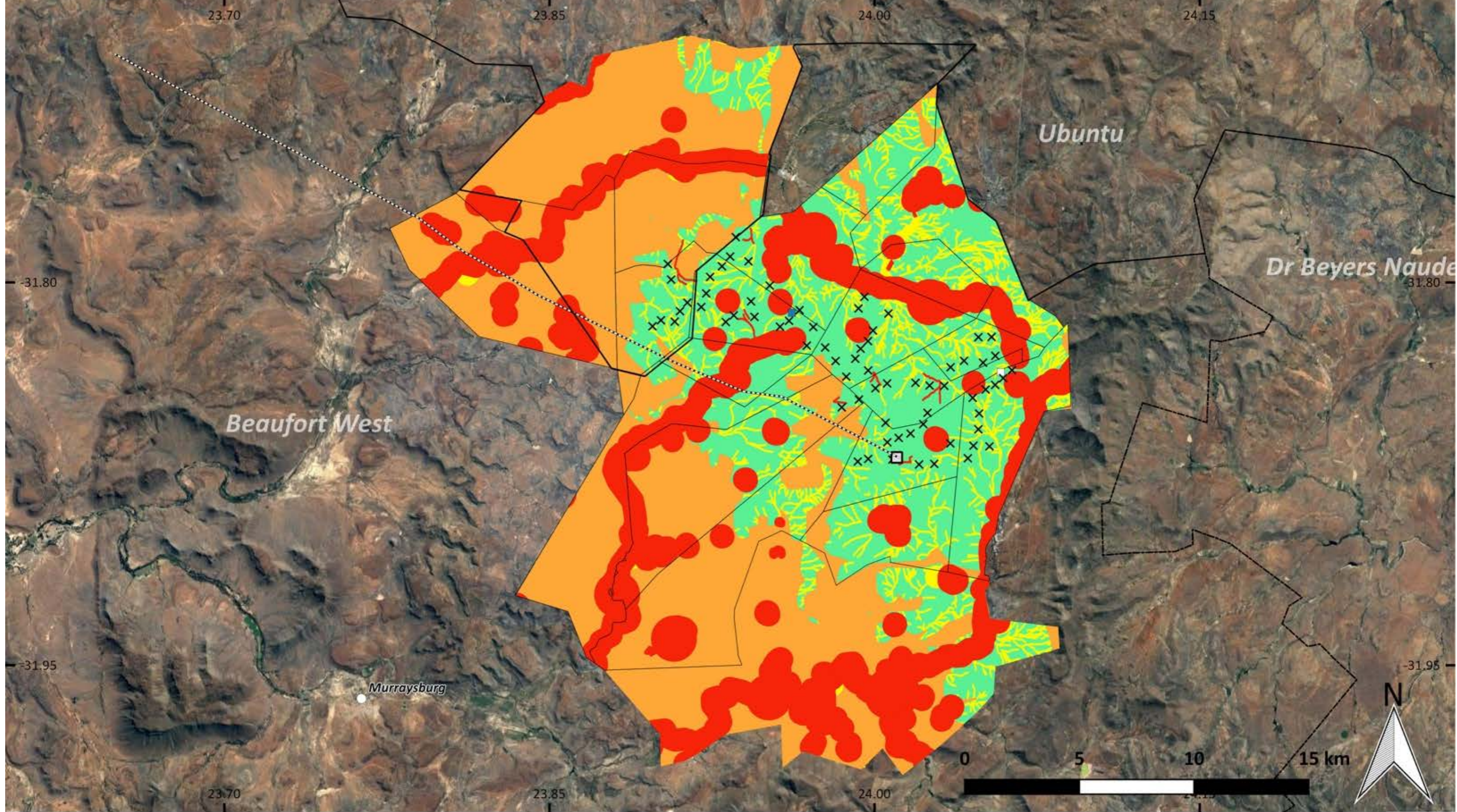
- Proposed Turbine Phase 1
- Proposed Turbine Phase 2
- WEF Site Boundary
- 3 km Verreaux's Eagle Nest Buffer
- 1 km Buffer of Verreaux's Eagle Roost
- No-Go for Turbines and Overhead Powerlines
- 200 m buffer of NFEPA Wetlands and Rivers
- 150 m Ridge Buffer
- 200 m Cultivated Lands Buffer
- Bee-eater Colony Buffer
- 500 m Rock kestrel Nest Buffer
- 500 m Buffer of Jackal Buzzard Nest
- 500 m Buffer of Rufous-breasted Sparrowhawk
- 5 km Buffer of Martial Eagle Nest



Produced: AP	Ref: 2472/REP/020
Reviewed: SC	Date: 01/02/2018
Approved: AB	

**Avifaunal No-Go Areas**

Figure 9.6



Inkululeko Wildlife Services  
 Mobile: +27 (0) 79 175 1758  
 Fax: +27 (0) 86 549 2322  
 Email: info@iws-sa.co.za



Arcus Consultancy Services  
 Tel: +27 (0) 21 412 1529

Map produced by Inkululeko Wildlife Services, 2018  
 Data source/s:  
 (e.g.)  
 Aerial Imagery - TerraMetrics (Google Earth) (2018)  
 Topography - SANBI (2006); Municipal Demarcation Board (2016)  
 WEF Infrastructure - Arcus (2017-2018)  
 Sensitivity Map - NSS (2015) and IWS (2017-2018)  
 Scale=1:266 000

**Legend**

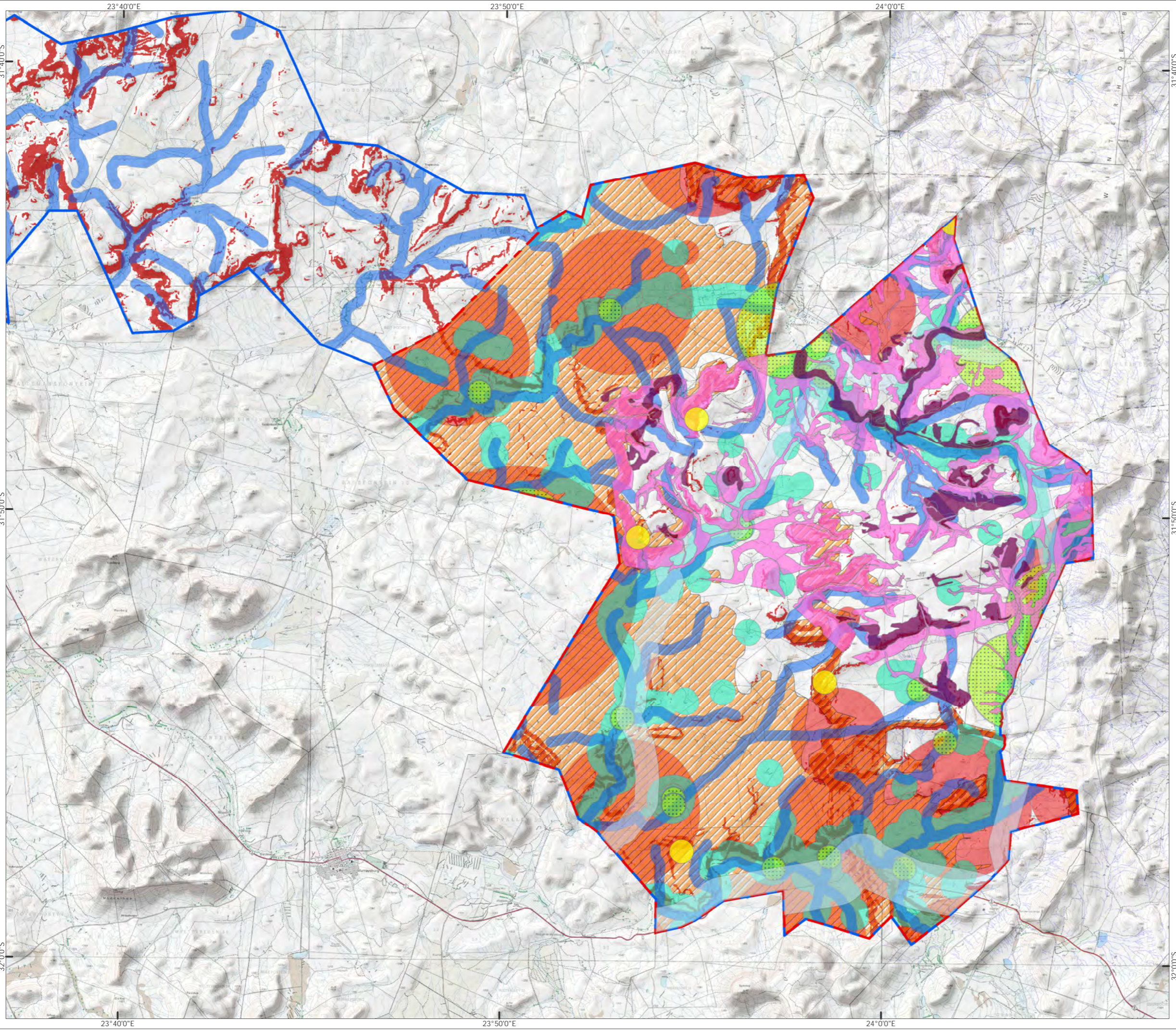
Bat Sensitivity  
Figure 9.7

× Wind Turbine (Both Phases) (Proposed)	□ Umsinde Key Properties	Orange Medium-High
□ Phase 1 Substation (Proposed)	□ Municipal Boundary	Yellow Medium
----- Grid Transmission Line (Proposed)	○ Town	Green Low
□ Phase 1 Laydown Yard	<b>Bat Sensitivity</b>	Red High
■ Phase 2 Substation and Laydown Yard		

Umsinde Emoyeni WEF  
Phase 1  
Final EIA Report



Basemapping from Chief-Directorate: National Geo-Spatial Information of South Africa

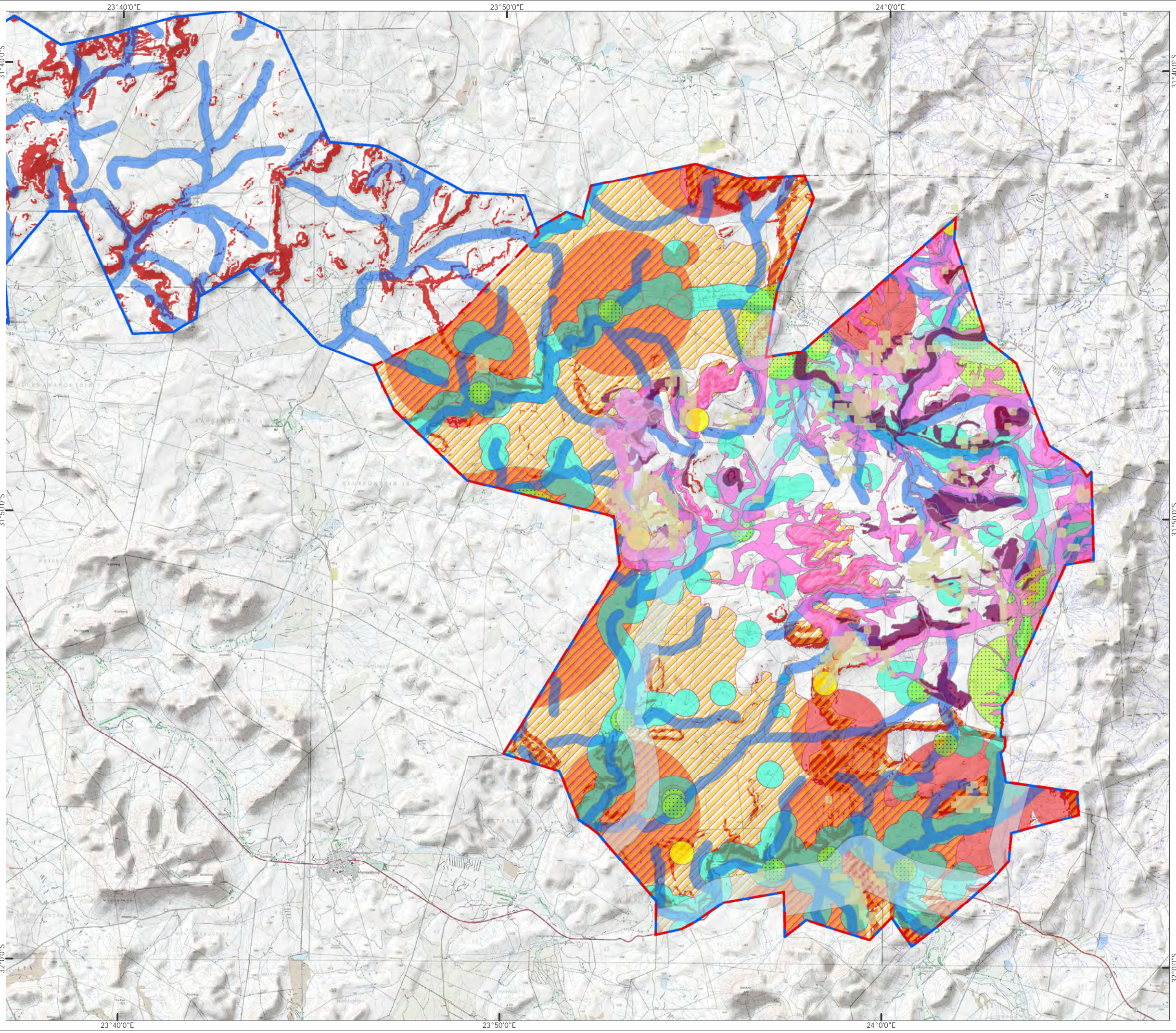


- Grid Site Boundary
- WEF Site Boundary
- 500 m River Buffer
- High Ecological Sensitivity
- High-Very High Ecological Sensitivity
- High Bat Sensitivity
- Medium - High Bat Sensitivity
- Nest Buffer
- 500 / 2000 m Farm Buffer
- 500 m Buffer of Peak
- National / Regional Road Buffer
- Slope 1:5



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Environmental Constraints  
**2015**  
Figure 9.8



-  Grid Site Boundary
-  WEF Site Boundary
-  500 m River Buffer
-  Visual Ridgeline Buffer
-  High-very high Ecological Sensitivity
-  High Ecological Sensitivity
-  Avifaunal Buffers
-  Avifaunal Nest Buffer
-  High Bat Sensitivity
-  Medium-high Bat Sensitivity
-  500 / 2000 m Farm Buffer
-  500 m Buffer of Peak
-  National / Regional Road Buffer
-  Slope 1:5

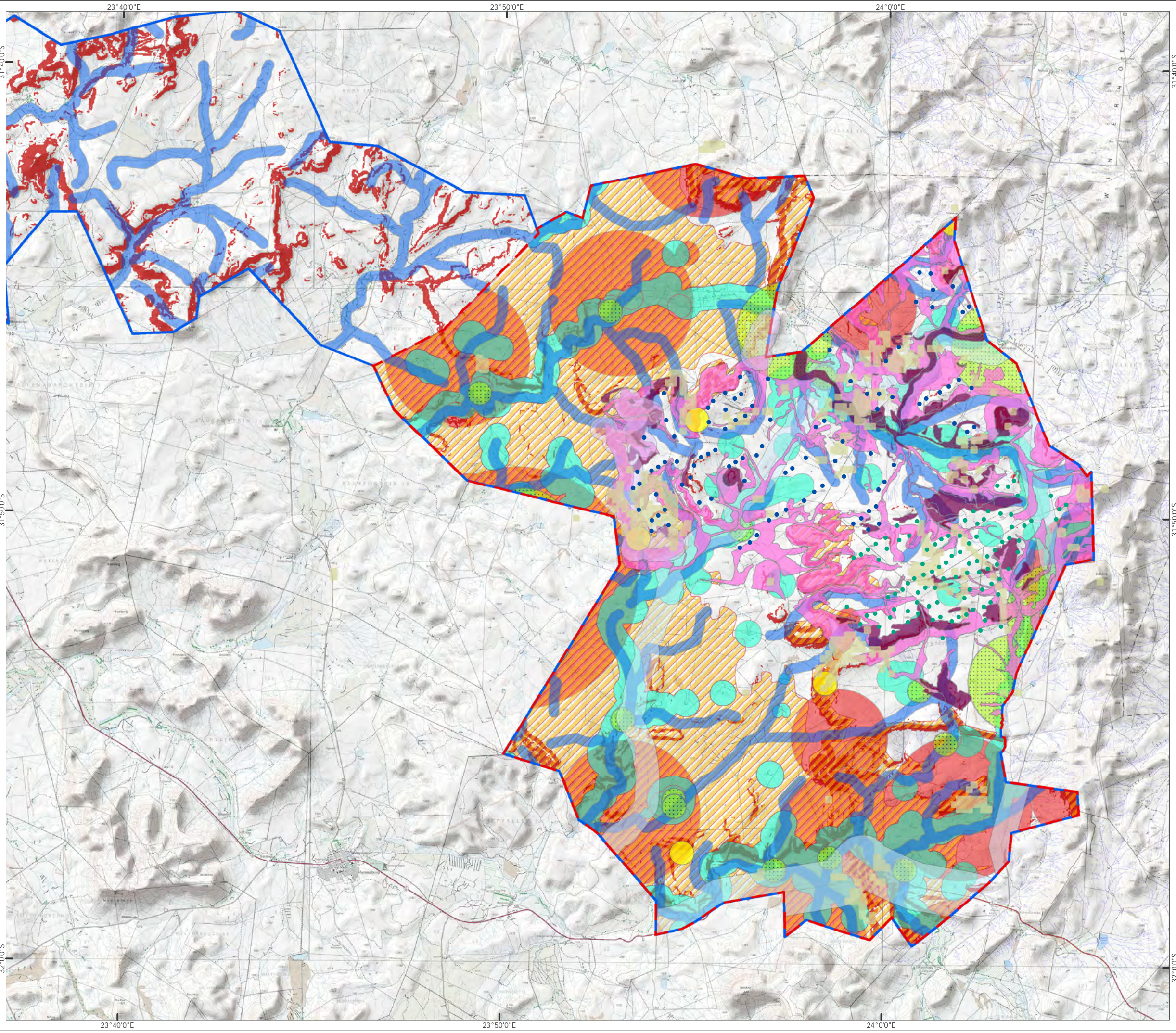
1:150,000 Scale @ A3  
 0 4 8 km 

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Environmental Constraints  
**2018**  
 Figure 9.8b

Umsinde Emoyeni WEF  
 Phase 1  
 Final EIA Report

Basemapping from Chief-Directorate: National Geo-Spatial Information of South Africa



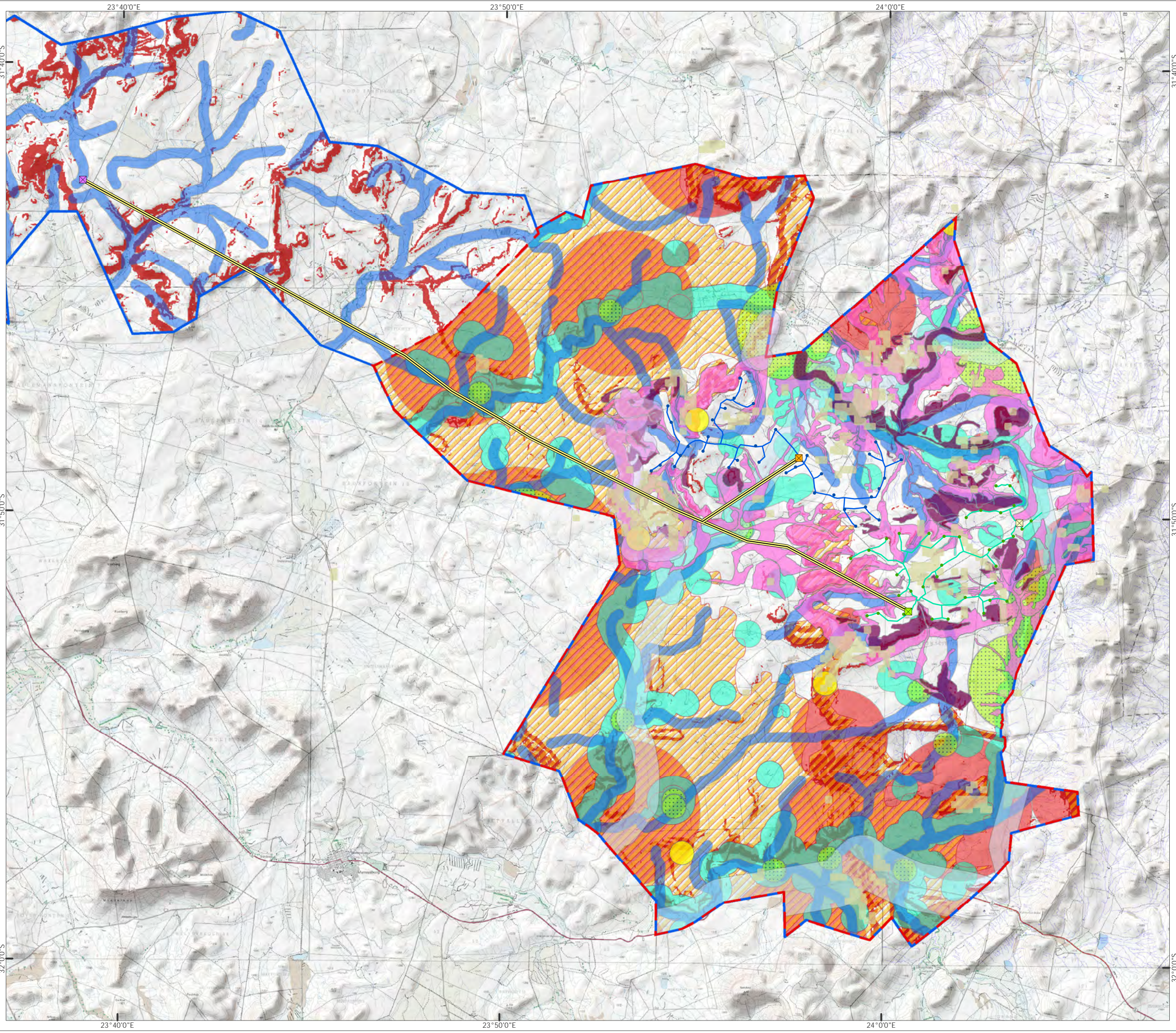
- Grid Site Boundary
- WEF Site Boundary
- Initially Proposed Turbine Position Phase 1
- Initially Proposed Turbine Position Phase 2
- 500 m River Buffer
- Visual Ridgeline Buffer
- High-very high Ecological Sensitivity
- High Ecological Sensitivity
- High Avifaunal Sensitivity
- Avifaunal Nest Buffer
- High Bat Sensitivity
- Medium-high Bat Sensitivity
- 500 / 2000 m Farm Buffer
- 500 m Buffer of Peak
- National / Regional Road Buffer
- Slope 1:5



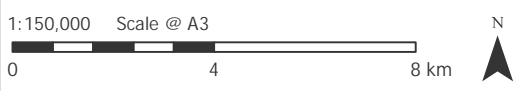
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**2018** Environmental Constraints and Initial 98 Turbine Layout  
Figure 9.9

Umsinde Emoyeni WEF  
Phase 1  
Final EIA Report



- Grid Site Boundary
- WEF Site Boundary
- Mitigated Turbine Position Phase 1
- Mitigated Turbine Position Phase 2
- Approved Ishwati Emoyeni Substation
- Proposed Substation Phase 1
- Phase 2 Substation and Laydown Yard
- Phase 1 Laydown Yard
- Phase 1 Road
- Phase 2 Road
- 500 m River Buffer
- Visual Ridgeline Buffer
- High-very high Ecological Sensitivity
- High Ecological Sensitivity
- Avifaunal Buffers
- Avifaunal Nest Buffer
- High Bat Sensitivity
- Medium-high Bat Sensitivity
- 500 / 2000 m Farm Buffer
- 500 m Buffer of Peak
- National / Regional Road Buffer
- Slope 1:5

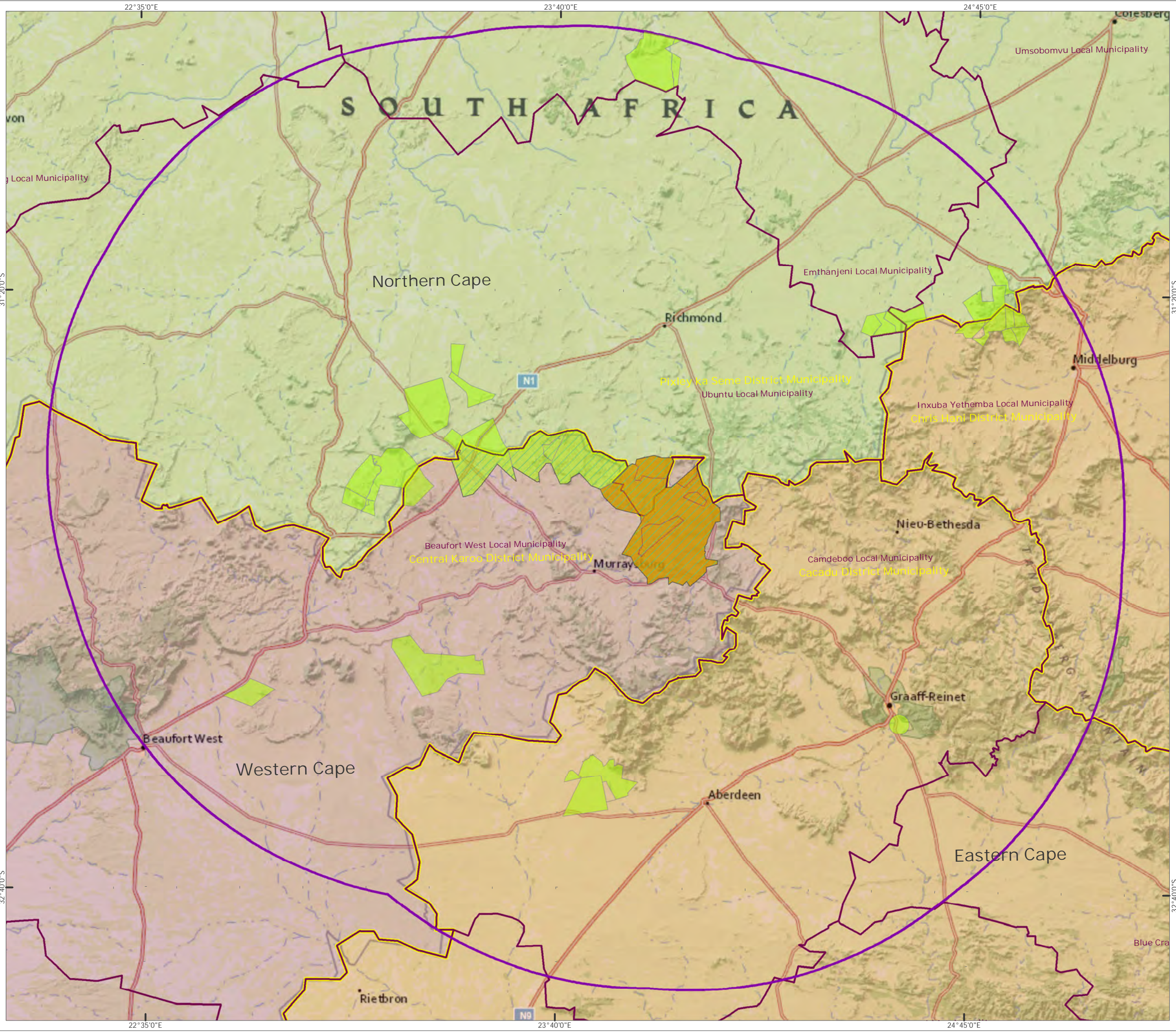


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**2018** Environmental Constraints and Mitigated 35 Turbine Layout  
Figure 9.10

Umsinde Emoyeni WEF  
Phase 1  
Final EIA Report

Basemapping from Chief Directorate: National Geo-Spatial Information of South Africa



- Grid Site
- WEF Site
- WEF applications DEA 2017 Q4
- Local Municipality
- District Boundary
- 100 km Radius
- Eastern Cape
- Western Cape
- Northern Cape



Projection: Transverse Mercator  
 Datum: Hartbeeshoek 94  
 Reference Ellipsoid: WGS 84  
 Central Meridian: 23°



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Proposed Regional  
 Wind Energy Projects  
 Figure 10.1

Umsinde Emoyeni WEF  
 Phase 1  
 Final EIA Report