AGRI informatics
NATURAL RESOURCE SPECIALISTS
Reg. Nr. IT 2594/2001 VAT Nr. 4060198118

PO Box 1458 Tel: +27 82 658 7776
7624 Suider Paarl Fax: +27 86 621 1333
SOUTH AFRICA info@agriinformatics.co.za

19 May 2021

The Environmental Assessment Practitioner
Noblesfontein Wind Energy Facility
c/o Terramanzi Group
5 Devon Air Close
Crofters Valley
Noordhoek
7975

Attention: Ms. Chané Olckers

NOBLESFONTEIN WIND ENERGY FACILITY: AGRO-ECOSYSTEMS ASSESSMENT FOR BASIC ASSESSMENT

Your request – as part of your Basic Assessment process – for a specialist agricultural assessment of the potential impact of the amendments to the Noblesfontein WEF development plan, has reference. Herewith please find my summary of findings as described below.

Introduction

An Environmental Authorisation (EA) for the installation of up to 44 wind turbines at the Noblesfontein WEF has been issued. At present only 41 turbines have been installed. Due to advances in wind generation technology an application for the installation of only two additional turbines, each with a generating capacity of between 4.0 MW and 5.6 MW, but with a total capacity of 10 MW is now made. The installation will include an access road of ±1040 m and an overhead powerline of ±470 m, as well as a sub-station adjacent to the existing sub-station. The footprint of the two new turbines is in close proximity to the earlier approved plan.

The Scoping Study for the original Environmental Assessment found that "prevailing unfavorable climatic conditions for arable agriculture as well as prevalence of soils with limited depth" did not necessitate further detailed Agricultural Potential and Land Capability investigation.

Scope of this Assessment

The aim of this assessment was (i) to confirm the limited agricultural potential of the study area, as described in the original EIR and (ii) to assess the probable change in impact of the new application to the wind energy facility (WEF) on the agro-ecosystems of the farms of the study area.

Results

The relief map (attached) indicates the positions of the two additional wind turbines, relative to the existing layout. The new turbine positions are also confined to the elevated positions in the landscape, namely the ridge lines of the hills, similar to the rest of the facility.

The climate of the area is arid (mean annual precipitation = 237 mm and annual evaporation = 2379 mm), with severe frost during the winter months (see climate summary, attached). The grazing capacity is low at ±25 ha per large stock unit (DAFF, 2018) while the soils are predominantly very shallow or rocky and non-arable.

Table 1: The Land Type data confirms the prevalence of rock or very shallow non-arable soils. The turbine positions are on Land Type IB397, while the new substation and portions of the access road and overhead powerline are on Land Type Fb489.

Land Type	Dominant Soil Type (% of area)	Sub-dominant Soil Type (% of area)	Non-arable Soils (% of Land Type)
Fb489	Rock (13.2%)	Mispah (41.2%)	54.4%
Ib397	Rock (75.5%)	Hutton <200mm (5.5%)	81.0%

The Land Capability map (attached) also reflects the low agricultural potential of the study area. All proposed turbines and appurtenant infrastructure are positioned on land capability values lower than 4. These areas have a Low Sensitivity for renewable energy generation facilities (Protocol for the assessment of environmental impacts on agricultural resources, Government Notice 648, Government Gazette 45421, May 2019). The guidelines of this protocol propose a maximum allowable development footprint of 2.5 ha per MW generating capacity for areas with Low Sensitivity and outside of field crop boundaries.

Discussion

The limitations of the agricultural resources of the study area, have been confirmed, as outlined above. The two additional turbines, despite being larger in generation capacity will have a smaller footprint than the three previously approved and thus a proportionally reduced impact on the agro-ecosystems.

The access road follows a section of old (unused) railway line, while the overhead powerline and sub-station is also situated on low potential agricultural land and will induce negligible impact on the farming activities.

I trust that these findings address your requirement in terms of the Basic Assessment Application.

Kind regards

FH Knight M.Sc.Agric.
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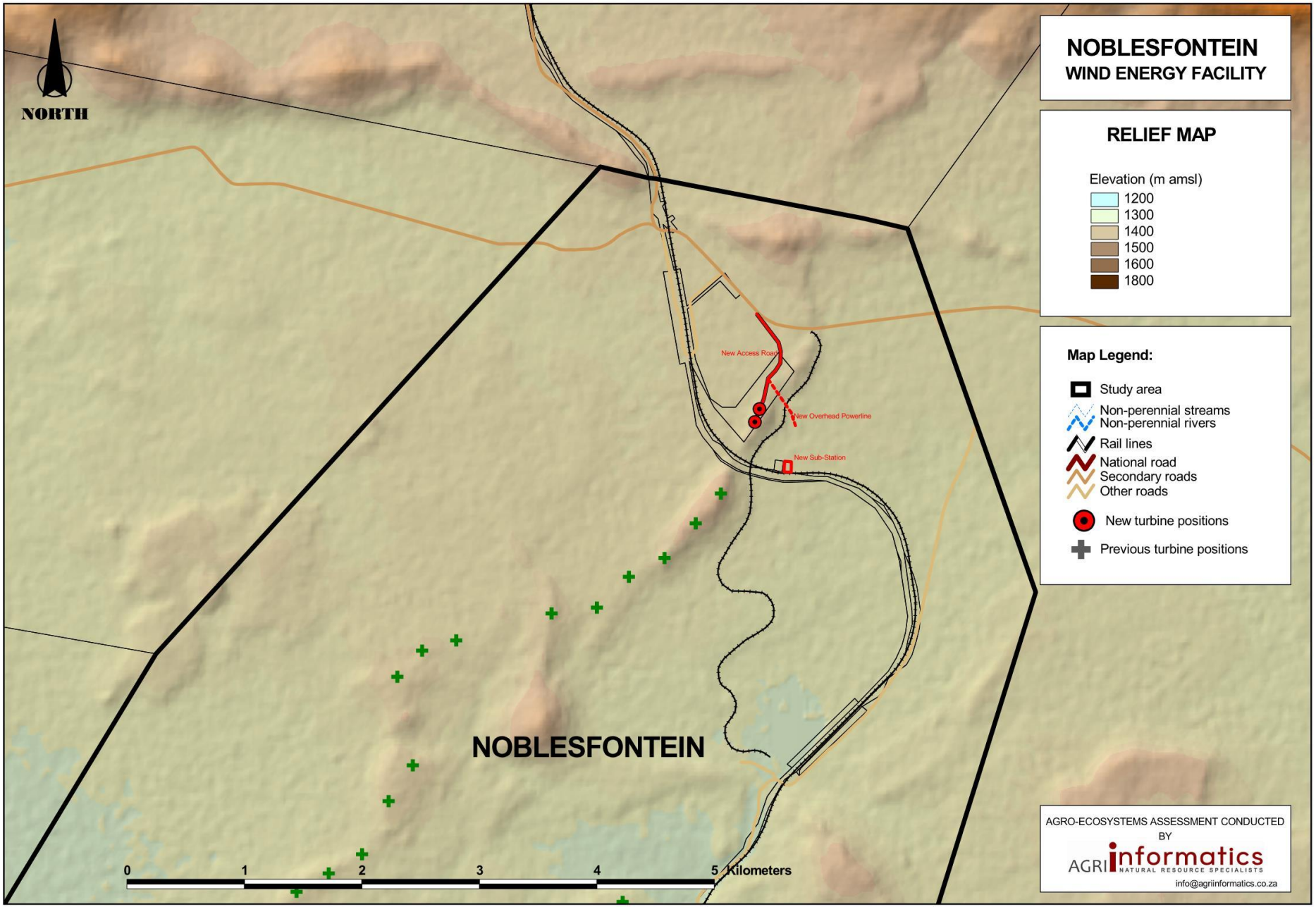
NORTH
NOBLESFONTEIN
WIND ENERGY FACILITY
RELIEF MAP
Elevation (m amsl)
1200
1300
1400
1500
1600
1800
New Access Road
New Overhead Powerline
New Sub-Station
Map Legend:
Study area
Non-perennial streams
Non-perennial rivers
Rail lines
National road
Secondary roads
Other roads
New turbine positions
Previous turbine positions
NOBLESFONTEIN
0
1
2
3
4
5 Kilometers
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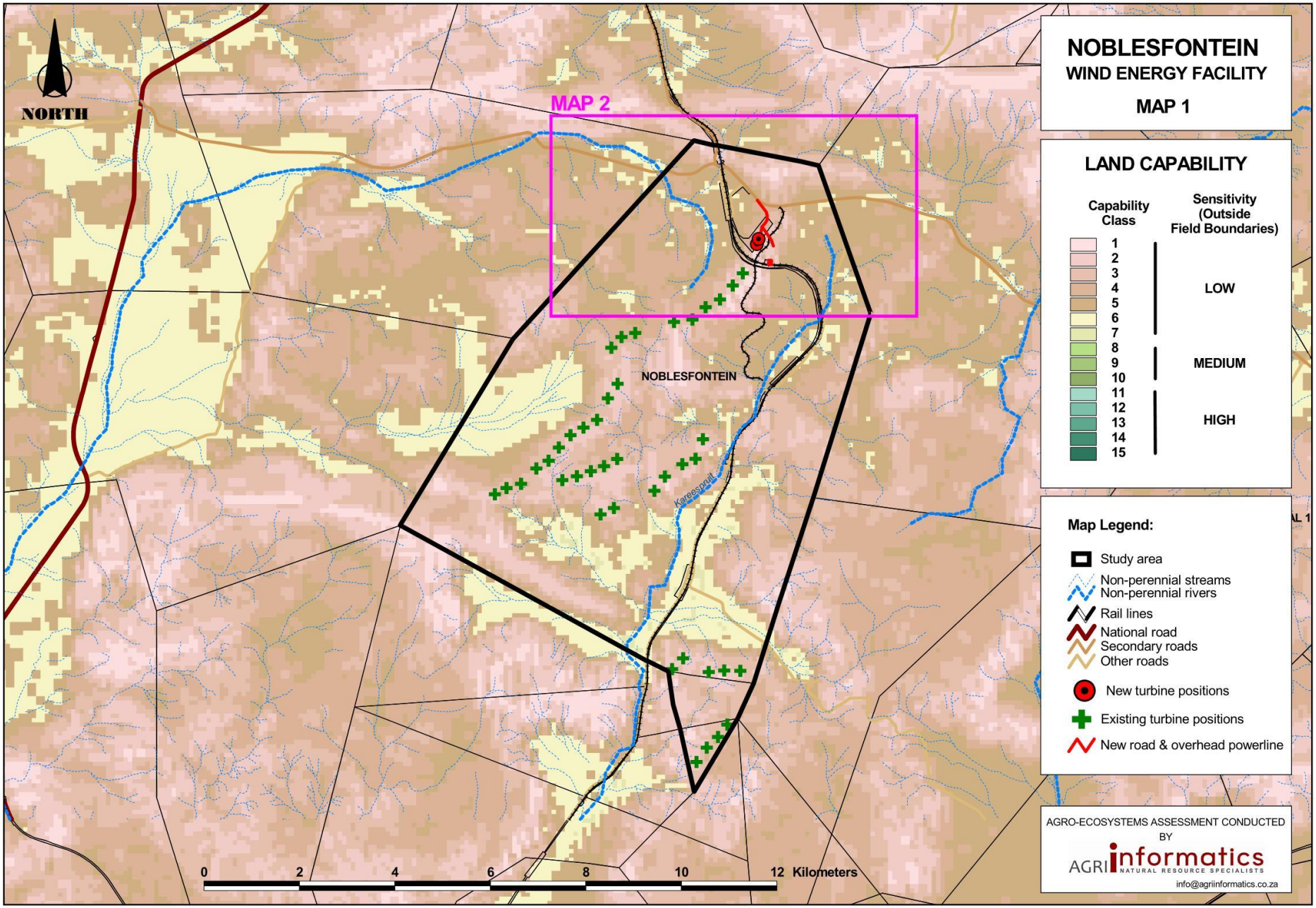
NORTH
MAP 2
NOBLESFONTEIN
Kareespruit
0 2 4 6 8 10 12 Kilometers
NOBLESFONTEIN
WIND ENERGY FACILITY
MAP 1
LAND CAPABILITY
Capability Class
Sensitivity (Outside Field Boundaries)
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
LOW
MEDIUM
HIGH
Map Legend:
Study area
Non-perennial streams
Non-perennial rivers
Rail lines
National road
Secondary roads
Other roads
New turbine positions
Existing turbine positions
New road & overhead powerline
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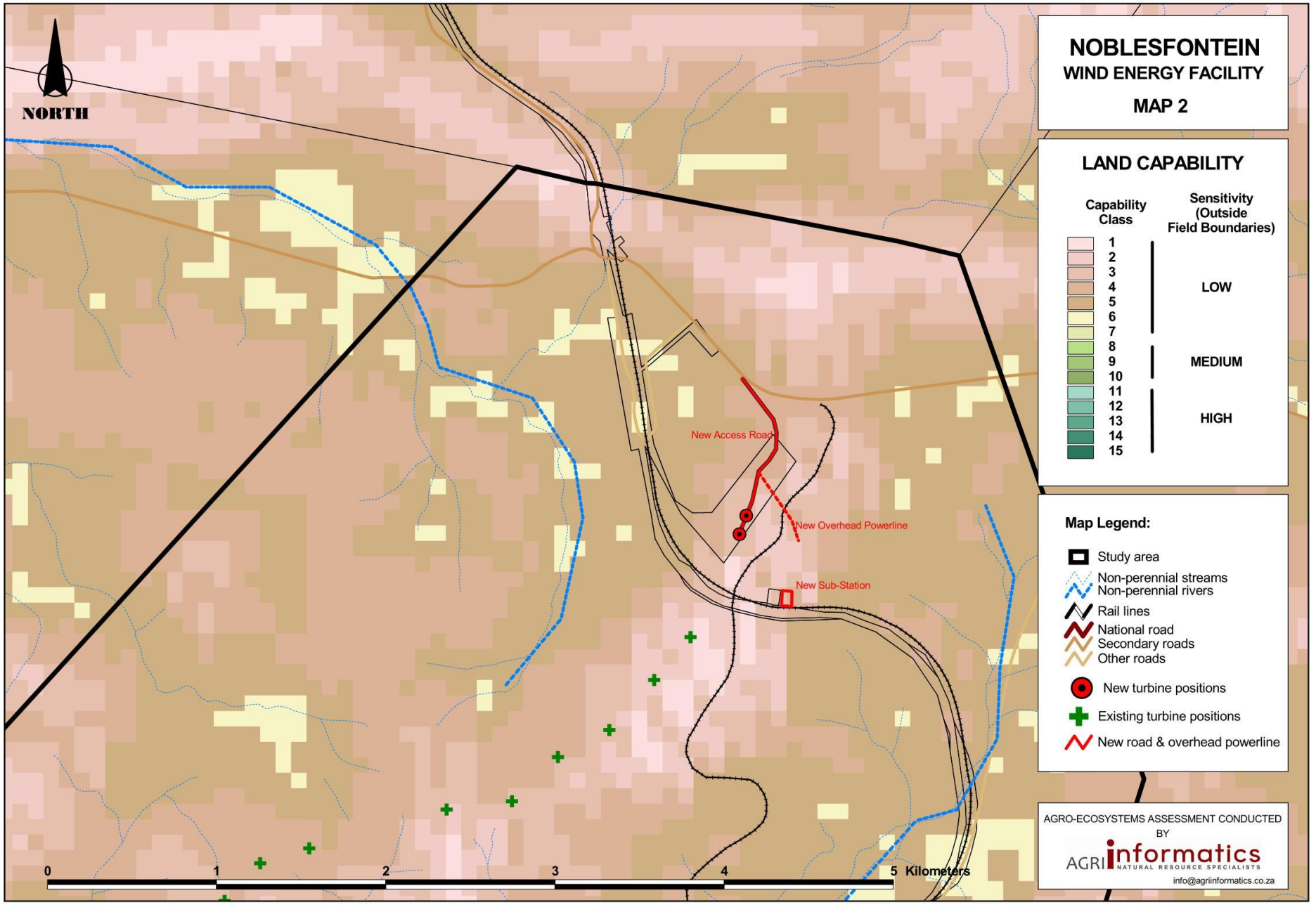
NORTH
NOBLESFONTEIN
WIND ENERGY FACILITY
MAP 2
LAND CAPABILITY
Capability Class
Sensitivity (Outside Field Boundaries)
1
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New turbine positions
Existing turbine positions
New road & overhead powerline
0
1
2
3
4
5 Kilometers
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Climate data summary

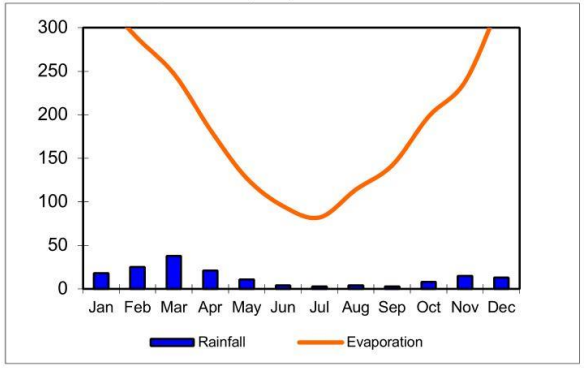
NOBLESFONTEIN WEF 31°45'S 23°16'E Altitude (approx) 1325 m Record length 30 Yrs

	Temperature °C										Degree Days above 10°C									
	Av. Mthly Days T < 0 °C	Av. Mthly Lowest Min.	Av. Mthly Min.	Av. Min. minus Lowest Min.	Daily Mean	Daily Range	Av. Mthly Max.	Av. Mthly Highest Max.	Highest Max. minus Av. Max.	Temp. Variability Index	Unadj. without Cutt-off	Unadj. with 19° Cutt-off	Adj. for Lat. & Day Length	Av. Sunshine Hours	Av. Number Rain Days	Av. Rainfall mm	Av. A-pan Evap. mm	Av. Windrun km	Av. Daily Min. % R.H.	Av. Daily Max. % R.H.
January	0.0	10.5	13.3	2.8	21.9	17.2	30.5	34.1	3.6	40.8	369	279	274	0	0.0	18	333	0	30	81
February	0.0	10.3	13.2	2.9	21.4	16.3	29.5	33.3	3.8	39.3	318	252	248	0	0.0	25	288	0	33	83
March	0.0	8.1	11.3	3.2	19.0	15.4	26.7	30.8	4.1	38.1	279	279	274	0	0.0	38	247	0	38	88
April	0.0	3.5	7.0	3.5	14.7	15.4	22.4	26.5	4.1	38.4	141	146	143	0	0.0	21	183	0	38	88
May	0.0	0.2	3.4	3.2	11.0	15.1	18.5	22.3	3.8	37.2	29	29	29	0	0.0	11	127	0	39	90
June	0.0	-2.8	0.5	3.3	8.0	14.9	15.4	18.9	3.5	36.6	-62	-62	-60	0	0.0	4	95	0	37	87
July	0.0	-3.5	-0.2	3.3	7.7	15.8	15.6	19.2	3.6	38.5	-71	-71	-70	0	0.0	3	82	0	35	87
August	0.0	-2.5	1.1	3.6	9.5	16.7	17.8	22.3	4.5	41.5	-17	-17	-17	0	0.0	4	114	0	32	82
September	0.0	0.2	4.0	3.8	12.7	17.3	21.3	26.4	5.1	43.5	80	80	78	0	0.0	3	142	0	29	78
October	0.0	3.2	7.0	3.8	15.4	16.7	23.7	28.7	5.0	42.2	166	166	163	0	0.0	8	198	0	32	82
November	0.0	6.5	9.9	3.4	18.3	16.8	26.7	31.1	4.4	41.4	249	249	245	0	0.0	15	238	0	30	78
December	0.0	9.1	11.9	2.8	20.4	17.0	28.9	32.9	4.0	40.8	322	279	274	0	0.0	13	332	0	30	80
Annual					15.0	16.2			4.1	39.9	1782	1583	1556	0	0	163	2379	0	33	84

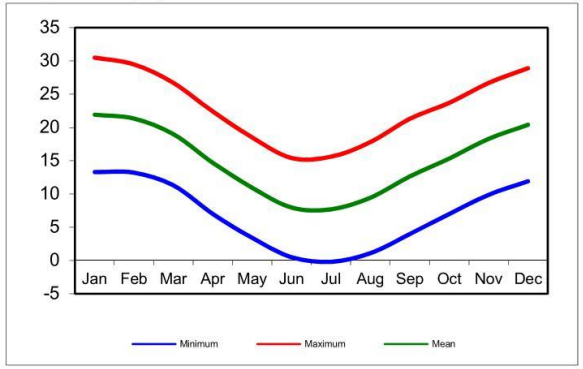
* (adapted from Gladstones, 1993)

NOTE: 1. Degree days calculated for Sep to Mar (S Hemisphere) & Apr to Sep (N Hemisphere) 2. A column of zero values is an indicaton of an element not recorded at this weather station

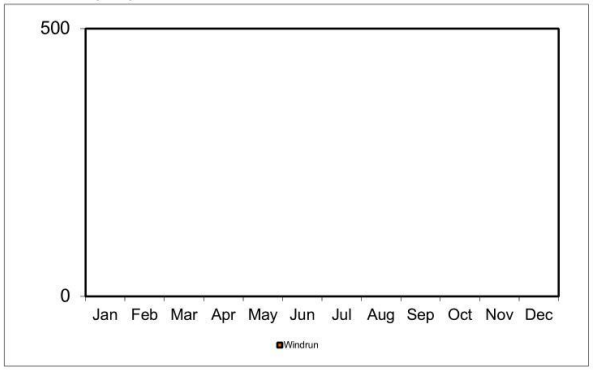
Rainfall and Evaporation (mm):



Temperature (°C):



Windrun (km):



Tonietto & Carbonneau's multicriteria climatic index:

Heliothermal Index	Cold Night Index	Dryness Index
Hot	Cold nights	Very dry
HI+2	CI+2	DI+2

Data sources: Agromet, division of ARC
FAO: Environment and Natural Resources Services
WRC: Atlas for Agro Meteorology
WDC for Meteorology; Müller & Hennings
WorldClimate.com

Data sheet compiled by ***Agri Informatics***

All data are provided free of charge. Fees apply to data processing and extraction only.