AURECON SOUTH AFRICA

Proposed construction of one 132kV Transmission Line from Longyuan Mulilo De Aar 2 North Wind Energy Facility (WEF) to Hydra Substation in De Aar, Northern Cape

Review of the Desktop Agricultural Assessment – Final Report

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Revision Number:	# 0.3
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Signature:	
For:	Aurecon South Africa

Declaration

I, Nicolaas Hanekom, declare that I –

- act as an independent specialist consultant for the Desktop Agricultural Assessment of the proposed construction of the 132kV Transmission Line from Longyuan Mulilo De Aar 2 North Wind Energy Facility (WEF) to Hydra Substation in De Aar, Northern Cape;
- do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2006;
- have and will not have any vested interest in the proposed activity proceeding;
- have no, and will not engage in, conflicting interests in the undertaking of the activity;
- undertake to disclose, to the competent authority, any material information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the Environmental Impact Assessment Regulations, 2006; and
- will provide the competent authority with access to all information at our disposal regarding the application, whether such information is favourable to the applicant or not.

Mr. Nicolaas Hanekom (*Pr. Sci. Nat.*)
Scientist
Eco Impact Legal Consulting (Pty) Ltd

AURECON SOUTH AFRICA AND LONGYUAN MULILO DE AAR 2 NORTH PTY LTD

PROPOSED CONSTRUCTION OF ONE 132KV TRANSMISSION LINE FROM THE LONGYUAN MULILO DE AAR MAANHAARBERG WIND ENERGY FACILITY TO HYDRA SUBSTATION IN DE AAR, NORTHERN CAPE

UPDATED DESKTOP AGRICULTURAL ASSESSMENT – FINAL REPORT

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1 INTRODUCTION AND BACKGROUND INFORMATION

Aurecon South Africa (Pty) Ltd (**Aurecon**) on behalf of Longyuan Mulilo De Aar 2 North (Pty) Ltd (**Longyuan Mulilo**) requested a desktop agricultural assessment for the proposed construction of a new 132kV power line, in the Northern Cape Province (**Figure 1**). This new transmission line will connect the North Wind Energy Facility project to Eskom's new Hydra Substation.

The primary objective of this desktop assessment is to provide specialist agricultural, soil and land use input for the overarching Environmental Basic Assessment Report. In order to achieve this objective, a study of the climate, soils, terrain, aspect, land capability, geology and current agricultural practices was carried out. This report serves to summarise such a study and present the relevant results, as well as outline the predicted impacts on local soil and agricultural resources.

The proposed 132kV line will run side by side with adjacent Eskom servitudes and transmission lines from the North WEF Substation to the Eskom Hydra substation. The proposed line will cross a number of agriculturally zoned farm portions which are mainly used as grazing land for sheep, goats and cattle. An assessment route corridor, with a width of 500m, has been investigated as part of this assessment (**Figure 2**). The 500m wide corridor has been proposed to allow flexibility when determining the final route alignment. In terms of Eskom standards, a single 132 kV power line will require a maximum servitude of 31m in width.

It is hoped that this assessment, along with the other specialist studies, will inform the power line routing process, and thus minimize the predicted impacts on the receiving environment.

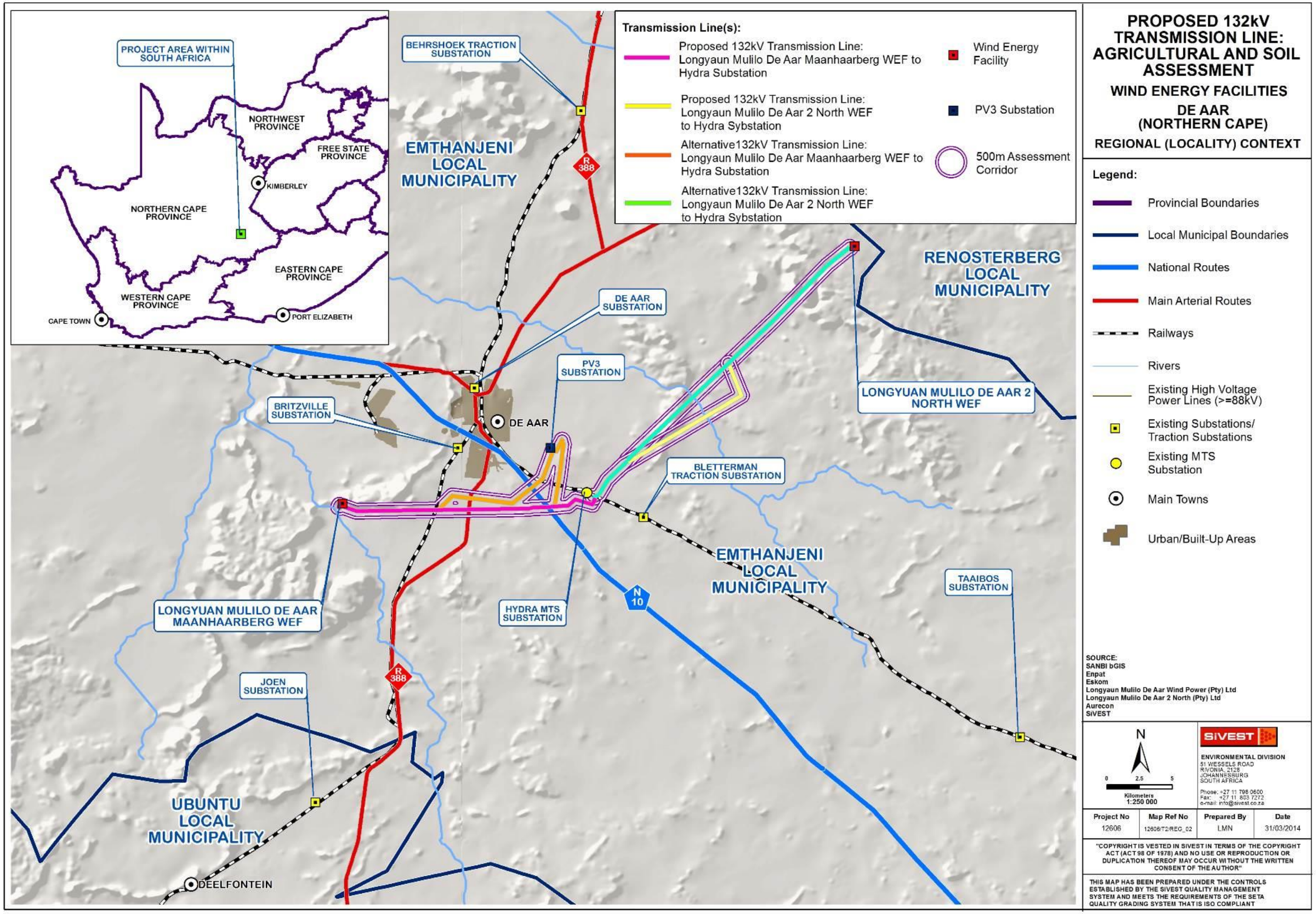

Figure 1: Locality Map

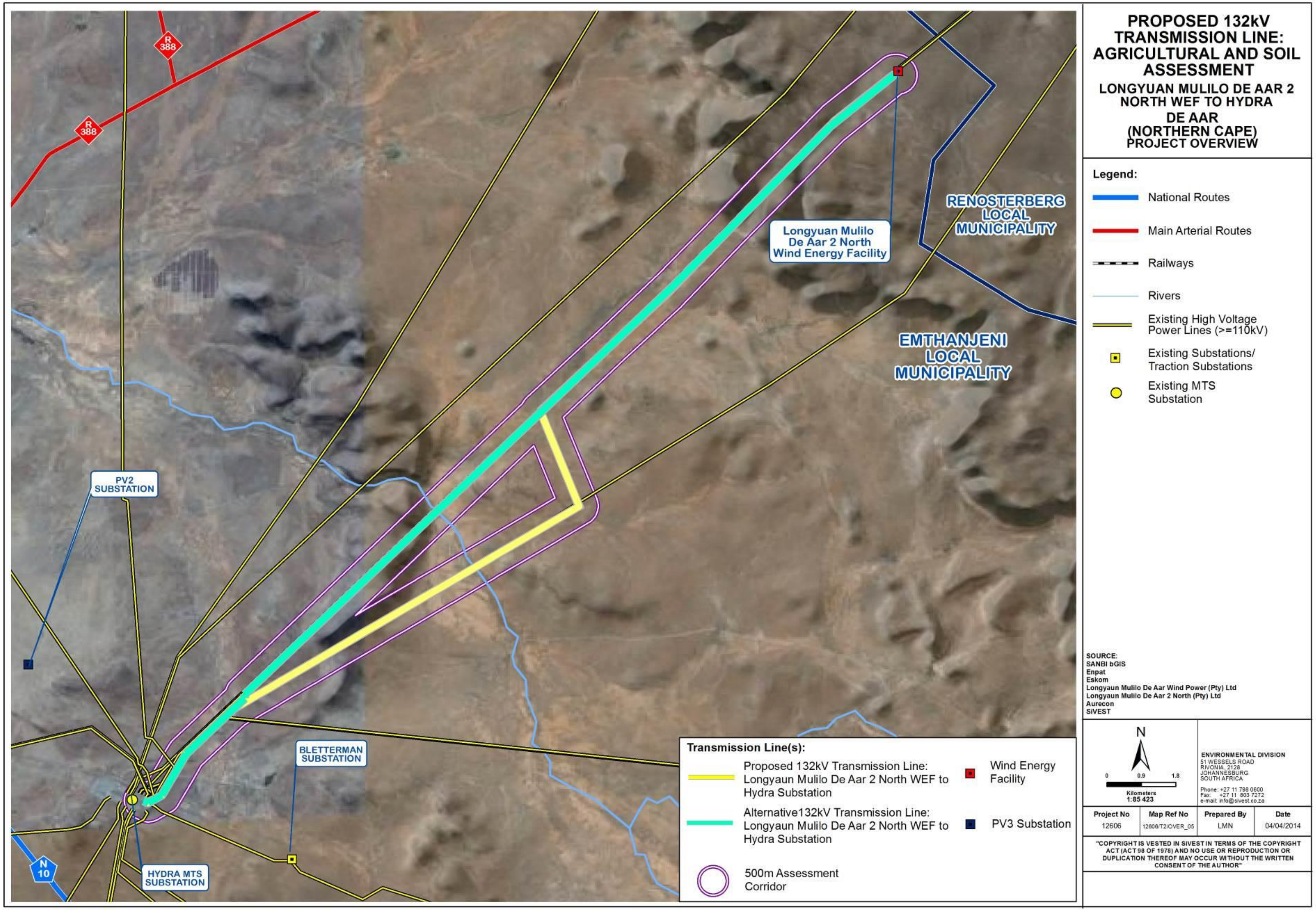

Figure 2: Project Overview Map

1.1 Study Objectives

In terms of this study, agricultural potential is described as an area's suitability and capacity to sustainably accommodate an agricultural land use, and in most cases this potential is benchmarked against crop production. Thus, the objective of this desktop study is to broadly assess the agricultural potential of the affected land by interrogating relevant climate, topographic, landuse and soil datasets. By combining these relevant data sets one is able to broadly assess the agricultural potential of the affected land.

The terms of reference for the desktop assessment are as follows:

- Source relevant baseline data. This involves the assimilation of spatially relevant GIS datasets with related attribute datasets;
- Broadly assess the soil and agricultural potential of the receiving environment, by interrogating relevant spatial and numerical climate, topographic, natural resource, economic, local agricultural practices and crop data to determine the agricultural potential and economic feasibility of the site;
- Undertake a spatial agricultural evaluation and associated mapping for the study area;
- Impact assessment and mitigation measures – a detailed soil and land use impact assessment will be complied based on the predicted impacts resulting from the proposed activities. Detailed mitigation measures will be identified and routing recommendations provided in order to minimize the impact of the proposed development on agricultural production and potential. The final recommended routing will be guided by baseline information and current agricultural value in order to avoid areas of high agricultural value.

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1.2 Assumptions and Limitations

This desktop assessment is used to identify any major agricultural impacts relating to the proposed development. It should be clearly noted that, since the spatial information used in this report are of a reconnaissance nature, only broad/large scale climate, land use and soil details are provided.

2 DESCRIPTION OF PROPOSED ACTIVITIES AND TECHNICAL DETAILS

The technical details provided in this Section are primarily extracted from previous projects and the Project Description Document produced by Aurecon (**2012**).

As previously mentioned, the De Aar 2 North sub-project encompasses the construction of one 132kV overhead transmission line. This line will connect two 140MW Wind Energy Facilities to the national transmission grid via the Eskom Hydra substation.

In terms of Eskom standards, a single 132kV power line requires a maximum servitude of 31 m in width.

The power line will consist of a series of towers located approximately 200m apart, but can vary between 250m and 375m depending on the topography and the terrain to be spanned. The exact tower type to be used will be determined (based on load and other calculations) during the final design stages of the power line. It is however likely that the Single Steel Pole tower type will be used. These poles weigh approximately 1,200kg each and vary in height from approximately 17.4 m to 21m.

The size of the footprint is dictated by the type of pole, i.e. whether it is a self-supporting, guyed suspension or an angle strain pole structure. The size of the footprint ranges from 0.6 m x 0.6 m to 1.5 m x 1.5 m, with the larger footprint associated with the guyed suspension and angle strain pole used as bend/strain structures. Self-supporting structures (suspension pole) are typically used along the straight sections of the power line, while the guyed intermediate or guyed suspension and angle strain structures are used where there is a bend in the power line alignment (**Figure 3**). The final tower sizes and positions will only be determined once the project has received Environmental Authorisation and after negotiations with landowners (**Aurecon, 2012**).

Figure 3: Proposed tower types (**Aurecon, 2012**)

3 DESKTOP AGRICULTURAL ASSESSMENT

Existing high level GIS data was sourced from National GIS Datasets as well as the Environmental Potential Atlas for South Africa (ENPAT) Database for the Northern Cape Province of South Africa, compiled by the Department of Environmental Affairs and Tourism (**DEAT**, **2001**). The main purpose of ENPAT is to proactively indicate potential conflicts between development plans and critical, endangered or sensitive environments. By combining various data sources one is able to broadly assess the line alternatives, receiving environment, and its ability to accept change, in the form of development. More agriculturally relevant spatial information was obtained from the AGIS Database (***http://www.agis.agric.za,*** accessed 13/12/2012).

3.1 Climate

The study area has a semi-arid to arid continental climate with a summer rainfall regime i.e. most of the rainfall is confined to summer and early autumn. Mean Annual Precipitation (MAP) is approximately 300mm per year. An MAP of 300mm is deemed low, as 500mm is considered the minimum amount of rain required for sustainable dry land farming (**Figure 4**). Thus, without some form of supplementary irrigation natural rainfall for the study area is insufficient to produce sustainable harvests. This is reflected in the lack of dry land crop production within the study area. De Aar typically experiences hot days and cold nights with the highest maximum temperature of approximately 40°C and the lowest minimum temperature of approximately - 8°C (**Table 1** and **Figure 5**). Evaporation is estimated to be in the region of 2,000mm per annum and thus the area is subjected to very severe moisture availability restrictions (**AGIS, 2012**)

In summary the climate for the study area is severely restrictive to arable agriculture which is primarily due to low, unpredictable and seasonal rainfall along with severe moisture availability restrictions.

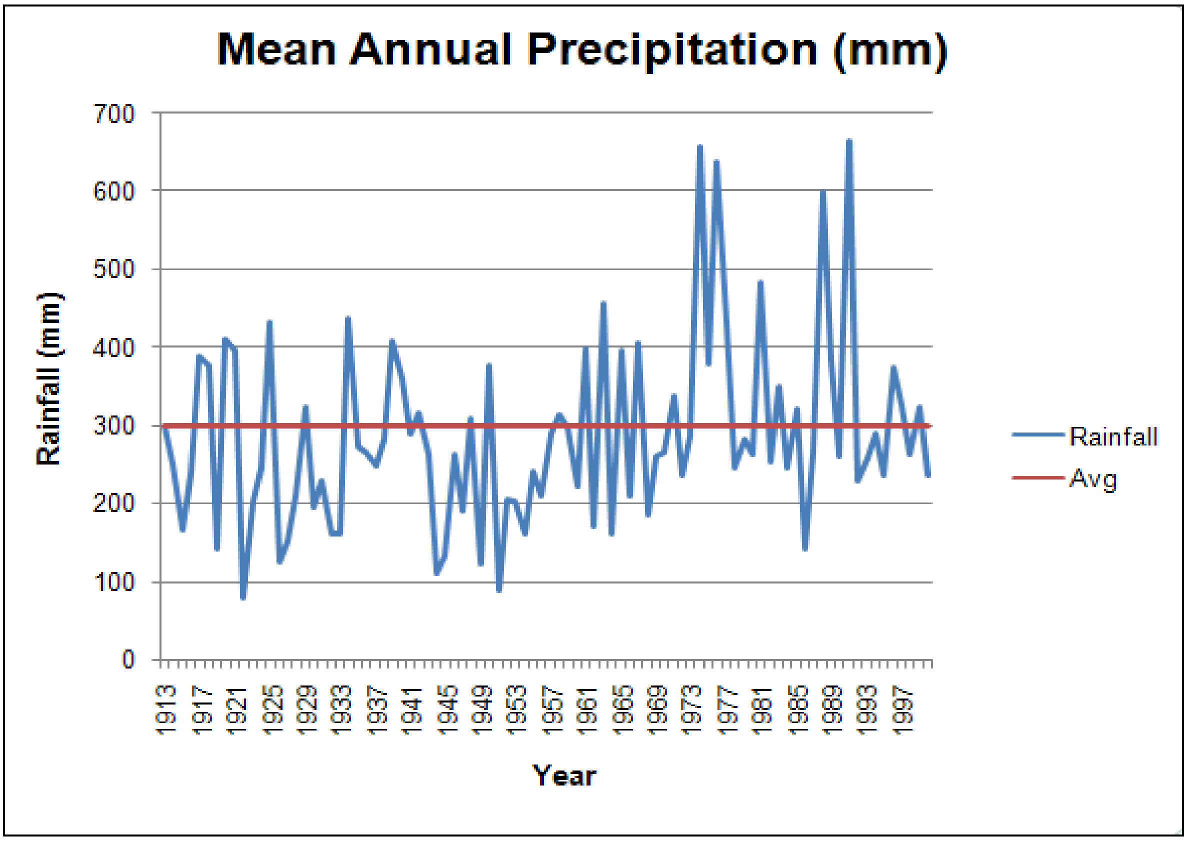

Figure 4: Long term annual rainfall (1913 – 1998) for the study area and long term average (indicated by the red line) (Source: **SAWS, 2010**)

Table 1: Monthly Temperature Table for De Aar (**SAWS, 2010**)

Month	**Temperature (°C) (1961 – 1990)**			
	Highest Recorded	**Average Daily Maximum**	**Average Daily Minimum**	**Lowest Recorded**
January	40	32	16	7
February	38	31	15	4
March	37	28	13	1
April	34	24	9	-1
May	30	20	4	-5
June	26	16	1	-7
July	25	17	1	-8
August	28	19	2	-8
September	35	23	6	-5
October	36	26	9	-3
November	38	29	12	-1
December	39	31	14	3
Year	**40**	**25**	**9**	**-8**

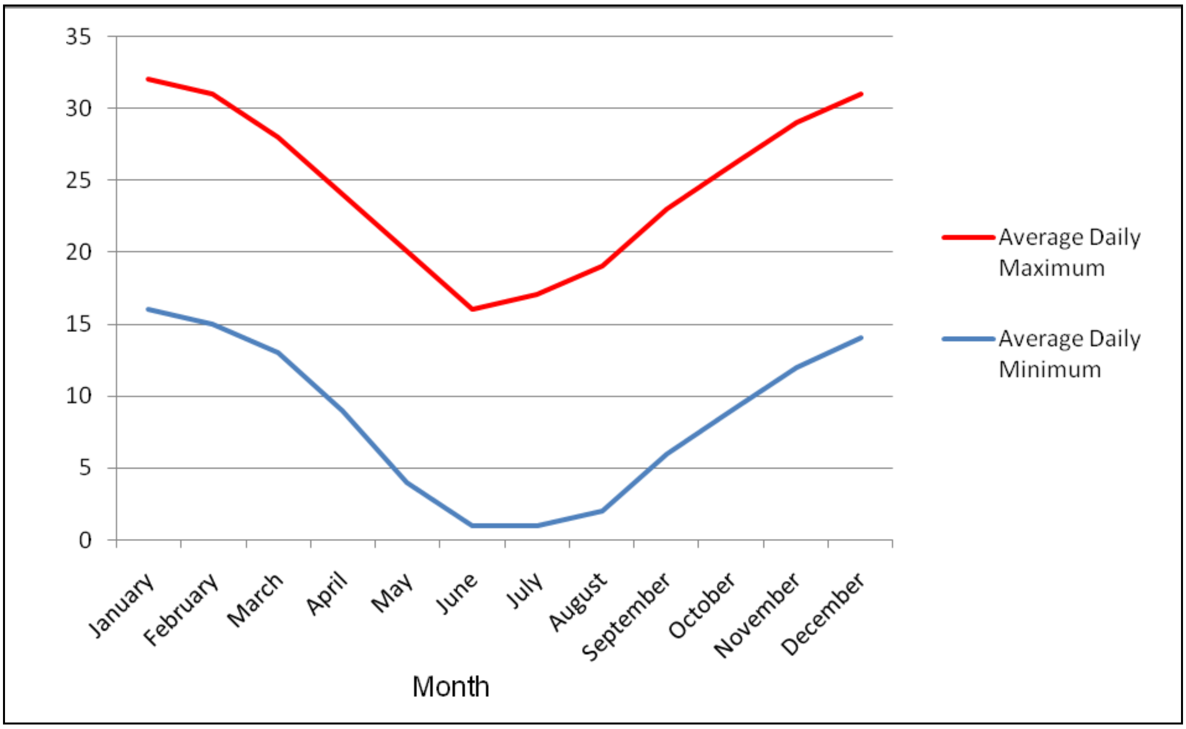

Figure 5: Average Daily Minimum and Maximum Temperatures for De Aar **(SAWS, 2010)**

3.2 Geology

The study area is underlain by a variety of geological materials including dolerite, mudstone and shale (**Figure 6**). Dolerite, a basic igneous rock dominates the eastern and central-western areas of the power line corridor, which coincides with the top of the plateau and high spots.

Shale and mudstone geologic materials are found on the plains which surround the plateau, and dominate the central and southern study areas. Shale, a clastic sedimentary rock, is formed by the settling and accumulation of clay rich minerals and other sediments. Due to the settling process this parent material usually takes the form of parallel rock layers which lithifies over time.

The new avoidance alignment associated with the line is predominately underlain by mudstone. Like shale, mudstone is also clastic sedimentary rock which is formed from the lithification of deposited mud and clay. Mudstone consists of a very fine grain size of less than 0.005mm, but unlike shale it is mostly devoid of bedding.

The Alternative transmission line route is located primarily on land with the same geology as the preferred transmission line route. Hence, the same findings apply to the Alternate route.

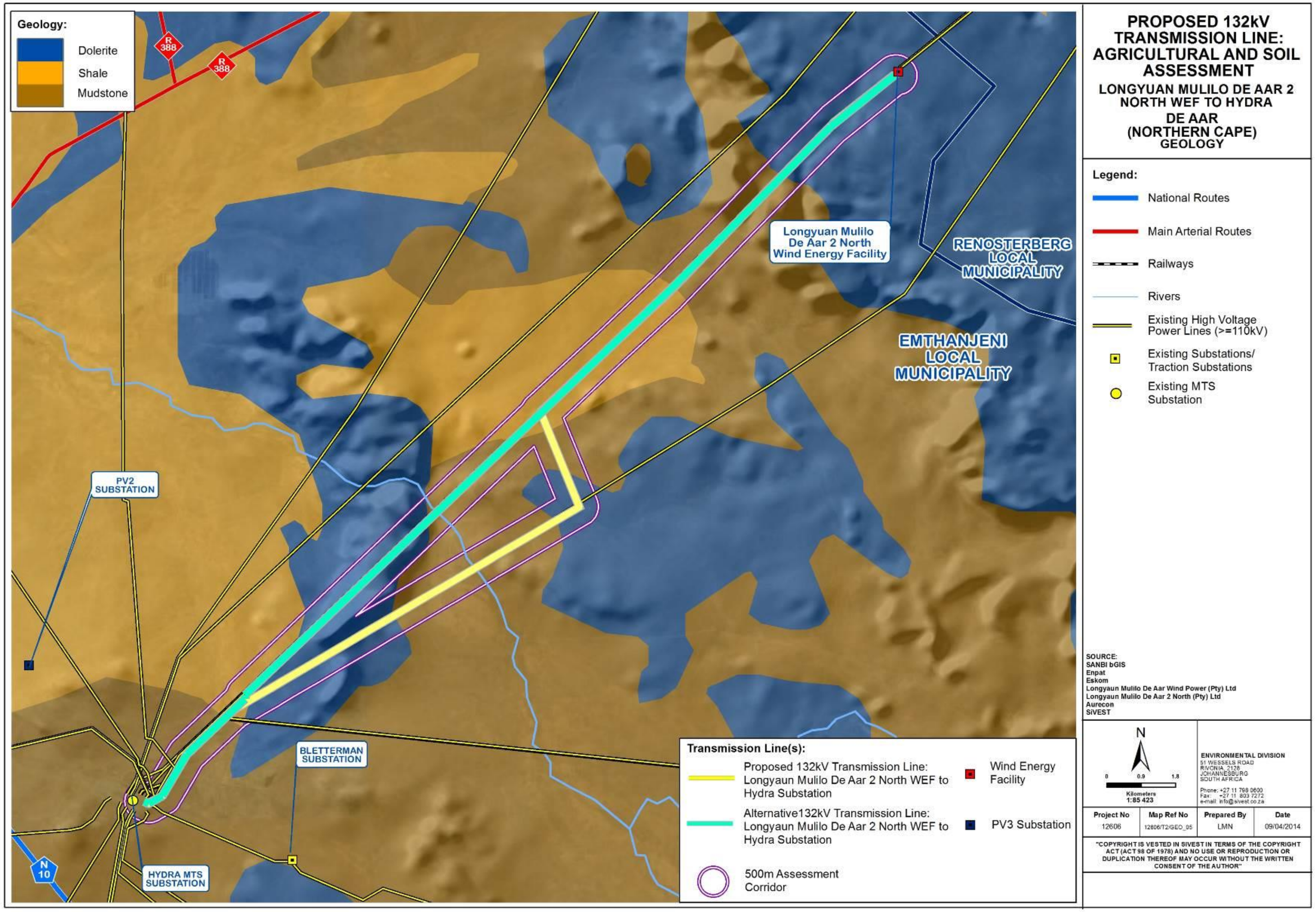

Figure 6: Geological Map

3.3 Slope

Slope or terrain is used to describe the lie of the land. Terrain influences climate and soils characteristics, and thus plays a dominant role in determining whether land is suitable for agriculture. In most cases sloping land is more difficult to cultivate, and usually less productive, than flatland, and is subject to higher rates of water run-off and soil erosion (**FAO, 2007**).

The steep cliffs, which divide the flat lower plains with the more undulating plateau, are the most prominent topographical feature. Away from these cliffs the study area is generally flat with an average gradient of less than 10% (**Figures 7** and **8**) making these areas ideal for intensive agriculture with high potential for large scale mechanisation.

The Alternative transmission line route is located on terrain with the same slopes as the preferred transmission line route, however, a larger portion of it is positioned on the flat lower plains. Hence, very similar findings apply to the Alternate route.

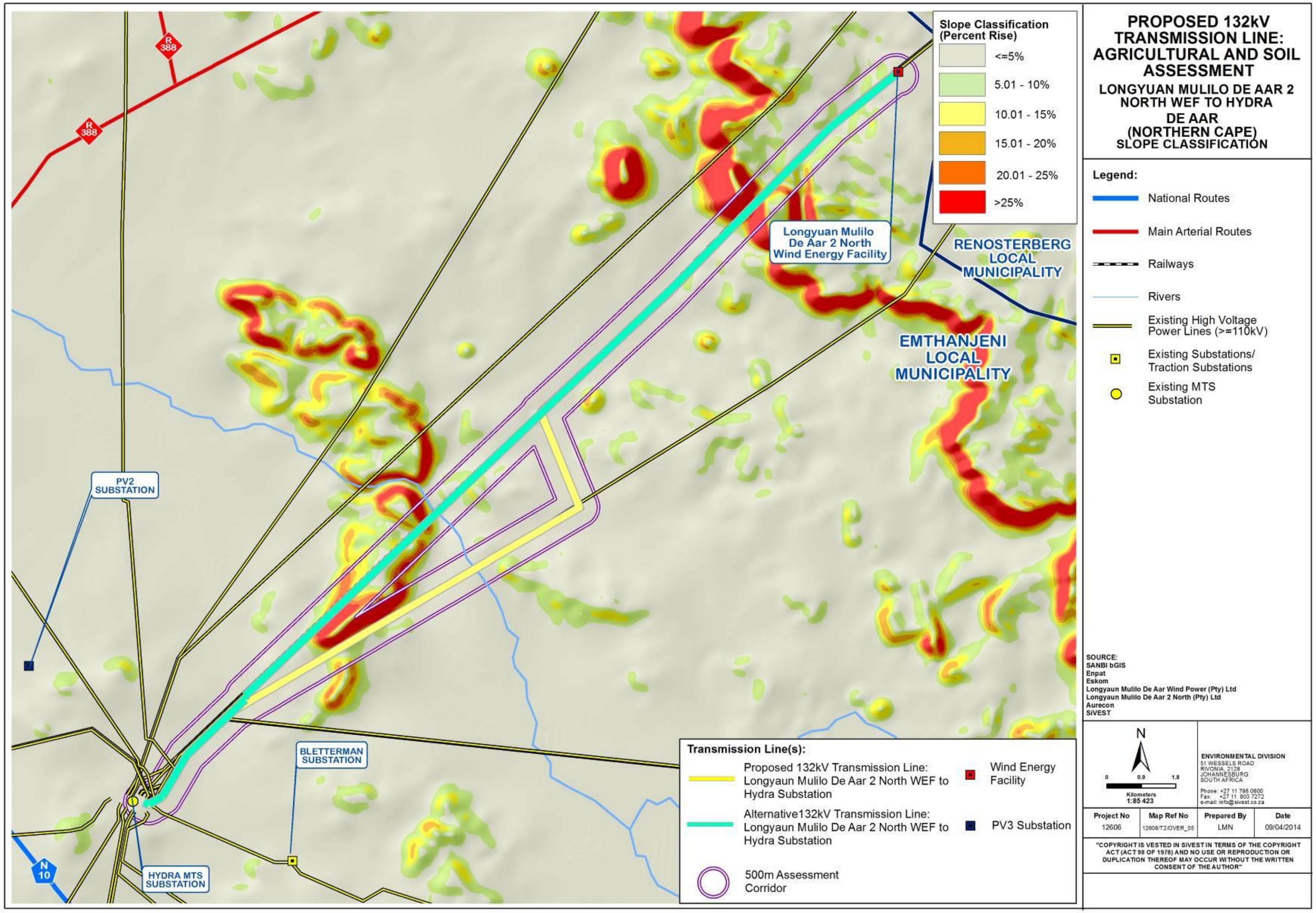

Figure 7: Slope Map

Figure 8: Flat plains (foreground) of the central power line routing, with steeper slopes giving rise to the eastern plateau (background)

3.4 Land Use

According to **Mucina** and **Rutherford** (**2006**) the Eastern Plateau and associated high spots are classified as Besemkaree Koppies Shrubland, while the lower plains are dominated by the Northern Upper Karoo vegetation type. The study area consists of a mix of natural veld and vacant land which is used as general grazing land for livestock (**Figures 9** and **10**).

According to the ENPAT Database and 2010 land cover data the study area consists of a mix of natural veld and unimproved shrubland which is used as grazing land for sheep, goats and cattle. Vast un-improved grazing land is interspersed by non-perennial stream beds and seasonal pans dot the landscape. According to the spatial databases there are no cultivated fields or irrigated lands which could be detrimentally impacted upon by the proposed development corridor alternatives.

The Alternative transmission line route is located on land with the same land use classification as the preferred transmission line route. Hence, the same findings apply to the Alternate route.

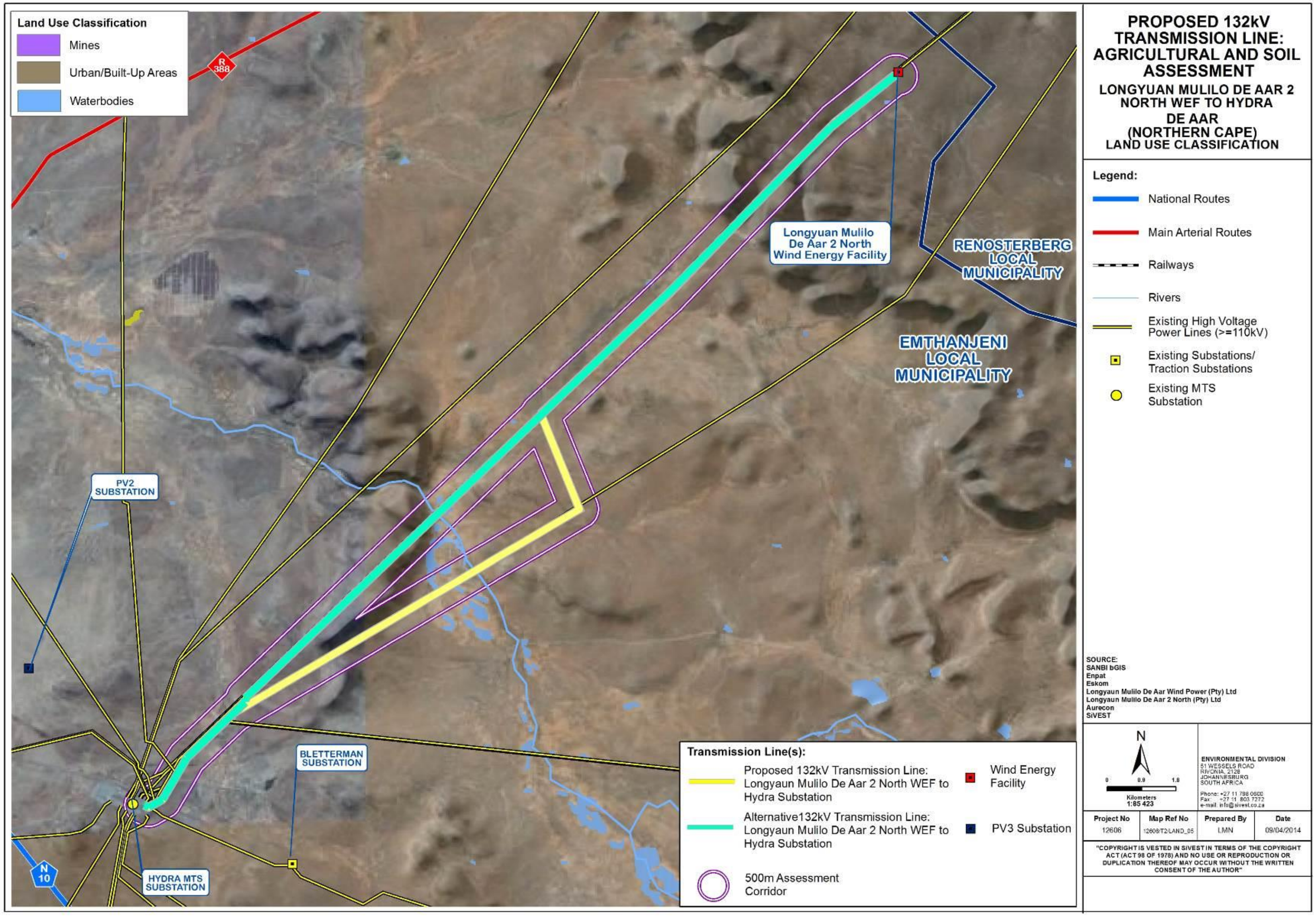

Figure 9: Land Use Map


Figure 10: A large flock of sheep grazing on central plains, with the plateau in the background

3.5 Soil Characteristics and Soil Potential

The ENPAT spatial dataset for the Northern Cape Province provides details pertaining to the broad soil type and approximate agricultural potential for the study area. **Figure 11** provides a spatial characterization of the major soil groups which underlie the study area. This characterization allows the study area to be divided into two broad soil group areas.

The study area is characterized by a mix of rocky areas in combination with Glenrosa and Mispah soil forms. These forms are associated with shallow soils, where parent rock is found close to the land surface. These soils have an inherently low agricultural potential due to a prohibitive rooting depth. As expected shallow, rocky soils correspond to the steeper slopes which give rise to the eastern plateau.

The entire study area is classified as having an effective soil depth, depth to which roots can penetrate the soil, of less than 0.45 m deep which is a limiting factor in terms of sustainable crop production (**Figure 12**). According to the AGIS database the project area is associated with soils with a low organic matter content and an average pH of between 7.5 and 8.4 (basic).

The ENPAT Database also provides an overview of the study area's agricultural potential based on its soil characteristics, although it should be noted this spatial dataset does not take *prevailing climate into account*.

The central portion of the study area contains soils which are poorly suited to arable agriculture, but remain suitable to grazing and forestry (where climate permits). The majority of the eastern and western portion of the study area contains soils which are not suitable for arable agriculture, but remain suitable to grazing and forestry (where climate permits). Small elements of the western and eastern portions of the study area, on the steeper slopes, contain soils which are not suitable for agriculture, and are only suitable for conservation, recreation and water catchment (**Figure 12**).

A severely restrictive climate rating, due to low rainfall and moisture / heat stress dramatically reduces the agricultural potential of the project area.

The Alternative transmission line route is positioned in soils with the same groups, depths and potential as the preferred transmission line route. A larger percentage of it is located on the Glenrosa/Mispah form, with a larger percentage of the study area containing soils which are not suitable for arable agriculture, but remain suitable to grazing and forestry (where climate permits). Hence the same findings apply.

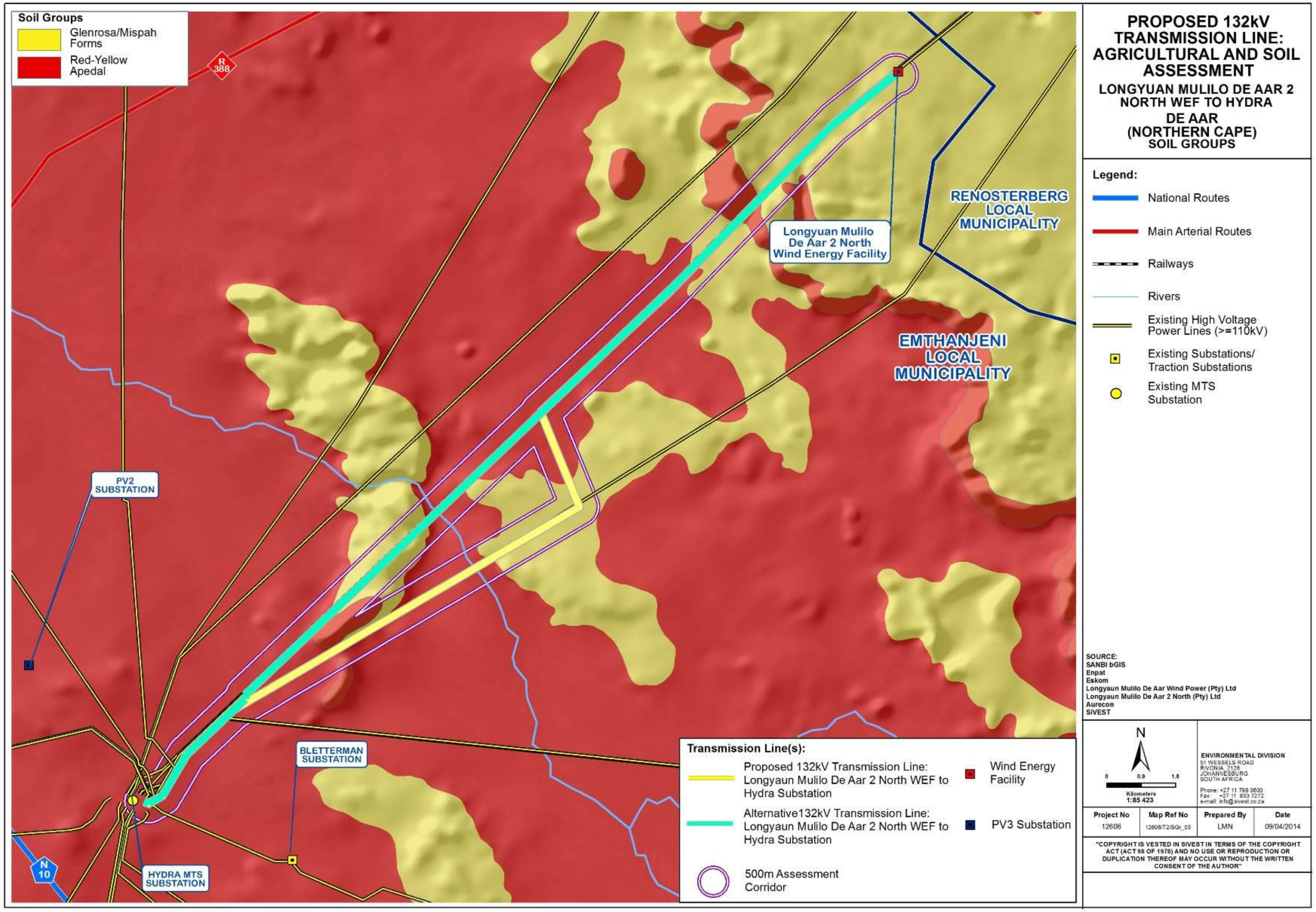

Figure 11: Soil Group Map

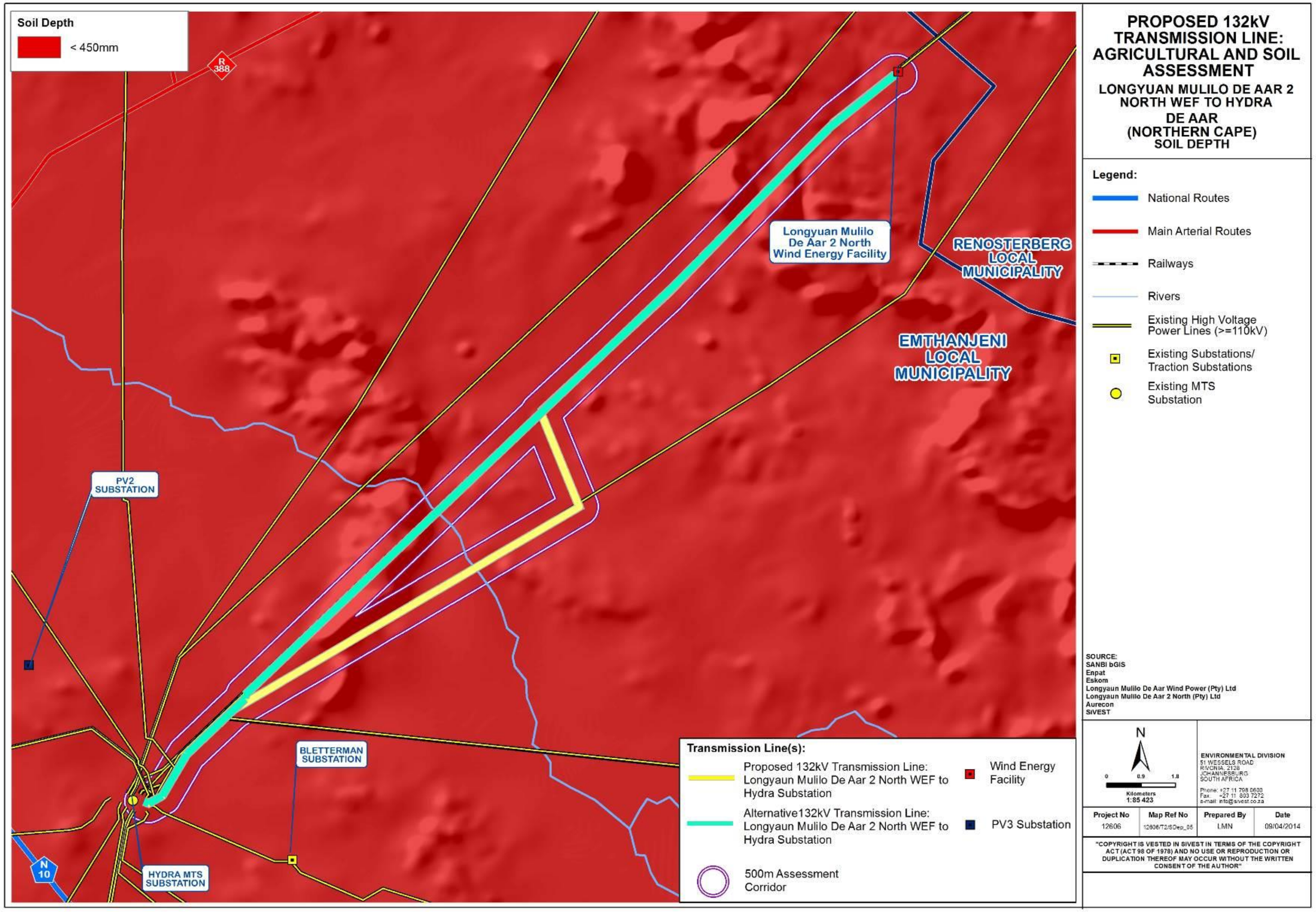

Figure 12: Soil Depth Map

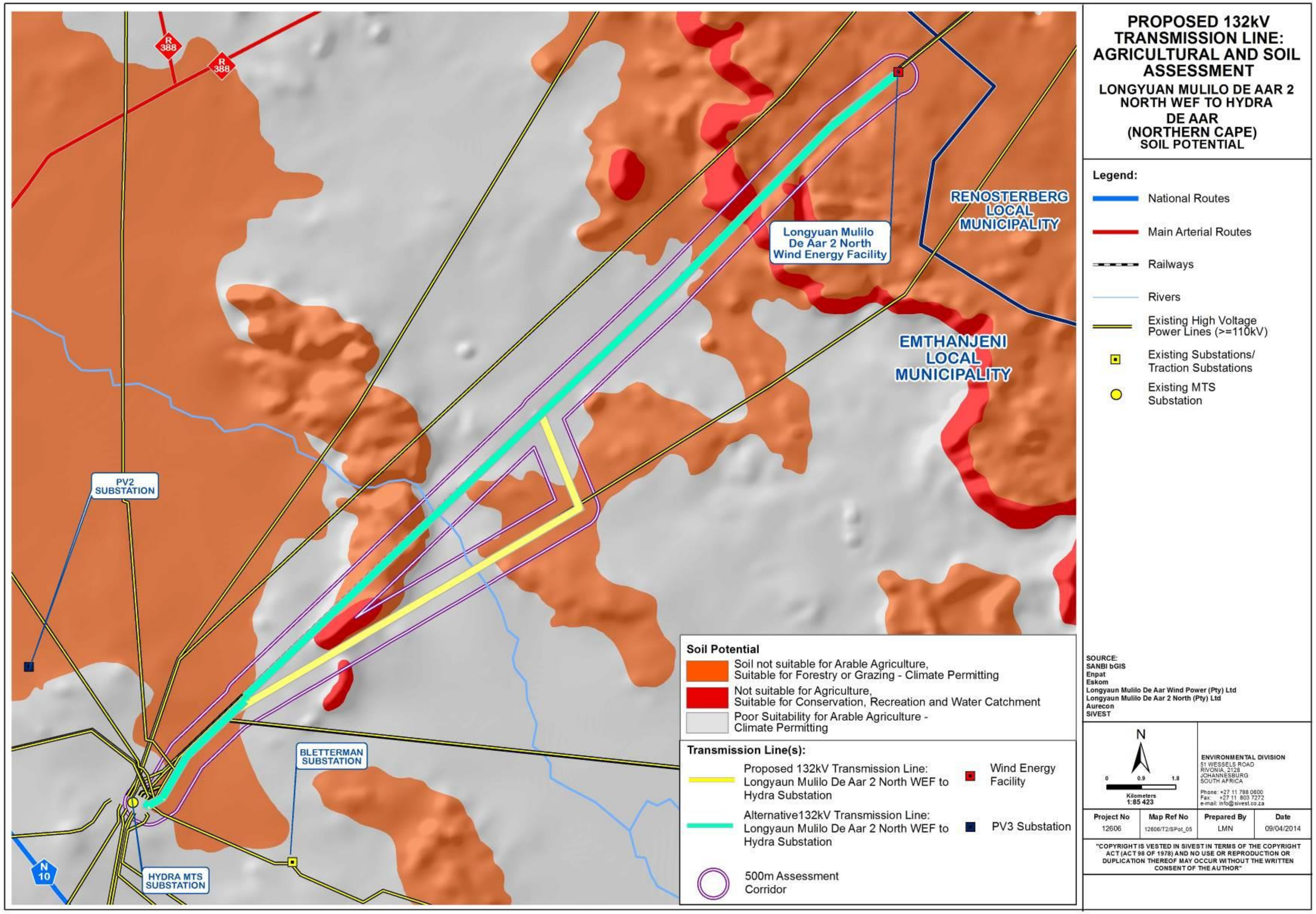

Figure 13: Soil Potential Map

3.6 Desktop Agricultural Assessment: Result Summary

By taking all the corridor characteristics (climate, geology, land use, slope and soils) into account the agricultural potential for the majority of the study area is classified as being extremely low for crop production while moderate to moderately low for grazing. The grazing carrying capacity for the general area within which the corridor is situated is 26-30 animal units per hectare. The power line will not have a significant reduction of animal unit carrying capacity due to the fact that only the pole footprint will impact on vegetation and grazing plant material. This poor agricultural potential rating is primarily due to restrictive climatic characteristics and soil depth limitations.

The generally poor soils and restrictive climate characteristics are reflected in the lack of active agricultural fields within the provided assessment corridor. The steeper slopes, giving rise to the eastern plateau, are not suitable for agriculture, grazing or forestry due to rocky soils and extreme topography. The affected area is not classified as high potential nor is it a unique dry land agricultural resource.

4 IMPACT ASSESSMENT

The primary aim of the initial impact study is to highlight problematic areas and 'no-go zones', in terms of agricultural production and potential. In terms of this study, agricultural potential is described as an area's suitability and capacity to sustainably accommodate an agricultural land use, and in most cases this potential is benchmarked against crop production. The desktop assessment (**Section 3**) has already shown that the proposed area is unsuitable for sustainable crop production and is dominated by unimproved grazing land.

The proposed development's primary impact on agriculture will involve the construction of one 132 kV transmission line on agricultural land.

4.1 Proposed Transmission Line

The land influenced by the 500m power line corridors is classified, at best, as moderate potential grazing land. This grazing land is classified as a non-sensitive land use in terms of agricultural production when assessed within the context of the proposed development. This is due to the fact that livestock grazing, the dominant agricultural activity; can continue within the power line servitude. The only loss of grazing land will be under the towers themselves, which is also minimized by the proposed monopole tower design. This direct <u>loss of agricultural land is considered inconsequential</u> within the context of this assessment.

There are no centre pivots, irrigation schemes or active agricultural fields which will be influenced by the proposed developments, and as such, there are no fatal flaw areas for the assessment corridor.

In terms of line routing, there is no significant variance between agricultural characteristics within the width of 500 m corridors and as such, from an agricultural perspective, the line may be routed anywhere within the selected corridor.

According to Article 7(3)b of Regulation 9238 of the Conservation of Agricultural Resources Act, Act 43 of 1983, no land user shall utilize the vegetation in a vlei, marsh or water sponge or within the flood area of a water course or within 10 meters horizontally outside such flood area in a manner that causes or may cause the deterioration of or damage to the natural agricultural resources. Care must therefore be taken that the power line poles footprint be placed outside these drainage lines and a 10 meters horizontally line outside them in order to prevent damage to vegetation that may result in the impact on the surrounding agricultural resources.

4.2 Determination of Significance of Impacts

Significance is determined through a synthesis of impact characteristics which include the context and the intensity of an impact. Context refers to the geographical scale (i.e. site, local, national or global), whereas Intensity is defined by the severity of the impact (e.g. the magnitude of deviation from background or baseline conditions, the size of the area affected, the duration of the impact and the overall probability of occurrence). Significance is calculated as per the example shown in **Table 4**. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact.

4.3 Impact Rating Methodology

Impact assessments must take account of the nature, scale and duration of effects on the environment whether such effects are positive (beneficial) or negative (detrimental).

4.3.1 Rating System Used To Classify Impacts

The rating system is applied to the potential impact on the receiving environment and includes an objective evaluation of the mitigation of the impact. Impacts have been consolidated into one rating. In assessing the significance of each issue, the following criteria (including an allocated point system) is used:

NATURE		
Include a brief description of the impact of environmental parameter being assessed in the context of the project. This criterion includes a brief written statement of the environmental aspect being impacted upon by a particular action or activity.		
GEOGRAPHICAL EXTENT		
This is defined as the area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales and as such bracketing ranges are often required. This is often useful during the detailed assessment of a project in terms of further defining the determined.		
1	Site	The impact will only affect the site
2	Local/district	Will affect the local area or district
3	Province/region	Will affect the entire province or region
4	International and National	Will affect the entire country
PROBABILITY		
This describes the chance of occurrence of an impact		
1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).

2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between a 50% to 75% chance of occurrence).
4	Definite	Impact will certainly occur (Greater than a 75% chance of occurrence).
REVERSIBILITY		
This describes the degree to which an impact on an environmental parameter can be successfully reversed upon completion of the proposed activity.		
1	Completely reversible	The impact is reversible with implementation of minor mitigation measures.
2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
4	Irreversible	The impact is irreversible and no mitigation measures exist.
IRREPLACEABLE LOSS OF RESOURCES		
This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity.		
1	No loss of resource	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resources	The impact will result in significant loss of resources.
4	Complete loss of resources	The impact is result in a complete loss of all resources.
DURATION		
This describes the duration of the impacts on the environmental parameter. Duration indicates the lifetime of the impact as a result of the proposed activity		
1	Short term	The impact and its effects will either disappear with mitigation or will be mitigated through natural process in a span shorter than the construction phase (0 – 1 years), or the impact and its effects will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).
2	Medium term	The impact and its effects will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter (10 – 50 years).
4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered transient (Indefinite).

CUMULATIVE EFFECT		
This describes the cumulative effect of the impacts on the environmental parameter. A cumulative effect/impact is an effect which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from other similar or diverse activities as a result of the project activity in question.		
1	Negligible Cumulative Impact	The impact would result in negligible to no cumulative effects
2	Low Cumulative Impact	The impact would result in insignificant cumulative effects
3	Medium Cumulative impact	The impact would result in minor cumulative effects
4	High Cumulative Impact	The impact would result in significant cumulative effects
INTENSITY / MAGNITUDE		
Describes the severity of an impact		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact alters the quality, use and integrity of the system/component but system/ component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
3	High	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.
4	Very high	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired (system collapse). Rehabilitation and remediation often impossible. If possible rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.
SIGNIFICANCE		
Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. This describes the significance of the impact on the environmental parameter. The calculation of the significance of an impact uses the following formula: **(Extent + probability + reversibility + irreplaceability + duration + cumulative effect) x magnitude/intensity.** The summation of the different criteria will produce a non weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.		
Points	**Impact Significance Rating**	**Description**
6 to 28	Negative Low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
6 to 28	Positive Low impact	The anticipated impact will have minor positive effects.
29 to 50	Negative Medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
29 to 50	Positive Medium impact	The anticipated impact will have moderate positive effects.

51 to 73	Negative High impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
51 to 73	Positive High impact	The anticipated impact will have significant positive effects.
74 to 96	Negative Very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
74 to 96	Positive Very high impact	The anticipated impact will have highly significant positive effects.

4.3.2 Impact Summary

Once rated, the impacts are summarised and a comparison made between pre- and post-mitigation phases. The rating of environmental issues associated with different parameters prior to, and post, mitigation of a proposed activity will be averaged. A comparison is then made to determine the effectiveness of the proposed mitigation measures and identify critical issues related to the environmental parameters.

a) Planning Phase

Loss of agricultural land and / or production is not envisioned during this phase of the project.

b) Construction and Operational Phases: 132 kV Transmission Lines

Due to the nature of the development, the construction and operational phases have been combined for this particular impact.

Table 2: Impact rating table for construction and operation of a 132 kV Transmission Lines

IMPACT TABLE: Transmission Lines	
Environmental Parameter	***Soil and agricultural potential***
Issue/Impact/Environmental Effect/Nature	***Loss of agricultural land and / or production as a result of the proposed construction of the 132kV transmission lines***
Extent	***Local / District****:* Will affect the local area or district
Probability	***Definite****: Due to tower construction a small loss of grazing land will definitely occur.*
Reversibility	***Completely Reversible****: The land can be returned to grazing after construction is complete.*
Irreplaceable loss of resources	***Marginal Loss****: The construction of the towers and associated infrastructure will result in a very marginal loss of agricultural land.*
Duration	***Long Term****: The impact and its effects will continue or last for the entire operational life of the development.*
Cumulative effect	**Negligible Cumulative Impact**
Intensity/magnitude	***Low***
Significance Rating	**The anticipated impact will have negligible negative effects and will require little to no mitigation.**

	Pre-mitigation impact rating	Post mitigation impact rating
Extent	2	2
Probability	4	4
Reversibility	1	1
Irreplaceable loss	2	2
Duration	3	3
Cumulative effect	1	1
Intensity/magnitude	1	1
Significance rating	-13 (**low negative**)	-13 (**low negative**)
Mitigation measures	▪ Due to the overarching site characteristics, and the nature of the proposed development, viable mitigation measures are limited and will most likely revolve around erosion control: ➢ Clearing activities should be kept to a minimum. ➢ In the unlikely event that heavy rains are expected, activities should be put on hold to reduce the risk of erosion. ➢ If additional earthworks are required, any steep or large embankments that are expected to be exposed during the 'rainy' months should be armoured with fascine like structures. A fascine structure usually consists of a natural wood material and is used for the strengthening of earthen structures or embankments. ▪ If earth works are required then storm water control and wind screening should be undertaken to prevent soil erosion. ▪ Interact with landowners to discuss where they would ideally like to see the power lines situated on their property. ▪ Ensure adequate compensation is paid to land owners where necessary. ▪ No pole structures are placed within drainage lines and their 10 meter buffer areas.	

c) Decommissioning phase

Loss of agricultural land and / or production is not envisioned during this phase of the project.

4.4 Agricultural Impact Summary

An agricultural impact summary is provided in **Table 3**. If the recommended mitigation measures are implemented, the predicted impacts, as a result of the proposed activities, will be low.

Table 3: Agricultural Impact Summary Table

Environmental parameter	**Issues**	**Rating prior to mitigation**	**Average**	**Rating post mitigation**	**Average**
Soil and agricultural potential	*Loss of agricultural land and / or production as a result of the proposed construction of the 132kV transmission lines*	13		13	
			- 13		**-13**
			Low Negative Impact		Low Negative Impact

4.5 Preferred Alternative

One alternative transmission line alignment was proposed, with only over half the western portion of the line deviating in a easterly, and then northerly direction, before joining the preferred line route.

In essence, this Alternative line has an almost identical impact as the preferred route, with the similar soil and land-use characteristics. Hence the agricultural impacts of this alternate route will be very similar to the preferred route. However, it covers a larger area due to its greater length, and therefore has a greater impact on the ecology.

Consequently, the preferred route is the more recommended of the two, although the difference in impact between them is minimal.

5 SUMMARY AND RECOMMENDATIONS

Aurecon South Africa on behalf of Longyuan Mulilo De Aar 2 North (Pty) Ltd requested a review of the desktop agricultural assessment for the proposed construction of a new 132 kV power line, in the Northern Cape Province. It is intended that this new transmission line will service the planned renewable energy projects which surround the town of De Aar. This document assesses De Aar 2, which consists of a 132kV overhead transmission line which will connect the Wind Energy projects on the Eastern Plateau to the Eskom Hydra substation.

By taking all the corridor characteristics (climate, geology, land use, slope and soils) into account the agricultural potential for the majority of the study area is classified as being extremely low for crop production while moderate to moderately low for grazing. This poor agricultural potential rating is primarily due to restrictive climatic characteristics and soil depth limitations.

The generally poor soils and restrictive climate characteristics are reflected in the lack of active agricultural fields within the 500m assessment corridor. The steeper slopes, giving rise to the eastern plateau, are not suitable for agriculture, grazing or forestry due to rocky soils and extreme topography. The affected area is not classified as high potential nor is it a unique dry land agricultural resource.

The land influenced by the 500m power line corridors is classified, at best, as moderate potential grazing land. This grazing land is classified as a non-sensitive land use in terms of agricultural production when assessed within the context of the proposed development. This is due to the fact that livestock grazing, the dominant agricultural activity; can continue within the power line servitude. The only loss of grazing land will be under the towers themselves, which is also minimized by the proposed monopole tower design. This direct loss of agricultural land is considered inconsequential within the context of this assessment. Care must therefore be taken that the power line poles footprint be placed outside drainage lines and a 10 meters horizontally line outside them in order to prevent damage to vegetation that may result in the impact on the surrounding agricultural resources. Alternative A (Transmission Line) is recommended as it runs parallel to an existing Eskom servitude and transmission lines that already impact on the agricultural activities on site.

There are no centre pivots, irrigation schemes or active agricultural fields which will be influenced by the proposed developments, and as such, there are no fatal flaw areas for the assessment corridor.

In terms of line routing, there is no significant variance between agricultural characteristics within the width of 500 m corridor and as such, from an agricultural perspective, the lines may be routed anywhere within the selected assessment corridor.

The anticipated impacts from the proposed developments will have negligible negative effects, and will require little to no mitigation. A full agricultural assessment should not be necessary unless the reconnaissance nature of this desktop report is found to have not described the pertinent site characteristics, or potential impacts, sufficiently.

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