environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF THE SPECIALIST, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

	(For official use only)
File Reference Number:	
NEAS Reference Number:	DEA/EIA/
Date Received:	

Application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

PROJECT TITLE

Ndau 2 Solar Energy Facility

Kindly note the following:

1. This form must always be used for applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting where this Department is the Competent Authority.
2. This form is current as of 01 September 2018. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at https://www.environment.gov.za/documents/forms.
3. A copy of this form containing original signatures must be appended to all Draft and Final Reports submitted to the department for consideration.
4. All documentation delivered to the physical address contained in this form must be delivered during the official Departmental Officer Hours which is visible on the Departmental gate.
5. All EIA related documents (includes application forms, reports or any EIA related submissions) that are faxed; emailed; delivered to Security or placed in the Departmental Tender Box will not be accepted, only hardcopy submissions are accepted.

Departmental Details

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Physical address:
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473 Steve Biko Road
Arcadia

Queries must be directed to the Directorate: Coordination, Strategic Planning and Support at:
Email: EIAAdmin@environment.gov.za

1. SPECIALIST INFORMATION

Specialist Company Name:	MVB Consulting			
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	Contribution level (indicate 1 to 8 or non-compliant)	Contribution level (indicate 1 to 8 or non-compliant)	Contribution level (indicate 1 to 8 or non-compliant)
Specialist name:	Marius van Biljon			
Specialist Qualifications:	PHD Geohydrology			
Professional affiliation/registration:	SACNASP Registration No. 400177/13			
Physical address:	2 Gelding Estate, Foal Str, Ruimsig, Roodepoort			
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2. DECLARATION BY THE SPECIALIST

I, _Marius van Biljon_____, declare that –

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Signature of the Specialist

MVB Consulting

Name of Company:

04/07/2023

Date

3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, _Marius van Biljon___, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

Signature of the Specialist

MVB Consulting

Name of Company

04/07/2023

Date

Signature of the Commissioner of Oaths

17 JUL 2023

Date

Administering oath complied with the regulations contained in Government Gazette No. R1258 of July 1972, as amended

Signature:

COMMISSIONER OF OATHS (RSA)
J. L. van BILJON
Ex Officio - MTP (SA)

65 Elevation Ave
Randjesfontein
Midrand

SAIT no: 23740374
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17 JUL 2023

Luhlaza

Advisory and Consulting

GEOHYDROLOGICAL DESKTOP INVESTIGATION OF THE PROPOSED NDAU SOLAR FARM LOCATED BETWEEN MOKOPANE AND POLOKWANE, POLOKWANE LOCAL MUNICIPALITY, LIMPOPO PROVINCE

20 SEPTEMBER 2022

Prepared for: **AFZELIA**

Compiled by:
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Luhlaza Advisory and Consulting (Pty) Ltd
Reg. 2016 / 073744 / 07

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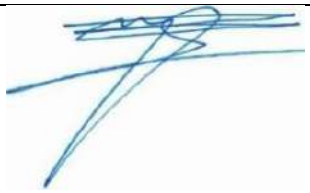
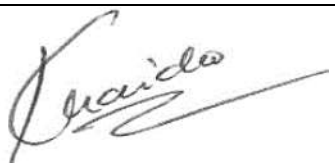
15 SEPTEMBER, 2022

Approval of Document		
Date:	**15 September 2022**	
Reference:		
Professional Name	**SACNASP No**	**Signature**
Molla Demlie **Pr. Sci. Nat.** **Specialist Geohydrology**	**400297/11**	
Kumendrie Naidoo **Pr. Sci. Nat.** **MSc Mining Engineering**	**400080/2000**	

1. TERMS OF APPOINTMENT

Luhlaza Advisory and Consulting (Pty) Ltd were requested by Praxos 373 (Pty) Ltd to provide specialist services on geohydrological impact assessment for the proposed Ndau Solar Farms located between Mokopane and Polokwane, Thabazimbi Local Municipality in Limpopo Province.

This Desktop geohydrological investigation has been carried out according to standard practice codes and guidelines as indicated in the South African National Standards (SANS) 10299:2003, titled "*Development, Maintenance and Management of Groundwater Resources*".

2. BACKGROUND INFORMATION

According to the Terms of Reference (ToR) dated 28 July 2022, the proposed Ndau Solar Farm is one of the Solar Farms where the Ndau and Nyala Solar PV is planning to apply for environmental authorisations for the establishment of a combination of Solar PV Farms and associated infrastructure across two sites clusters, i.e. Ndau and Nyala located in Limpopo province. It is understood that the Ndau site is made up of 3 properties over an approximate area of 1110.49 ha. Furthermore, it is proposed that the Ndau will consist of up to 2 Solar PV Farms.

A specialist geohydrological investigation is required to determine possible impacts of the Solar Farm project in the Ndau site may have on geohydrological aspects of the site and surrounding areas. Additionally, the investigation is required to assess the likelihood and severity of these impacts (directly, indirectly and cumulatively), both before and after mitigation measures have been applied.

Therefore, the objective of this Geohydrological desktop investigation is to undertake a geohydrological impact assessment on the entire Ndau site and provide a sensitivity assessment report from a geohydrological perspective of the project.

3. EXISTING INFORMATION

The following information are used to assist with this geohydrological Desktop investigation:

a) A kml file showing the proposed site boundaries supplied by the Client.

b) Council for Geoscience Geological Map of Polokwane at a scale of 1:250 000.

c) Department of Water and Sanitation Polokwane Hydrogeological Map Sheet at a scale of 1:500 000.

d) Land use map of the Republic of South Africa published in 2018

e) National Groundwater Archive of the Department of Water Affairs and sanitation (DWS).

f) Geohydrological Information from the National Groundwater Resources Assessment Project (GRAII)

4. METHODOLOGY FOR SITE WORK

The methodology for this portion of the investigation comprised a review of the available information for the site from existing geological and hydrogeological maps and data bases.

5. SITE DESCRIPTION

The proposed Ndau Solar farm Site is located between Mokopane and Polokwane, Polokwane Local Municipality in Limpopo province, South Africa as shown in Figure 1. The site is located within the quaternary catchments of A71A and A61F. Generalized land use map of the area is shown in Figure 2.

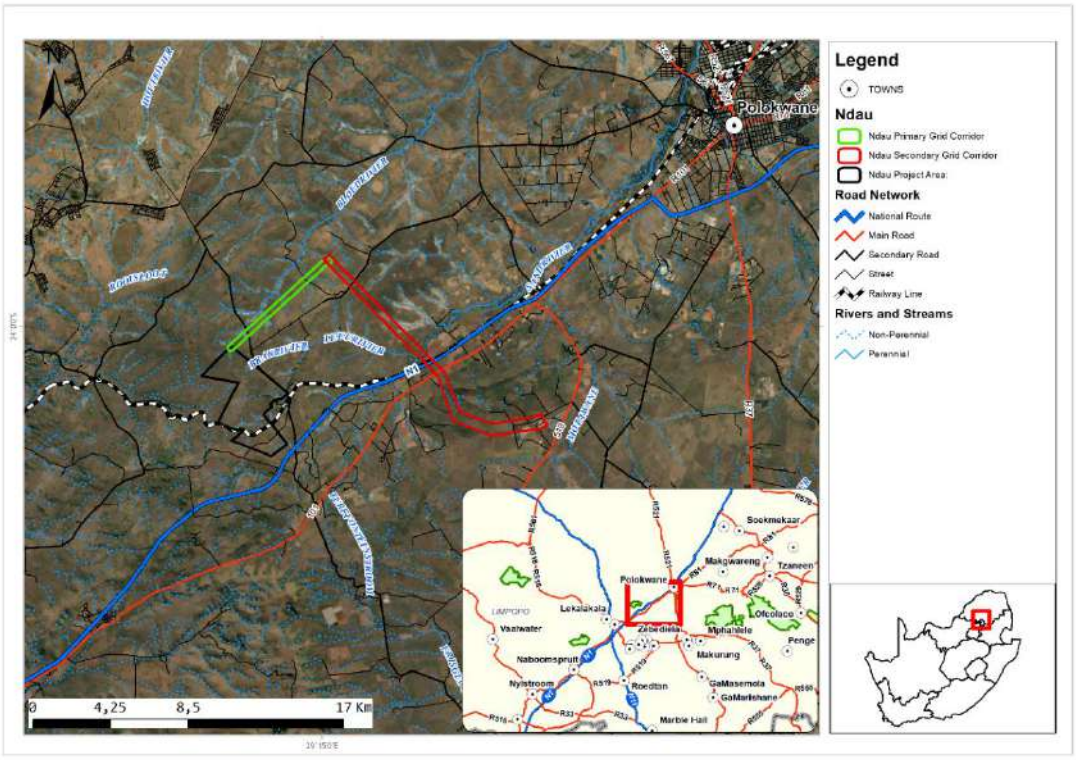


Figure 1: Locality map of the Ndau study site

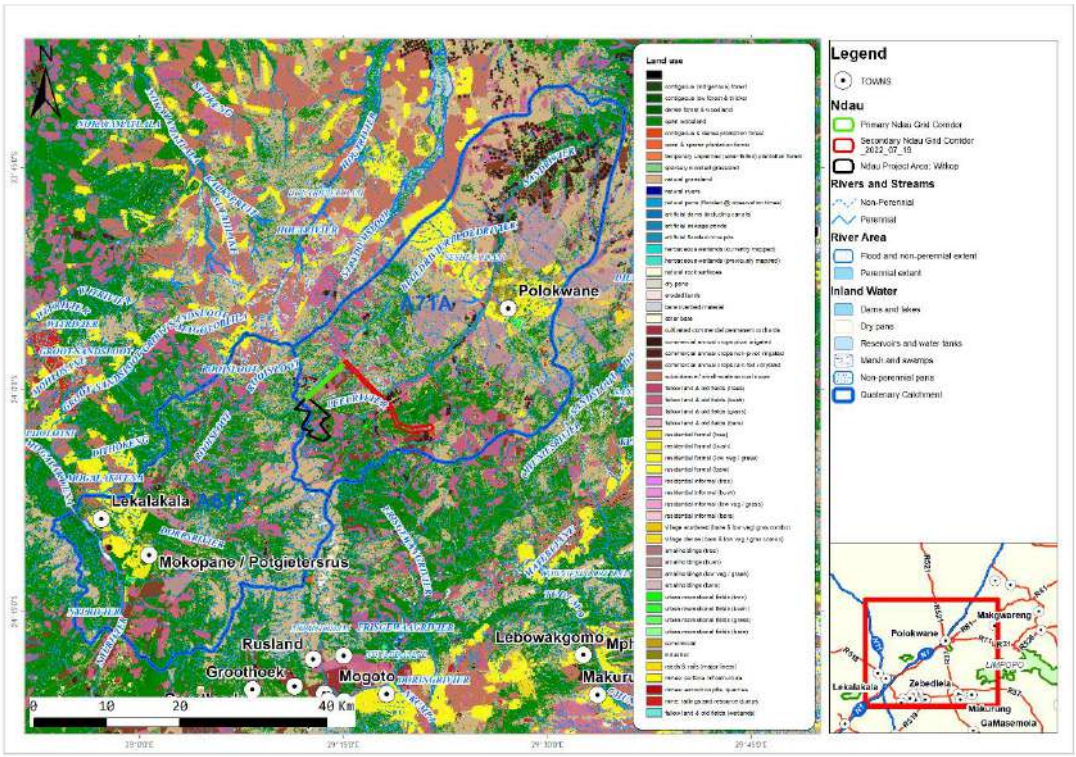


Figure 2: land use map of the region around the Ndau site (Modified from SANLC, 2018)

6. GEOLOGICAL DESCRIPTION OF THE SITE

According to the Geological Map shown in Figure 3, the surface geology in the immediate vicinity of the Ndau site is characterised by predominantly meta-arenaceous rocks (quartzite, gneiss, migmatite, granulite) and meta-argillaceous rocks (slate, phyllite, meta-pelite, schist, serpentine, amphibolite, hornfels). However, as one moves further out from the site, acid/intermediate/alkaline intrusive rocks including granitoids occur.

Figure 3 shows the local surface geology within and around the Ndau study site.

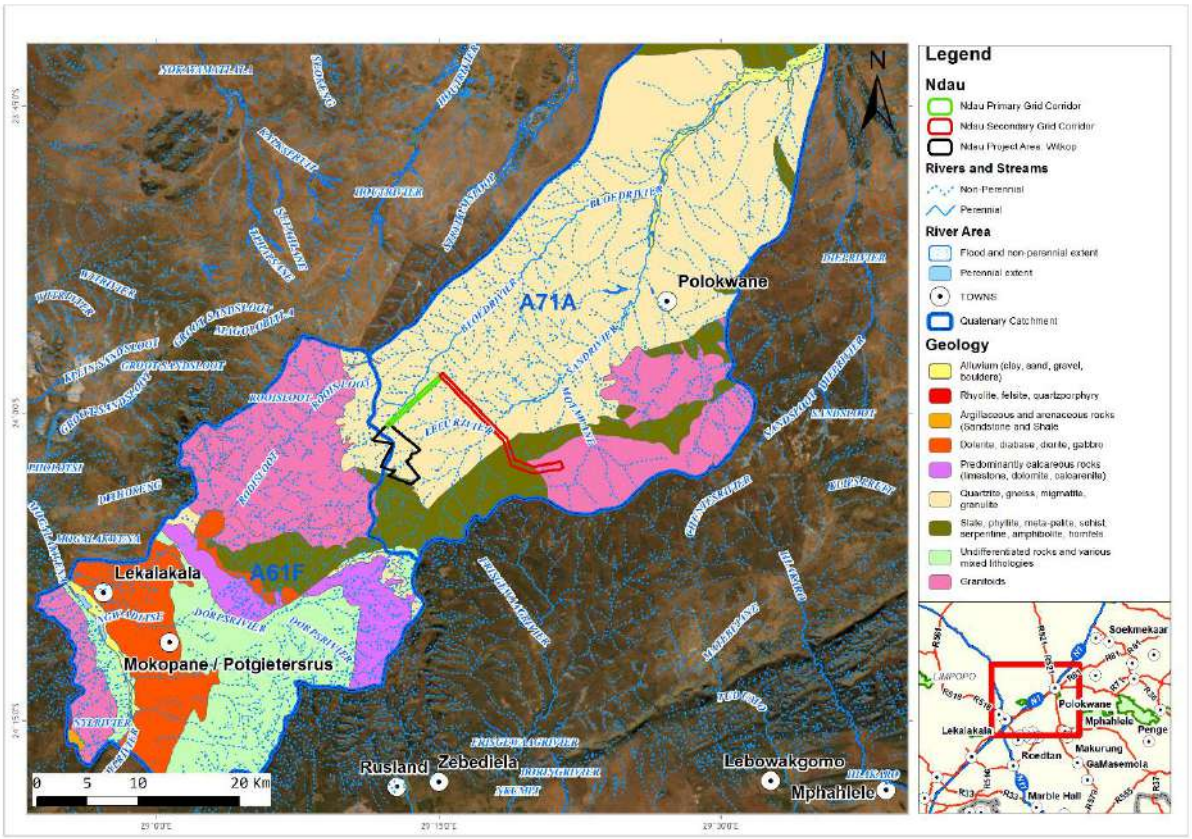


Figure 3: Local geological map of the Ndau study site and its surroundings.

7. HYDROGEOLOGICAL DESCRIPTION OF THE SITE

According to the Hydrogeological Map Series of Polokwane as shown in Figure 4, most of the footprint areas of the Ndau study site is underlain by intergranular and fractured aquifer system with an approximate yield of 5 l/s which can be described as a highly productive aquifer. Areas to the south and west of the site is characterised by intergranular and fractured aquifers with borehole yields ranging from 0.5 to 2 l/s and 0.1 to 0.5 l/s, respectively falling within the moderately productive and poorly productive aquifers (Figure 4).

The high yield of boreholes in the predominantly meta-arenaceous rocks (quartzite, gneiss, migmatite, granulite) are interesting as it is uncommon for these type of rocks with recharge rates estimated for the two quaternary catchments in which the Ndau site occurs, namely A71A and A61F have average recharge rates that vary from 13.9 mm/year for the A71A to 27.9 mm/year for the A61F quaternary catchment (GRAII data), which is low. Furthermore, the average rainfall for the two quaternary catchment is about 532 mm/year.

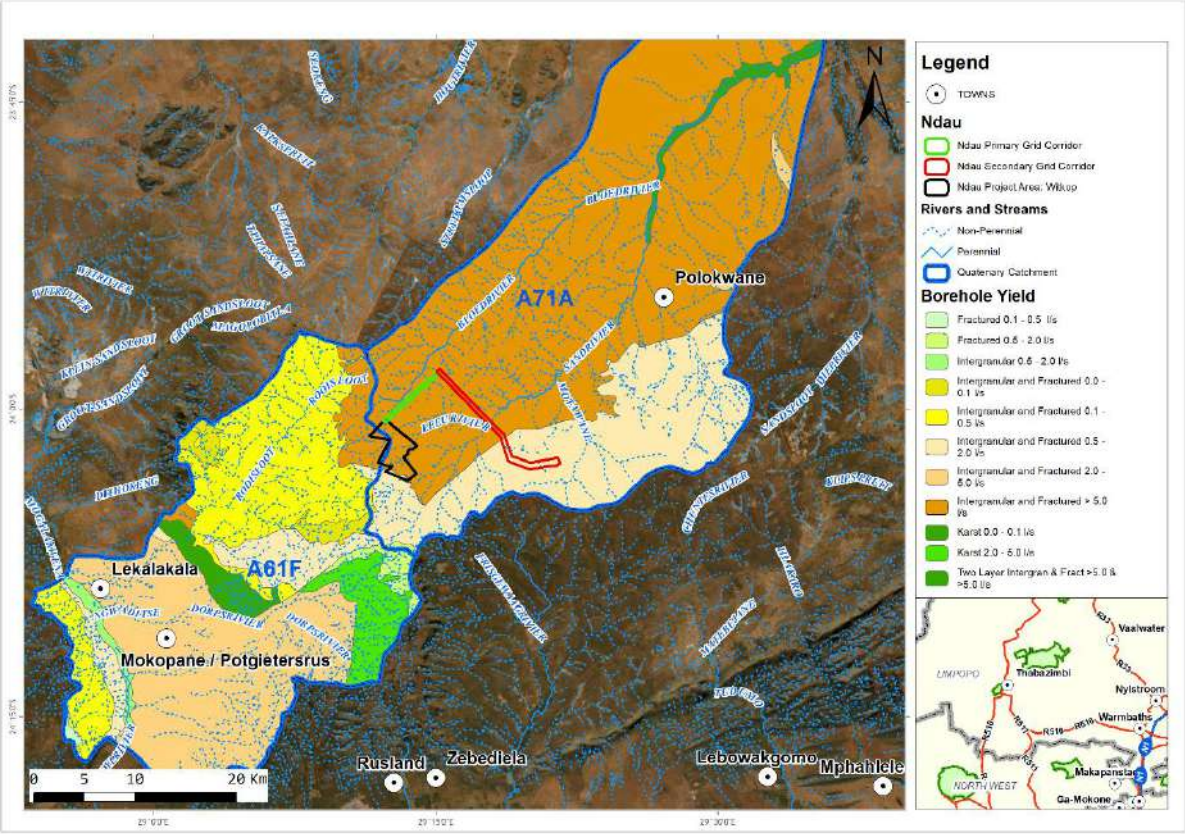


Figure 4: Hydrogeological Map of the Ndau site as modified from the Polokwane sheet Hydrogeological map.

The drainage map of the Ndau site is presented in Figure 5. The site is located at the local surface water drainage divide of the two-quaternary catchments (Figure 5). Assuming that the local groundwater level follows the local topographic gradient as expected in most areas, the Ndau site is also located on the groundwater divide. This implies that any pollution that will happen at the site will pollute downstream water resources, both groundwater and surface water resources. As such case must be taken to avoid any pollutant release during the construction, and operation of the Solar Farm and its related infrastructure.

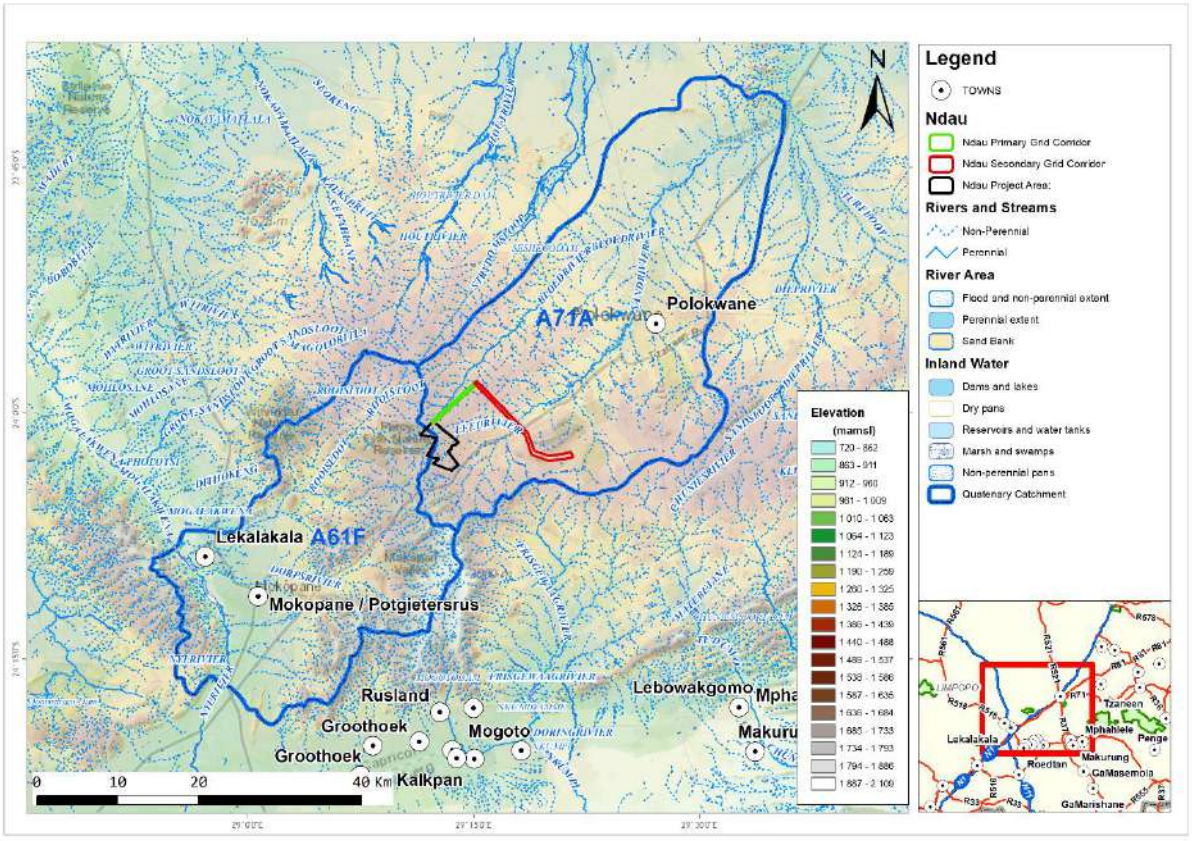


Figure 5: Drainage map of the area around the Ndau sites

Based on the Hydrological Aquifer types and drainage patterns around the project area, Ndau is classified by low to moderate sensitivity (Figure 6).

The national groundwater quality map (Figure 7) indicates that the approximate general groundwater quality in the area based on electrical conductivity (EC) values is between mainly between 70 to 300 mS/m but some areas show EC values between 0 and 70 mS/m which is generally indicative of a mixed moderate to good groundwater quality.

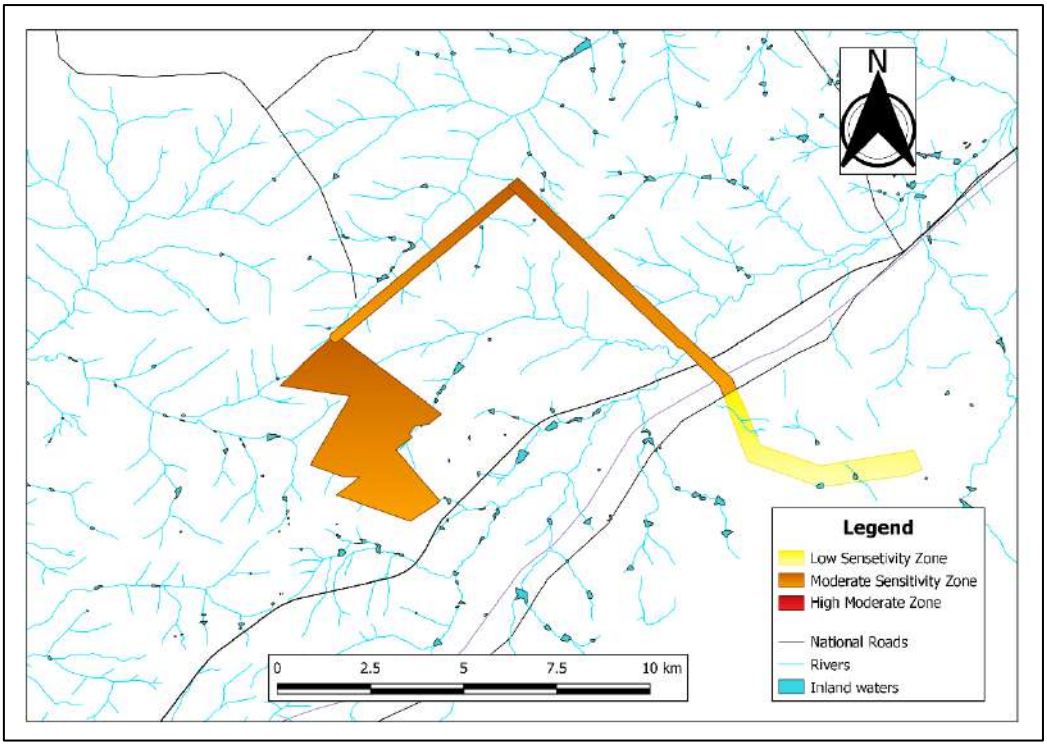


Figure 6: Groundwater Aquifer Sensitivity Map for Ndau site

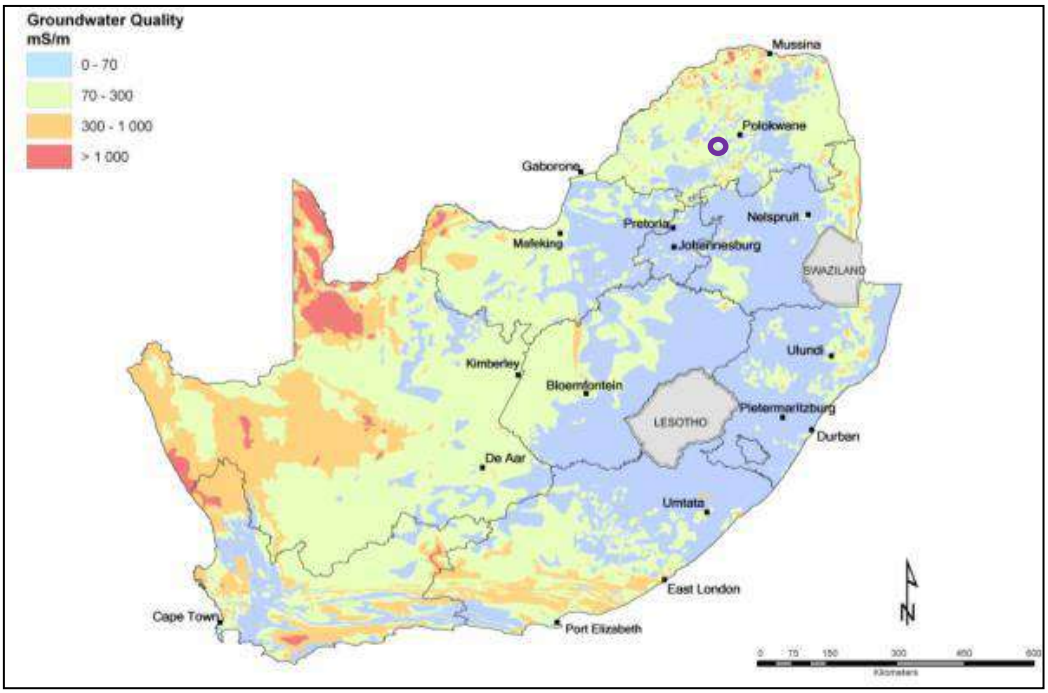


Figure 7: Inferred General Groundwater Quality of RSA

Based on the National groundwater level map (Figure 8), depth to groundwater within and around the Ndau site ranges generally from 10 to 17 m and from 17 to 25 m below ground level (m bgl), which is moderately shallow depth to groundwater level. A shallow groundwater level, that is mainly below 10 m bgl is expected to be vulnerable to surface derived pollutants. Based on the mean annual precipitation (MAP) which is about 532 mm/year and a maximum groundwater recharge rate of about 28 mm/year or 5.3% of MAP (GRAII data), the groundwater level and the yield of boreholes in the area is reasonably more than expected.

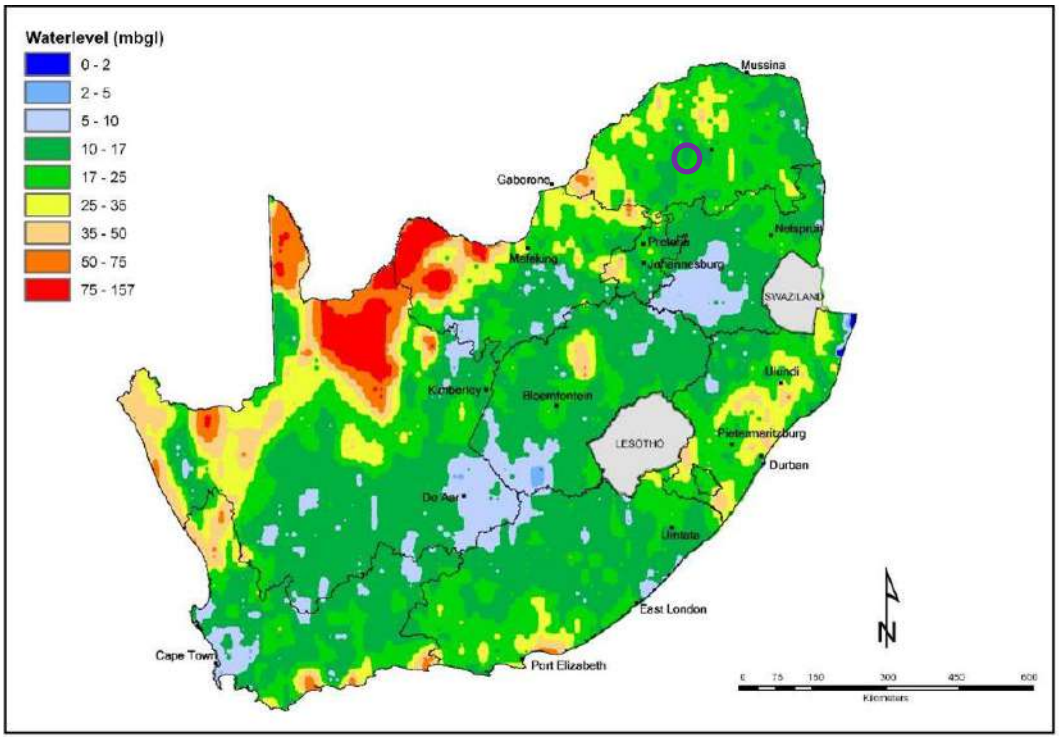


Figure 8: National Groundwater Level Map of South Africa

A Desktop hydrocensus was carried out at a 2 km and 5 km radius of the site as shown in Figure 9. Figure 9 below provides the borehole data information sourced from the National Groundwater Archive (NGA) of the Department of Water and Sanitation (DWS) for the area around the site. The information provided in the hydrocensus indicates that though there are a number of boreholes around the site, no groundwater level information exists to compare with the National groundwater level map shown in Figure 6. Furthermore, the borehole data extracted from the NGA doesn't show groundwater use type and pumping rate.

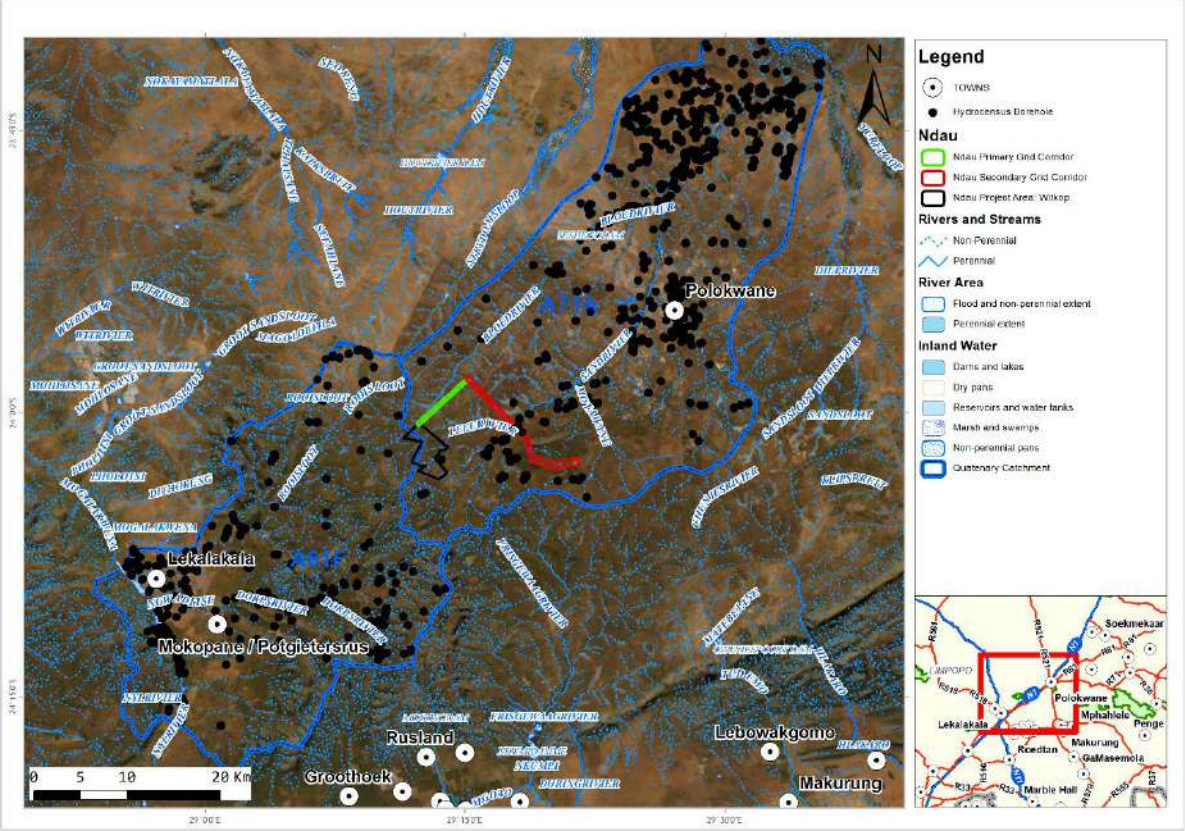


Figure 9: Desktop Hydrocensus within and around the Ndau study site

Furthermore, since there are a number of boreholes within and around the study site without detailed groundwater information, it is recommended that additional investigations based on site visit be done so as to get detailed information missing in the Desktop hydrocensus of the NGA data. The site visit must generate information including whether the boreholes are actively used or not, for what purpose they are being used? What is the pumping rate from these boreholes? What is the ambient groundwater quality from these boreholes? What is the depth to groundwater level in these boreholes? etc.

8. CONCLUDING COMMENTS

The immediate vicinity of the site is located in an area where groundwater occurs in intergranular and fractured aquifers with a very high borehole yield that is greater than or equal to 5 l/s. This implies that the site is characterized by a good aquifer in an otherwise semi-arid region. Furthermore, the Ndau site is located at a local drainage divide (i.e., between two quaternary catchments). Additionally, the general groundwater level can be as shallow as 10 meters but can go as deep as 25 m bgl and the generalized groundwater recharge for the area is between 14 and 28 mm/year, an indication that the groundwater resources have regional recharge sources as opposed to a local one.

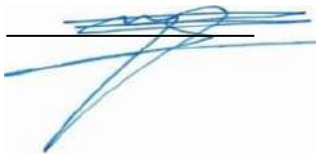
These information leads to the interim conclusion that the construction of Solar Farms at the site will have limited impact in terms of recharge diversion and reduction. However, the construction and the operation of the Solar Farm and associated infrastructures must be undertaken following the best practice to avoid pollution the important productive aquifer of the area. All in all, the project will have limited impact on groundwater recharge due to recharge diversion and reduction. However, if the contaminant release at the site during operation and construction of the project is controlled to a minimum, the sensitivity of the site from a geohydrological perspective to the intended solar Farm project is limited.

It is recommended that additional investigations be carried out on site such as a field hydrocensus to have a complete picture of the geohydrological conditions of the area including detailed geohydrological information related to the boreholes located within and in the vicinity of the Ndau study site.

Please note that there are known instances in which ground conditions can vary once the site investigation proceeds. It is imperative that Luhlaza Advisory and Consulting (Pty) Ltd is informed of any irregularities on-site so that updated recommendations can be given.

Yours faithfully,

For Luhlaza Advisory and Consulting (Pty) Ltd



Molla Demlie Pr. Sci. Nat (400297/11)

Specialist Hydrogeologist

PhD in Geohydrology

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