Pardus Solutions
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Site Sensitivity Verification and Soil, Land Use, And Agricultural Compliance Statement: For the Proposed Prospecting Rights Within the Abaqulusi Local Municipality In KwaZulu-Natal Province.

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DOCUMENT CONTROL

Report Name	Site Sensitivity Verification and Soil, Land Use, And Agricultural Compliance Statement: For the Proposed Prospecting Rights Within the Abaqulusi Local Municipality In KwaZulu-Natal Province.
Reference	AGR_Naira_25
Version	First Draft
Submitted to	Naira Environmental Consultants (Pty) Ltd
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Reviewer	Sinalo Malindie (PhD Candidate)
Date Produced	29 July 2025

EXECUTIVE SUMMARY

Pardus Solutions (Pty) Ltd was appointed by Naira Environmental Solutions (Pty) Ltd to conduct a soil, land use, and land capability study as part of the Environmental Authorisation (EA) process for the application for for a Prospecting Right in terms of Section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA. The proposed area for prospecting, hereafter referred to as the study area, is located approximately 43 kilometres east of the town of Vryheid and approximately 3 Kilometres South of Ngenetseni within the Abaqulusi Local Municipality in KwaZulu-Natal Province.

The study area falls within the humid subtropical climate zone, characterised by hot and humid summers and cool to mild winters. A deep current of tropical air dominates the humid subtropics at the time of high sun, and daily intense (but brief) convective thundershowers are common. The majority of the study area is characterised by rainfall ranging between 801 and 1000 mm, followed by rainfall ranging between 601 and 800 mm and rainfall greater than 1000 mm. This rainfall range is deemed sufficient for dryland cultivation (rain-fed); a wide range of adapted crops can receive good yields if planted on time.

Based on the observations during the site assessment, the dominant soils within the study area are Mispah/Glenrosa. The soils occurring within the entire study area do not meet the conditions for agricultural suitability to a certain extent, and these conditions include:

1. Adequate depth (greater than 60 cm) to accommodate root development for the majority of cultivated crops;
2. Good structure, as in water-stable aggregates, which allows for root penetration and water retention;
3. Sufficient distribution of high-quality and potential soils within the study area to constitute a viable economic management unit and
4. Good climatic conditions, such as sufficient rainfall and sunlight, increase crop variety.

Tables A and B below depict the summary findings of the soils identified within the study area and their respective land capability and agricultural potential status.

Table A: Summary findings within the study area.

Study Area				
Soil Forms	**Area (Ha)**	**Percentage (%)**	**Land Capability**	**Agricultural Potential**
Nkonkoni/Vaalbos	420.4	6.1	Arable (Class IV)	Moderate
Cartref	123.9	1.8	Watercourse (Class V)	Very Low
Dundee	347.7	5.1		
Mispah/Glenrosa	5809.3	84.9	Grazing (Class VI)	Low
Witbank/Johannesburg	140.4	2.1	Wilderness (Class VIII)	Very Low
Total Enclosed	**6841.7**	**100**		

Table B: Summary findings within the study area.

Soil Form	Land Capability Groups	DAFF (2017) Classification
Nkonkoni/Vaalbos	Arable Land	8. Moderate
Cartref	Watercourse	3. Very Low to Low
Dundee		
Mispah/Glenrosa	Grazing Land	5. Very Low to Low
Witbank/Johannesburg	Residential Areas	1. Very Low

The study area is proposed to serve as the locality of the proposed mining right permit application and is characterised by shallow miscellaneous and unconsolidated soils which encompass approximately 84.9% of the study area. These soils are more suited for forestry, wildlife conservation and light grazing. Due to steep slopes, these soils are more prone to erosion and the usage of any machinery for tillage purposes may be difficult. These soils can be transformed into cultivatable land through terracing and removal of stones by hand, which can be costly and labour intensive. In addition, the existing grazing activities can be relocated to other portions of the farm area, and thus, no grazing activities will be impacted.

The anticipated impact of the proposed prospecting right is expected to result in reversible effects on soils, primarily due to the limited scale and nature of the activities involved. This assessment remains valid, provided that the mitigation measures outlined in this document are diligently implemented. From a soil and land capability perspective, the cumulative loss is projected to be of low significance, especially with these safeguards in place. Notably, the absence of large-scale agricultural operations and only the modest practices of subsistence farming have influenced this conclusion. Nevertheless, it is essential to acknowledge that soils within the study area will inevitably undergo various forms of degradation stemming from the different operations that will occur during both the construction and operational phases of the proposed prospecting activities.

In this case, the study area is considered below the threshold for needing conservation as agricultural production land due to its limitations that make it unsuitable for cropping. If this land were used for non-agricultural purposes, it would lead to minimal loss of agricultural production potential in relation to national food security. As a result, the overall adverse agricultural impact of the development (loss of future agricultural production potential) is regarded as having low significance. From an agricultural impact point of view, it is recommended that the proposed development be approved. The conclusion of this assessment on the acceptability of the proposed development and the recommendation for its approval subject to adhering to the mitigation measures outlined in the document.

In accordance with the procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of Sections 24(5)(a) and (h) and 44 of the NEMA, 1998, when applying for environmental authorisation the current use of the land and the environmental sensitivity of the site under consideration as identified by the national web-based environmental screening tool, must be confirmed by undertaking a site sensitivity verification.
The outcome of this site sensitivity verification is to:

- Confirm or dispute the current use of the land and the environmental sensitivity as identified by the screening tool; and
- Motivate and provide evidence of either the verified or different use of the land and environmental sensitivity of the site.

The screening tool analysis was conducted, which presented the findings as the impact on agricultural resources being of very high sensitivity in terms of agricultural sensitivity. Based on the outcomes of the field assessment, it was found to have a low significant impact due to the dominant soil forms, which are not high-potential agricultural

soils, primarily due to various limitations, including a shallower depth and the need for intensive management strategies to cultivate. The land capability of the surrounding soils and the agricultural potential are very low to low due to inappropriate slope conditions, which may not allow for intensive commercial agricultural practices. The allocated sensitivities for the agricultural theme are presented on Table C below.

Table C: Summary of the screening tool vs specialist-assigned sensitivities.

SITE SENSITIVITY VERIFICATION			
	Screening Tool		**Site Verification Outcome**
Study Area	Very High Sensitivity		Low Sensitivity

It is the opinion of the specialist that this study provides the relevant information required for the Environmental Impact Assessment phase of the project to ensure that appropriate consideration of the agricultural resources in the study area are made in support of the principles of Integrated Environmental Management (IEM) and sustainable development.

DECLARATION OF INDEPENDENCE

- I Tshiamo Setsipane, in my capacity as a specialist consultant, hereby declare that I:
- Act/acted as an independent specialist to Naira Environmental Consultants (Pty) Ltd for this project.
- Do not have any personal, business, or financial interest in the project except for financial remuneration for specialist investigations completed in a professional capacity as specified by the Environmental Impact Assessment Regulations, 2014, as amended.
- Will not be affected by the outcome of the environmental process, of which this report forms part.
- Do not have any influence over the decisions made by the governing authorities.
- Do not object to or endorse the proposed developments but aim to present facts and my best scientific and professional opinion about the impacts of the development.
- Undertake to disclose to the relevant authorities any information that has or may have the potential to influence its decision or the objectivity of any report, plan, or document required in terms of the Environmental Impact Assessment Regulations, 2014, as amended.

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Tshiamo Setsipane (Pr. Sci. Nat)

DOCUMENT GUIDE

This report was compiled according to the following information guidelines for a specialist report in terms of the Environmental Impact Assessment (EIA) Sections 24(5)(a) and (h) and 44 of The National Environmental Management (NEMA) Act 1998, as summarised in the Table below.

Table A: Document guide according to Regulation (No. R. 982) as amended.

Theme-Specific Requirements as per Government Notice No. 320Agricultural Resources Theme – Very High and High Sensitivity Rating as per Screening Tool Output

No.	NEMA Regs (2014)- Appendix 6	Relevant section in the report
2	**Agricultural Agro-Ecosystem Specialist Assessment**	
2.1	The assessment must be undertaken by a soil scientist or agricultural specialist registered with the South African Council for Natural Scientific Professionals (SACNASP).	CV Attached
2.2	The assessment must be undertaken on the preferred site and within the proposed development footprint.	Section 1.1
2.3	**The assessment must be undertaken based on a site inspection as well as an investigation of the current production figures, where the land is under cultivation or has been within the past 5 years, and must identify:**	
2.3.1	the extent of the impact of the proposed development on the agricultural resources and	Section 5
2.3.2	whether or not the proposed development will have an unacceptable impact on the agricultural production capability of the site, and in the event it does, whether the positive impact of the proposed development on agricultural resources outweighs such a negative impact.	Section 5.2.1
2.4	**The status quo of the site must be described, including the following aspects, which must be considered as a minimum in the baseline description of the agro-ecosystem:**	
2.4.1	the soil form/s, soil depth (effective and total soil depth), top and sub-soil clay percentage, terrain unit, and slope;	Section 4.2
2.4.2	where applicable, the vegetation composition, available water sources, as agro-climatic information;	
2.4.3	the current productivity of the land-based on production figures for all agricultural activities undertaken on the land for the past 5 years, expressed as an annual figure and broken down into production units;	Section 1.6

2.4.4	the current employment figures (both permanent and casual) for the land for the past 3 years, expressed as an annual figure and	Section 1.6
2.4.5	existing impacts on the site, located on a map (e.g., erosion, alien vegetation, non-agricultural infrastructure, waste, etc.).	Section 4.1
2.5	**Assessment of impacts, including the following aspects which must be considered as a minimum in the predicted impact of the proposed development on the agro-ecosystem:**	
2.5.1	change in productivity for all agricultural activities based on the figures of the past 5 years, expressed as an annual figure and broken down into production units;	Section 1.6
2.5.2	change in employment figures (both permanent and casual) for the past 5 years expressed as an annual figure and	N/A
2.5.3	any alternative development footprints within the preferred site would be of “medium” or “low” sensitivity for agricultural resources as identified by the screening tool and verified through the site sensitivity verification.	Section 5.2
2.6	**The Agricultural Agro-Ecosystem Specialist Assessment findings must be written up in an Agricultural Agro-Ecosystem Specialist Report.**	
2.7	**This report must contain the findings of the agro-ecosystem specialist assessment and the following information, as a minimum:**	
2.7.1	Details and relevant experience as well as the SACNASP registration number of the soil scientist or agricultural specialist preparing the assessment, including a curriculum vitae;	Appendix C
2.7.2	A signed statement of independence by the specialist;	Appendix A
2.7.3	The duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;	Section 2.2
2.7.4	A description of the methodology used to undertake the on-site assessment inclusive of the equipment and models used, as relevant;	Section 2
2.7.5	A map showing the proposed development footprint (including supporting infrastructure) with a 50m buffered development envelope, overlaid on the agricultural sensitivity map generated by the screening tool;	Figures 1,2 and 3
2.7.6	An indication of the potential losses in production and employment from the change of the agricultural use of the land as a result of the proposed development;	Section 1.6

2.7.7	An indication of possible long-term benefits that will be generated by the project in relation to the benefits of the agricultural activities on the affected land;	Section 5
2.7.8	Additional environmental impacts expected from the proposed development based on the current status quo of the land including erosion, alien vegetation, waste, etc.;	Section 5.2.1
2.7.9	Information on the current agricultural activities being undertaken on adjacent land parcels;	Section 4.1
2.7.10	An identification of any areas to be avoided, including any buffers;	N/A
2.7.11	A motivation must be provided if there were development footprints identified as per paragraph 2.5.3 above that were identified as having a “medium” or “low” agriculture sensitivity and that were not considered appropriate;	Section 5
2.7.12	Confirmation from the soil scientist or agricultural specialist that all reasonable measures have been considered in the micro-siting of the proposed development to minimise fragmentation and disturbance of agricultural activities;	Section 5
2.7 .13	A substantiated statement from the soil scientist or agricultural specialist with regards to agricultural resources on the acceptability or not of the proposed development and a recommendation on the approval or not of the proposed development;	Section 5
2.7.14	Any conditions to which this statement is subjected;	Section 5
2.7.15	Where identified, proposed impact management outcomes or any monitoring requirements for inclusion in the Environmental Management Programme (EMPr); and	Section 5
2.7.16	A description of the assumptions and any uncertainties or gaps in knowledge or data.	Section 1.6
2.8	The Agricultural Agro-Ecosystem Specialist Assessment findings must be incorporated into the Basic Assessment Report or Environmental Impact Assessment Report, including the mitigation and monitoring measures identified, which are to be contained in the EMPr.	
2.9	A signed copy of the assessment must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.	

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1. INTRODUCTION

Pardus Solutions (Pty) Ltd was appointed by Naira Environmental Solutions (Pty) Ltd to conduct a soil, land use, and land capability study as part of the Environmental Authorisation (EA) process for the application for a Prospecting Right in terms of Section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA. The proposed area for prospecting, hereafter referred to as the study area, is located approximately 43 kilometres east of the town of Vryheid and approximately 3 Kilometres South of Ngenetseni within the Abaqulusi Local Municipality in KwaZulu-Natal Province. Figure 1 below illustrates the location of the study area in relation to its surrounding areas. Figure 2 below depicts the topographic locality map.

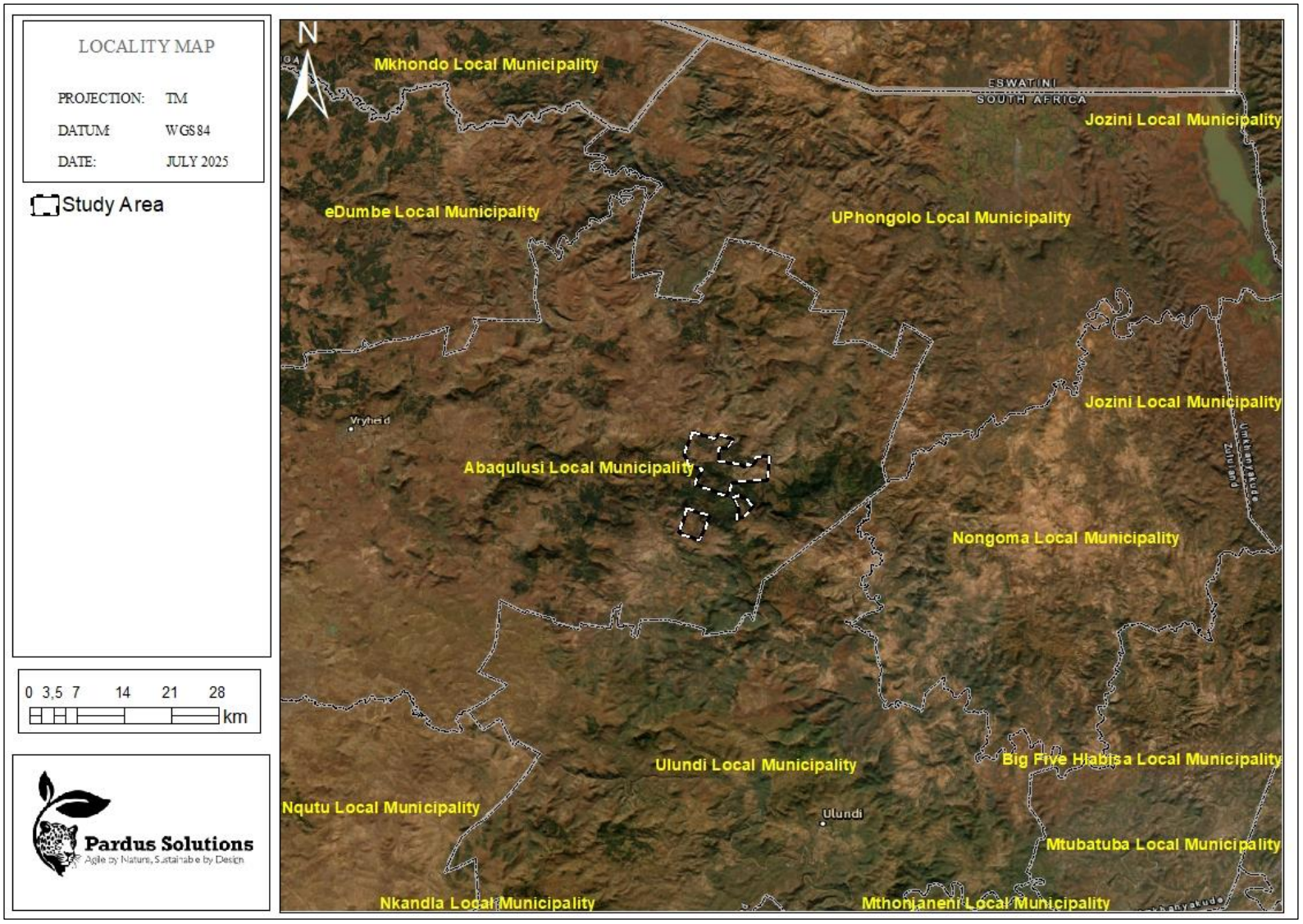

Figure 1: Locality of the study area in relation to the surrounding areas and the associated layout.

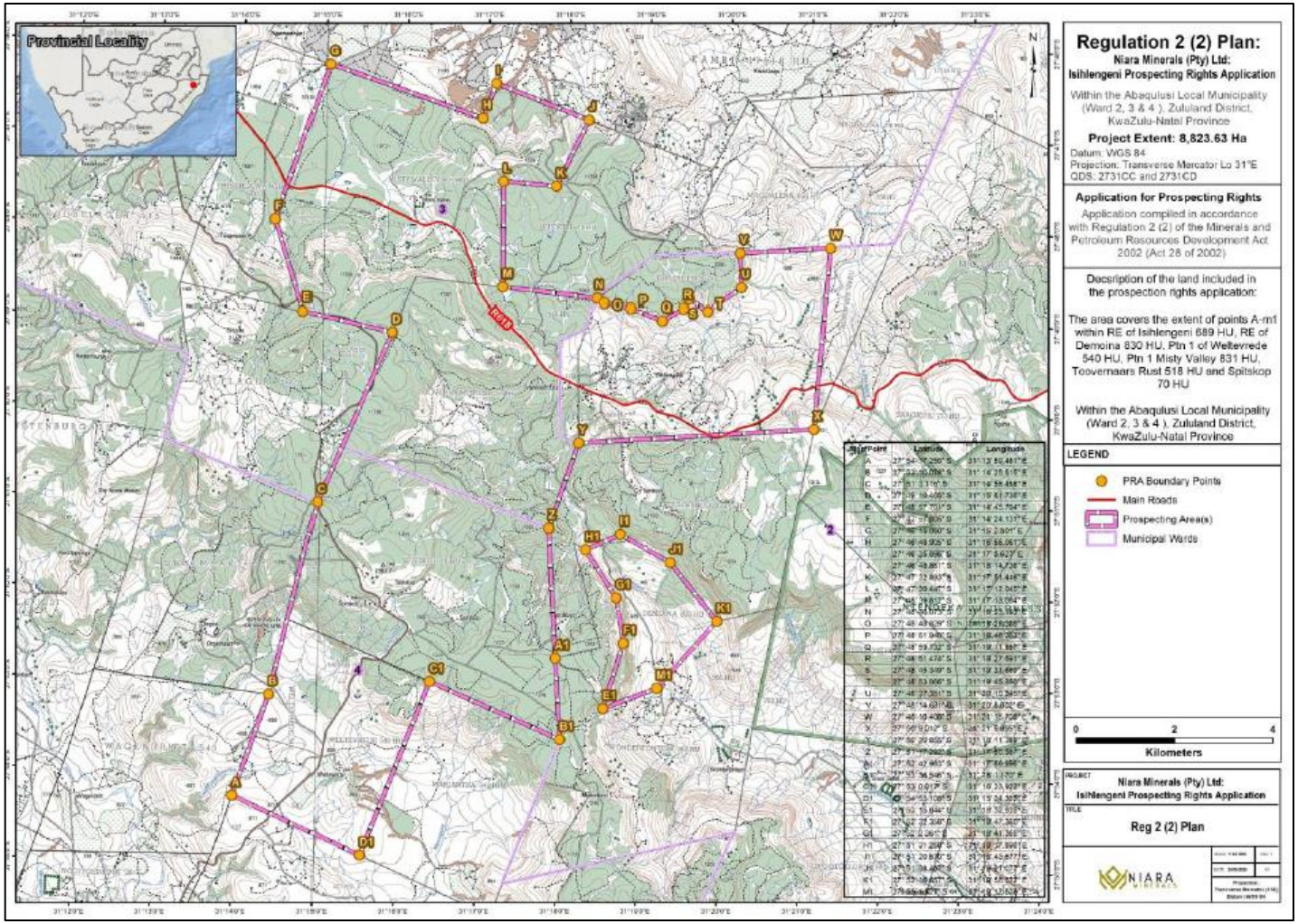

Figure 2: Topographic locality map of the study area.

1.1 PROJECT DESCRIPTION

The proponent wishes to apply for a Prospecting Right in terms of Section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA), for the exploration of coal, pseudo-coal, and torbanite/oil shale. The application area spans various farm portions, namely the Remaining Extent of Isihlengeni No. 689; the Remaining Extent of Demoina No. 830; Portions 4 and 5 of Wonderfontein No. 560; Portion 5 of Mariantha No. 845; Portion 1 of Weltevrede No. 540; the Remaining Extent and Portion 1 of Wagendrift No. 541; the Remaining Extent and Portion 1 of Ongemaakt No. 301; the Remaining Extent, Portion 1, and Portion 2 of Zalflager No. 525; Portion 8 of Frischgewaagd No. 401; Portion 1 of Misty Valley No. 831; Portions 0, 1, 3, 4, and 6 of Toovernaars Rust No. 518; and Portions 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, and 19 of Spitzkop No. 70. The proposed prospecting area is located within the Abaqulusi Local Municipality, under the Amajuba District Municipality in the KwaZulu-Natal Province, covering a total area of approximately ~9 hectares. The project area is situated approximately 3 km south of Ngenetseni and about 23 km south of Louwsburg.

A proposal has been developed for the implementation of approximately 10 to 15 boreholes, each designed to occupy a minimal surface footprint, within a 15-hectare prospecting area. The precise locations of these boreholes will be ascertained following a comprehensive evaluation that includes desktop studies, field mapping, and geophysical surveys, with a commitment to minimizing environmental impact while ensuring effective sampling.

The drilling operations, which aim to ascertain the existence, depth, thickness, and quality of mineral formations, will utilize rotary core drilling rigs, supported by transport vehicles and water tanks. These operations will adhere to all relevant safety and environmental regulations.

The prospecting program is structured to occur over four phases within a five-year timeframe, with the option for a three-year extension if deemed necessary. Furthermore, it is imperative that the project undergoes a Basic Assessment process in compliance with the National Environmental Management Act (NEMA).

Proposed prospecting activities will include the following phases:

- Site Establishment
    - Limited clearing of vegetation will be conducted to create access routes and establish operational zones at borehole locations.
    - A bulldozer or equivalent light machinery will be used to clear the minimum footprint necessary for drilling.
    - Temporary facilities such as, equipment laydown areas, portable sanitation units, temporary water storage tanks and a mobile site office or control point if needed.

- Access Road
    - Existing roads will be used as far as practicable to reduce environmental disturbance. Where new access is necessary, routes will be selected based on preliminary environmental sensitivity assessments to avoid ecologically sensitive or protected areas.
    - New roads, if required, will be constructed using best environmental practices, including erosion control, proper drainage, and minimal compaction.

- Trenching and Bulk Sampling
    - Approximately 10 to 15 boreholes will be drilled within the prospecting area.
    - Each borehole site will require a disturbance footprint of approximately 25 m × 20 m (500 m²) including space for the rig, support vehicles, drill cuttings containment, and operational safety zones.
    - The total disturbed area from boreholes is estimated at 0.5 to 0.75 hectares, with the remainder of the 15-hectare area allocated for access and support infrastructure.
    - Boreholes may reach depths of up to 120 meters, depending on geological conditions.
    - Drilling will utilise rotary core rigs to obtain continuous core samples.
    - Borehole casing and grouting will be applied where necessary to maintain borehole integrity and prevent aquifer contamination.
    - Water for drilling will be sourced locally or supplied via mobile tanks. Water use will be monitored to avoid overuse or spillage.
    - Drill cuttings and wastewater will be managed in lined pits or tanks and disposed of per the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008).
    - Borehole locations will be finalised after desktop and field studies to optimise resource targeting and minimise environmental impact.
    - The prospecting activities will be conducted in compliance with all relevant legislation and environmental best practices. Mitigation measures will be implemented to manage dust, erosion, noise, and habitat disturbance. Rehabilitation will be carried out progressively to restore disturbed areas to a condition similar to their pre-activity state.

1.2 AIMS AND OBJECTIVES OF THE STUDY

The objective of the Soil, Land Use, and Land Capability is to fulfil and align the proposed project with the requirements of the Conservation of Agricultural Resources Act (CARA), 1983 (Act No. 43 of 1983) of South Africa. This act aims to promote the conservation of soil, water sources, and vegetation, as well as the control of weeds and invader plants by managing natural agricultural resources. Thus, the proposed study aims to determine the possible impacts of the proposed development on the soil, land use, land capability, and agricultural potential and identify areas of high sensitivity within the study area. This will be achieved by considering parameters such as soil

quality, drainage, topography, climate, and water availability and providing sound input to ensure that land is used sustainably and responsibly. As such, this specialist report has assessed and considered the following:

- The soil forms occurring within the study area;
- The associated land capability and agricultural sensitivity of the soils occurring within the study area;
- Discussion of the land capability and sensitivity in terms of the soils, water availability, surrounding development, and current status of land;
- Discussion of potential and actual impacts as a result of the proposed development; and
- Provide mitigation for the impacts as part of the Environmental Management Programme (EMPr).

1.3 Suitability of soils for agricultural cultivation

Assessing soil suitability for agricultural cultivation rests primarily on identifying soils suited to crop production. For soils to be classified as being suitable for crop cultivation, they must have the following properties:

- Adequate depth (greater than 60 cm) to accommodate root development for the majority of cultivated crops;
- Good structure, as in water-stable aggregates, which allows for root penetration and water retention;
- Sufficient clay and organic matter to provide nutrients for growing crops;
- Sufficient distribution of high quality and potential soils within the study area to constitute a viable economic management unit;
- Adequate clay content and deep enough water table to allow for water storage; and
- Good climatic conditions, such as sufficient rainfall and sunlight, increase crop choice variety.

1.4 Applicable Legislation

The most recent South African Environmental Legislation that needs to be considered for any new or expanding development with reference to assessment and management of soil and land use includes:

- The National Environmental Management Act. 1998 (Act 107 of 1998), requires that pollution and degradation of the environment be avoided, or, where it cannot be avoided, be minimised and remedied.
- The Conservation of Agricultural Resources (Act 43 of 1983) states that the degradation of the agricultural potential of soil is illegal.
- The Conservation of Agriculture Resources (Act 43 of 1983) requires the protection of land against soil erosion and the prevention of water logging and salinization of soils employing

suitable soil conservation works to be constructed and maintained. The utilisation of marshes, water sponges, and watercourses is also addressed.

1.5 Terms of Reference

The terms of reference for this study are to fulfil the requirements of the Protocol for the specialist assessment and minimum report content requirements of environmental impacts on agricultural resources gazetted on 20 March 2020 in GN 320 (in terms of Sections 24(5)(A) and (H) and 44 of NEMA, 1998).

The study area includes land classified by the national web-based environmental screening tool on 27 July 2025 as having high sensitivity for impacts on agricultural resources. The level of agricultural assessment required in terms of the protocol (and hence in terms of NEMA) is, therefore, an Agricultural Agro-Ecosystem Specialist Assessment. The terms of reference for such an assessment, as stipulated in the protocol, are listed in the Document Guide with relevant section numbers of this report, which also fulfils each stipulation. The protocol also requires that a Site Sensitivity Verification be done.

The summarised terms of reference applicable to the Soils, Land Capability, and Land Use Study include the following:

- A review of available desktop information about the study area site and compile various maps illustrating the desktop data;
- Discussion of the relevant desktop literature;
- Conduct a soil classification survey covering the study area according to the South African Soil Classification System: A Natural and Anthropogenic System for South Africa (Soil Classification Working Group, 2018);
- Determination of the current (baseline) soil physical, climatic conditions, and land uses, as well as the current land capabilities and agricultural sensitivity associated with the identified soil forms present in the study area;
- Identification and assessment of the potential impacts of the different project phases on the baseline soil, land use, and land capability properties as a result of the proposed development;
- Development of mitigation and management measures to minimise the negative impacts anticipated from the proposed development and
- Compile soil, land use, and land capability reports based on the field-finding data under on-site conditions.

1.6 ASSUMPTIONS, ASSUMPTIONS UNCERTAINTIES, LIMITATIONS, AND GAPS

The following assumptions, uncertainties, limitations, and gaps were applicable for the soil, land use, and land capability assessment:

- It is assumed that the infrastructure components will remain as indicated on the layout and that the activities for the construction and operation of the infrastructure are limited to those typical for a project of this nature;
- Certain portions of the study area could not be accessed due to road constraints and lack of access to private land;
- The soil survey was confined to the study area outline with consideration of various land uses outside the study area;
- During the site assessment and compilation of the report, employment figures pertaining to the study area could not be sourced; and
- Soil profiles were observed using a 1.5m hand-held soil auger; thus, a description of the soil characteristics deeper than 1.5m cannot be given.

2. METHODOLOGY

The assessment of the Study Area's agricultural potential was based on a combination of desktop studies to gather general information, site visits for status quo assessment, soil classification and characterization, and validation of the information generated from the desktop studies.

2.1 Desktop Study and Literature Review

Literature review and background study were carried out before beginning the field assessment to gather the study area's predetermined soil, land use, and land capability data. The data was sourced from the Soil and Terrain (SOTER) database and the Natural Agricultural Atlas of South Africa Version 3: (https://ndagis.nda.agric.za/portal/apps/webappviewer/index.html?id=8b72eb2a25c04660a1ab2b562f6ec0bf)

2.2 Site Survey and Sensitivity Verification

A desktop assessment was followed by a field investigation to validate the predetermined soil results obtained at the desktop level. The field survey was conducted over two days in July 2025, during which time soil auger tests were conducted, and soils were classified into soil forms according to the Soil Classification System: A Natural and Anthropogenic System for South Africa Soil Classification System (2018). It must be noted that the season has no bearing on the soil's morphological properties over a short-term period.

The aim of the on-site Site Sensitivity Verification was to:

- Ground truth if there are any cultivation activities and consequent agricultural sensitivity;
- Gain an understanding of the agricultural potential of the study through the identified soils on site as well infrastructure; and
- Confirm or dispute the current land use and the environmental sensitivity as indicated by the National Environmental Screening Tool.

2.3 Land Capability Classification

A land capability class is an interpretive grouping of land units with similar potential and containing limitations or hazards for long-term intensive use of land for rainfed farming determined by the interaction of climate, soil, and terrain. It is a more general term than land suitability and is more conservation-oriented (See Table 1 below). It involves consideration of:

- Varying limitations to land use pertaining to rainfed cultivation and soil properties; and
- The risks of land damage from erosion and other causes.

Eight land capability classes were employed with potential decreases, limitations, and hazards increasing from class 1 to class 8. Classes 1 to 4 are considered arable, whereas Class 5 is considered wet-based soils or watercourses and Classes 6 to 8 are classified as grazing, forestry, or wildlife. This system is based on the Land Capability Classification system of the United States Department of Agriculture (USDA) Soil Conservation Service by Klingelbiel and Montgomery (1961) as well as by Scotney *et.al* (1987).

Table 1: Soil Capability Classification (after Scontey *et al.*, 1987).

Land Capability Group	Land Capability Class	Intensity of Land Use									
		wildlife	Forestry	Light grazing	Moderate grazing	Intensive grazing	Light cultivation	Moderate cultivation	Intensive cultivation	Very intensive cultivation	Limitations
Arable	I										There are no or few limitations. Very high arable potential. Very low erosion hazard
	II										Slight limitations. High arable potential. Low erosion hazard
	III										Moderate limitations. Some erosion hazards
	IV										Severe limitations. Low arable potential. High erosion hazard.
Grazing	V										Water course and land with wetness limitations
	VI										Limitations preclude cultivation. Suitable for perennial vegetation
	VII										Very severe limitations. Suitable only for natural vegetation
Wildlife	VIII										Extremely severe limitations. Not suitable for grazing or afforestation.

The updated and refined land capability ratings and database for the whole of South Africa were released by the Department of Fishery and Forestry (DAFF) in 2017. These land capability ratings were derived through a spatial evaluation modelling approach and a raster spatial data layer comprising fifteen (15) land capability evaluation values 9 (see Table 2 below). The new land capability describes the categories as 1 being the lowest and 15 being the highest. Values of below 8 are generally not suitable for producing cultivated crops. (DAFF, 2017). Soil agricultural potential is impacted by several factors (see Table 3 below). The soil agricultural potential was evaluated based on the factors mentioned and described in Table 3 by assigning qualitative criteria ratings such as High, Moderate, or Marginal too low to the updated land capability ratings.

Table 2: National Land Capability Values (DAFF, 2017).

Land Capability evaluation value	Land Capability Description
1	Very Low
2	
3	Very Low to Low
4	
5	Low
6	Low to Moderate
7	
8	Moderate
9	Moderate to High
10	
11	High
12	High to Very High
13	
14	Very High
15	

Table 3: Soil Agricultural Potential Criteria

Criteria	Description
Rock Complex	If a soil type has prevalent rocks in the upper sections of the soil, it is a limitingfactor to the soil's agricultural potential.
Flooding Risk	The risk of flooding is determined by the closeness of the soil to water sources.
Erosion Risk	The soil erosion risk is determined by combining the wind and watererosion potentials.
Slope	The slope of the site could potentially limit the agricultural use thereof.
Texture	The texture of the soil can limit its use by being too sandy or too clayey.
Depth	The effective depth of soil is critical for the rooting zone for crops.
Drainage	The capability of soil to drain water is important as most grain crops do nottolerate submergence in water.
Mechanical Limitations	Mechanical limitations are any factors that could prevent the soil from beingtilled or ploughed.
pH	The pH of the soil is important when considering soil nutrients and fertility.
Soil Capability	This section highlights the soil type's capability to sustain agriculture.
Climate Class	The climate class highlights the prevalent climatic conditions that couldinfluence the agricultural use of a site.
Land Capability / Agricultural Potential	The land capability or agricultural potential rating for a site combines the soil capability and the climate class to arrive at the potential of the site to support agriculture.

2.4 DFFE Screening Tool

The Agricultural Agro-Ecosystem Assessment protocol provides the criteria for assessing and reporting impacts on agricultural resources for activities requiring Environmental Authorisation (EA). The assessment requirements of this protocol are associated with a level of environmental sensitivity determined by the national web-based environmental screening tool, which, for agricultural resources, is based on the most recent land capability evaluation values provided by the Department of Forestry, Fisheries, and the Environment (DFFE). The national web-based environmental screening tool can be accessed at: https://screening.environment.gov.za/screeningtool.

The primary purpose of the Agricultural Agro-Ecosystem Assessment is to determine the site's sensitivity considering the proposed land use change (from potential agricultural land to the proposed development is sufficiently considered). The information in this report aims to enable the Competent Authority (CA) to draw sound conclusions and recommendations on the proposed project and its potential impacts with a specific focus on food security.

To meet this objective, the protocol requires that site sensitivity verification be conducted, and subsequent outcomes must meet the following objectives:

- It must confirm or dispute the current land use, and the environmental sensitivity as indicated by the National Environmental Screening Tool;
- It must contain proof (e.g., photographs) of the current land use and environmental sensitivity pertaining to the study area;
- All data and conclusions are submitted together with the main report for the proposed development;
- It must indicate whether the proposed development will have an unacceptable impact on the agricultural production capability of the site, and if it does, whether such a negative impact is outweighed by the positive impact of the proposed development on agricultural resources and
- The report is prepared in accordance with the requirements of the Environmental Impact Assessment Regulations.

Thus, the report is compiled to meet the minimum report content requirements for impacts on agricultural resources by the proposed development.

2.5 DFFE Screening Tool

The Screening tool for the study area wherein the proposed development is to take place is presented in Figure 3 below.

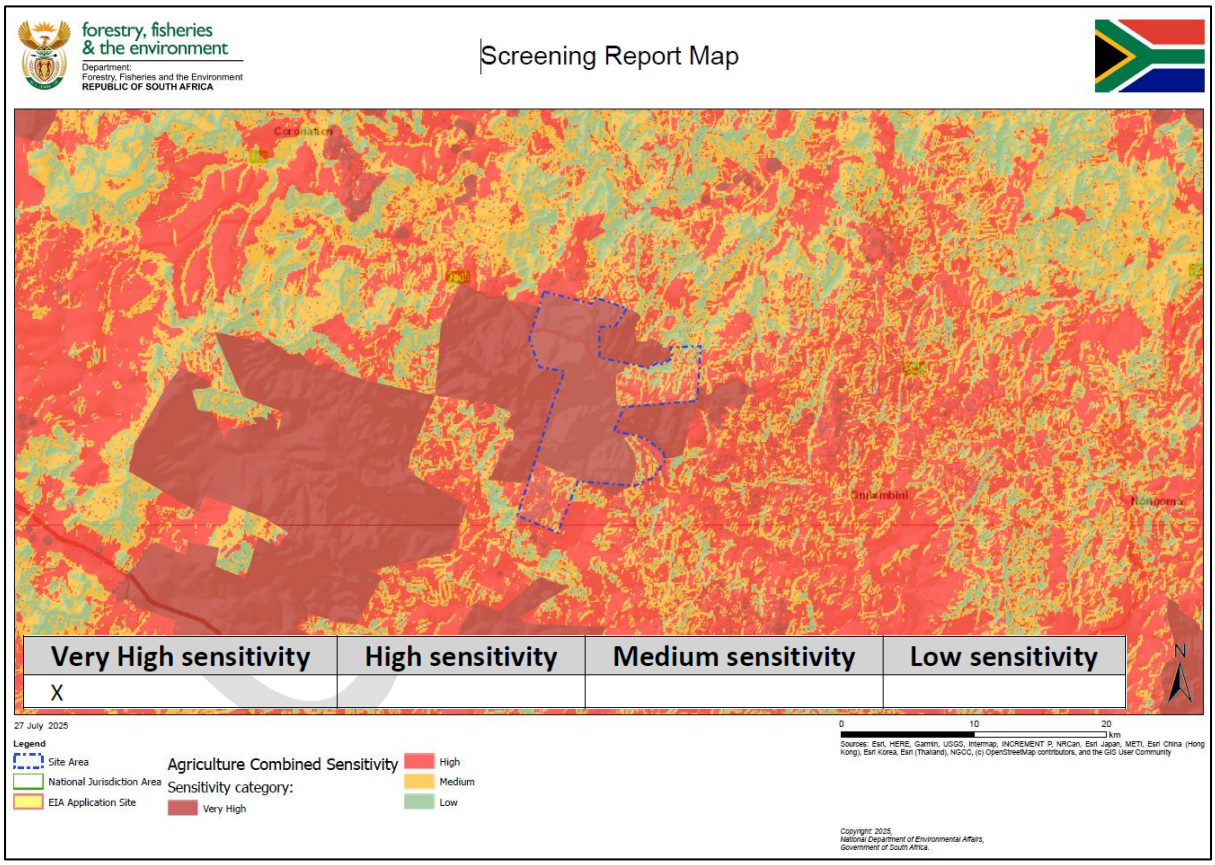

Figure 3: Screening tool sensitivity for the study area.

3. DESKTOP RESULTS AND DISCUSSIONS

3.1 CLIMATIC DATA

The study area falls within the humid subtropical climate zone, characterised by hot and humid summers and cool to mild winters. A deep current of tropical air dominates the humid subtropics at the time of high sun, and daily intense (but brief) convective thundershowers are common. The majority of the study area is characterised by rainfall ranging between 801 and 1000 mm, followed by rainfall ranging between 601 and 800 mm and rainfall greater than 1000 mm. This rainfall range is deemed sufficient for dryland cultivation (rain-fed); a wide range of adapted crops can receive good yields if planted on time. Figure 4 shows the mean annual rainfall associated with the study area.

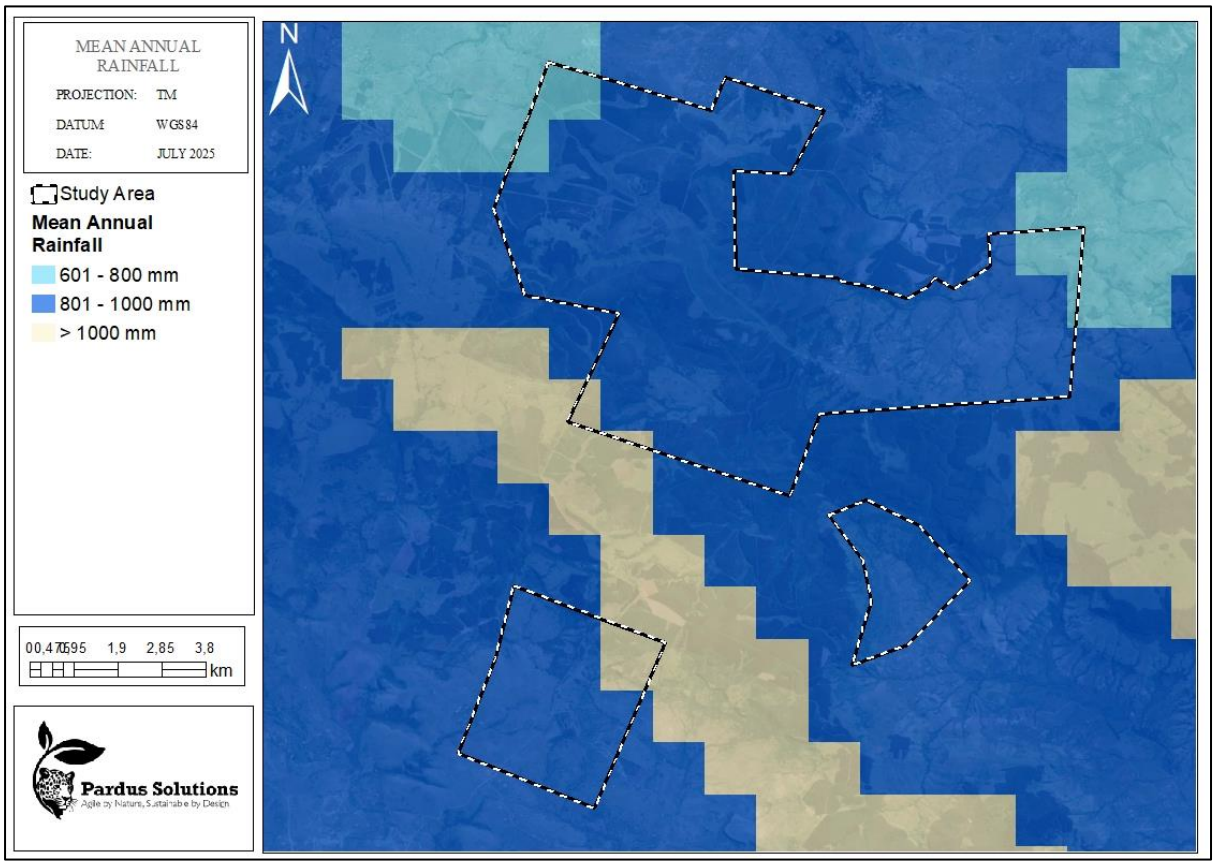

Figure 4: Mean Annual Rainfall associated with the study area.

3.2 GEOLOGY

The soils associated with the majority of the study area are underlain largely by the Ecca group lithology, which Is the second of the main subdivisions of the Karoo Supergroup of geological strata in southern Africa. It mainly follows the Dwyka Group in some sections, but in other localities, it overlies unconformably much older basement rocks. Ecca shale is typically dark-coloured, as it is carbon-rich due to the high vegetation content of the original sediments. Fine bedding or laminations may also be noted, and the shales tend to crumble easily. The Dwyka Group forms the lowermost and oldest deposit in the Karoo Supergroup basin. Figure 5 depicts the geology associated with the study area.

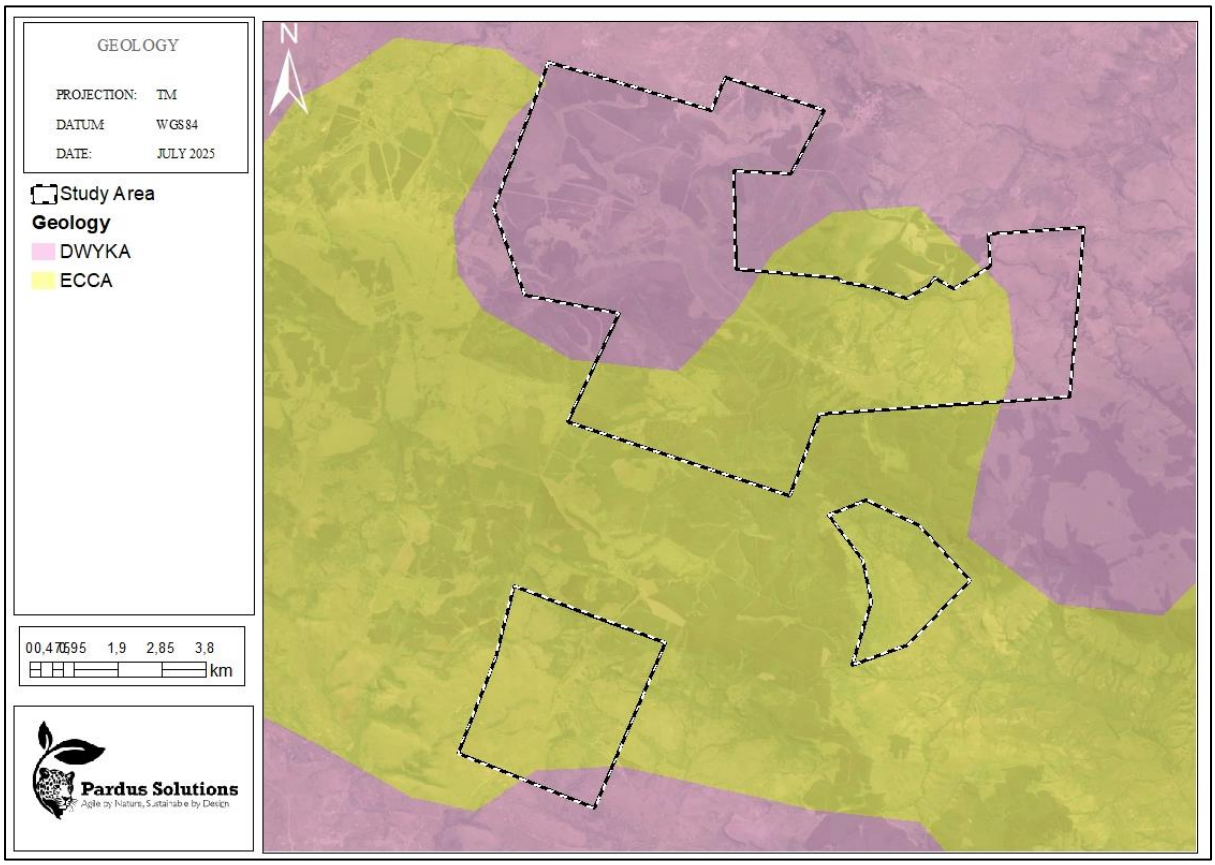

Figure 5: Geological formations associated with the study area.

3.3 Soil pH

The soil pH associated with the soils in the study area ranges from 0 to 6.4. This pH range is considered strongly acidic to slightly acidic. The low pH can be attributed to other factors, which include but are not limited to:

- Parent material;
- Loss of organic matter;
- Removal of soil minerals when crops are harvested;
- Erosion of the surface layer; and
- Effects of nitrogen and Sulphur fertilisers.

This pH range can still be considered acceptable; however, soil, aluminium, and manganese can become more available and more toxic to plants, while calcium, phosphorus, and magnesium are less available. Figure 6, below, depicts the soil pH associated with soils within the study area.

Figure 6: Soil pH associated with the study area.

3.5 Soil and Terrain (SOTER) Dominant Soils

The entire study area is characterised by dystrophic regosols. These soils are characterised by loose, broken rock material and weakly developed soils covering the bedrock. These soils are common in mountainous areas. These soils are typically utilised for low-volume grazing, wood picking under forestry and, in some instances, capital-intensive irrigated farming. Figure 7, below, depicts the SOTER soils associated with the study area.

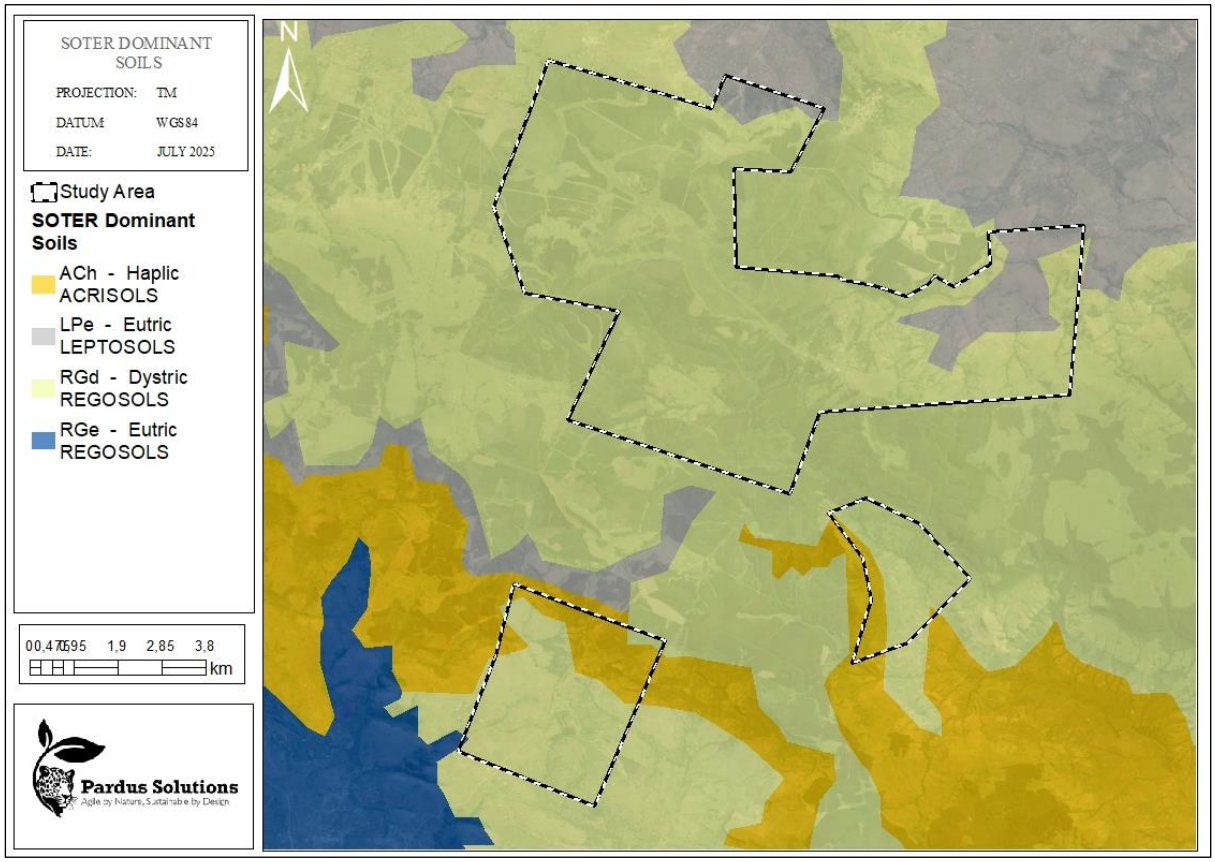

Figure 7: SOTER dominant soils associated with the study area.

3.6 Desktop Land Capability

The desktop land capability associated with the study area is largely characterised by marginal potential arable land of Class IV capability, followed by Moderate potential arable land of Class III capability and non-arable grazing land, woodland or wildlife of Class V capability. Figure 8 below shows the desktop land capability associated with the study area.

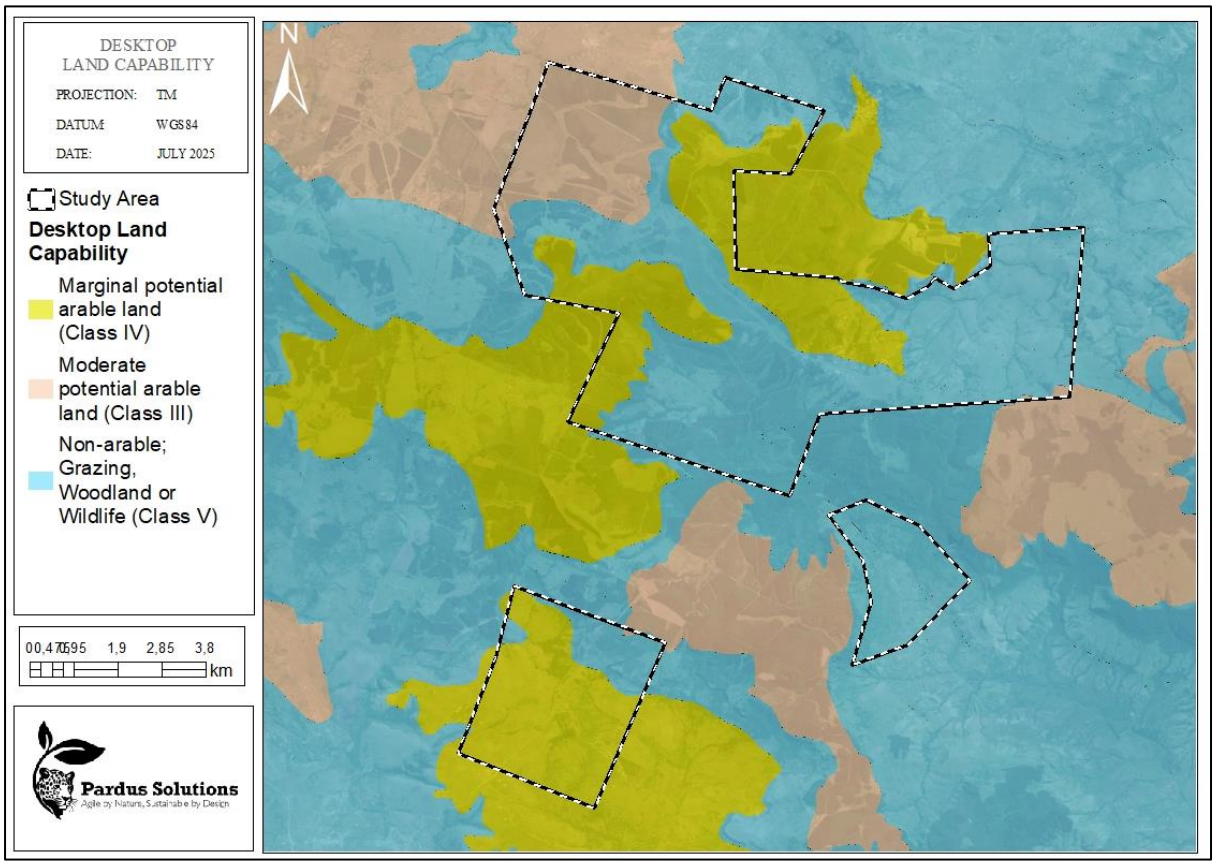

Figure 8: Desktop land capability associated with the study area.

3.9 Soil Depth

The entire study area is largely characterised by soil depths between 450 mm and 750 mm and depths of less than 450 mm. This soil depth is considered suitable for various crops, and deeper soils can hold more plant nutrients and water than shallow soils with similar textures. Figure 9 illustrates the soil depth associated with the study area.

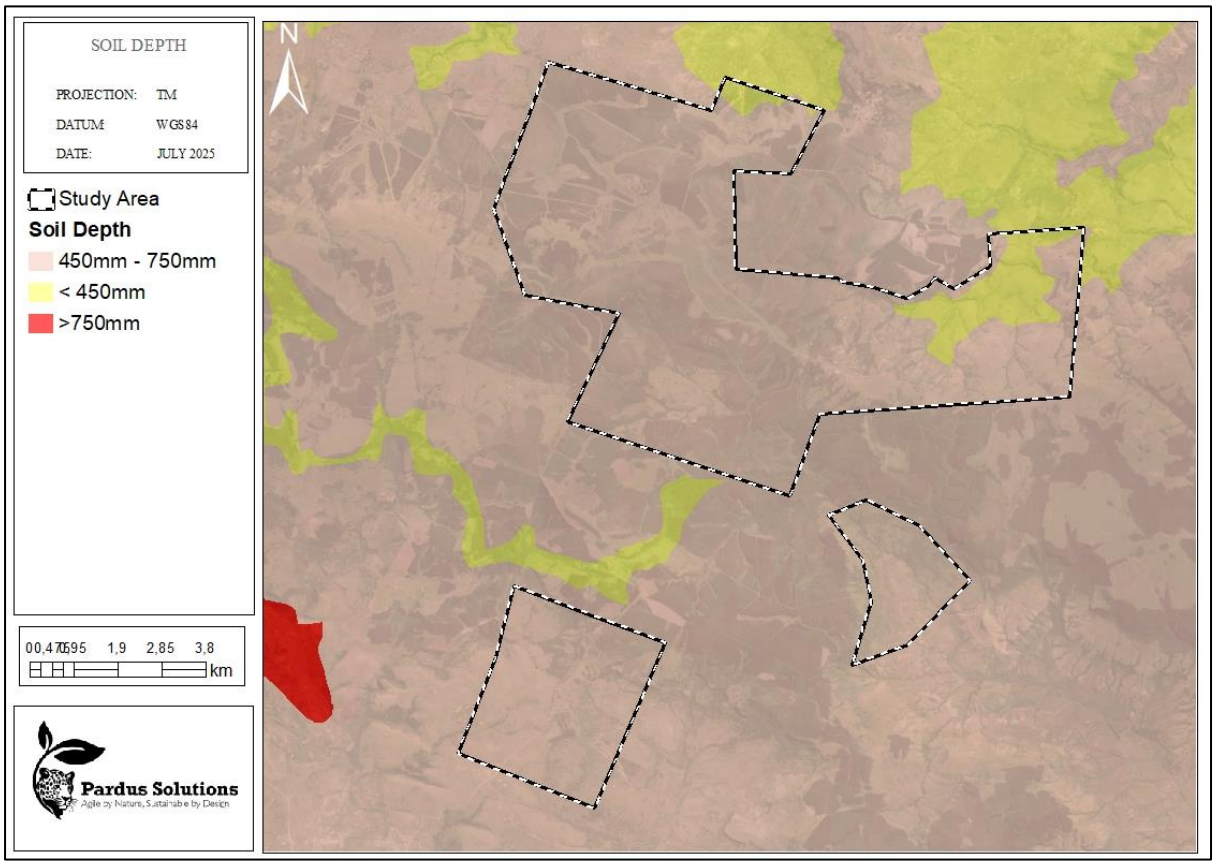

Figure 9: Soil depth of soil associated with the study area.

4. FIELD VERIFIED RESULTS AND DISCUSSIONS

4.1 Land Uses within the Study Area

The study area is largely characterised by commercial forest plantations utilised for firewood, timber, medicinal resources and recreational purposes. Livestock and subsistence farming were observed within and around the residential dwellings. Signs of degradation in the form of erosion gullies were also observed within the study area. Figure 10 depicts the different land uses identified within the study area.

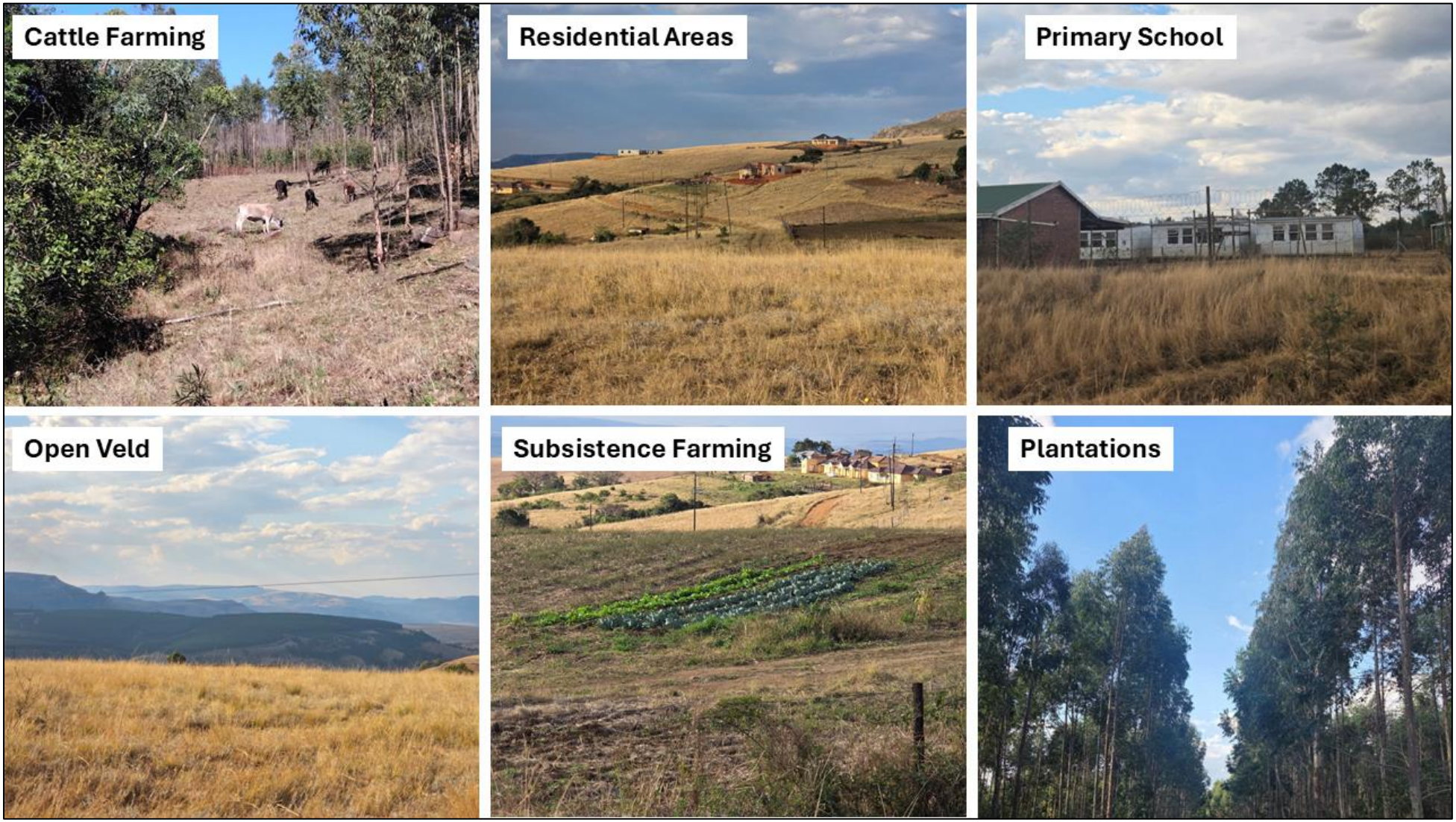

Figure 10: Land uses within the study area.

4.2 Soil Forms in the Study Area

The section below focuses on the identified soil forms within the study area described below. Figure 16 presents the spatial distribution of the identified soil forms within each study area. Table 4 presents a summary table depicting the area of coverage of each identified soil form.

4.2.1 Mispah/Glenrosa

These soils are typically shallow. The shallow depth can be attributed to limited rock weathering and convex topographical conditions at the crest or scarp of the landscape, resulting in soil removal and, in some instances, leaving rocky outcrops behind (Figure 11). These soils are typically avoided for intensive use and are often left for grazing, forestry, and wildlife land uses, unless intense management strategies are employed, such as breaking the lithic/saprolite layer. The Mispah/Glenrosa soil forms are classified under the Grazing (Class VII) land capability class as they are primarily suited for perennial vegetation and have limitations that preclude cultivation.

Figure 11: View of the identified shallow Mispah/Glenrosa soil forms.

4.2.2 Nkonkoni

The Nkonkoni soil form consists of a sandy orthic A horizon on a well-drained red apedal B horizon overlying lithic material where limited pedogenesis has taken place (Figure 12). The soil depths of the Hutton profiles surveyed on site were 700 mm. Thus, these soils can be considered for agricultural cultivation due to their sandy textural class, as they allow for root development but may be hindered by the shallow depth and provide good aeration for plant growth. The Nkonkoni soils are classified under the Arable (Class IV) land capability class due to depth limitations, moderate arable potential and a lower nutrient status.

Figure 12: View of the identified red apedal horizons associated with the Nkonkoni soil formation.

4.2.3 Cartref

These soils are characterised by long periods of saturation leading to the formation of albic (loss of colloidal matter or bleaching) properties in the subsoil. These conditions are often influenced by the slope conditions and the high clay content of the gleyed horizon below the albic horizon. The topsoil and the albic horizons are typically very low on nutrient content, and the gleyed horizon is characterised by a high clay content, which may impede root penetration and thus create anaerobic conditions not suitable for most cultivated crops. Consequently, these soils are classified as being of low agricultural value and under the Watercourse (Class V) land capability classification. Figure 13 depicts the identified soil types

Figure 13: View of the identified wet-based soils.

4.2.4 Dundee

The Dundee soil type is associated with watercourses due to the alluvial deposition, especially on low-lying terrain positions. These soils are characterised by little evidence of pedogenic horizonation and consist of unconsolidated fluvial or lacustrine sediments. These soils generally have a significant component of vertical flow (although often slowly permeable), leading to water accumulation over time. An upward water flow can be expected in these soils due to evapotranspiration and capillary rise. Consequently, these soils are classified as having low agricultural value and under the Watercourse (Class V) land capability classification. Figure 14 depicts the identified Dundee soil type.

Figure 14: View of the identified Dundee soil form.

4.2.5 Witbank/Johannesburg

These soils are usually disturbed by anthropogenic influences such as intentional transportation and severe physical disturbance, which can be due to any form of urban development (residential and recreational). The diagnostic horizons are no longer arranged in any discernible order or recognisable horizonation as expected in natural soil, sometimes rendering them unsuitable for cultivation. Figure 15 below depicts the disturbed soils associated with the Witbank/Johannesburg formation.

Figure 15: View of the identified Witbank/Johannesburg soils.

Table 4: Soil forms in hectares (ha) occurring within the study area.

Study Area				
Soil Forms	**Area (Ha)**	**Percentage (%)**	**Land Capability**	**Agricultural Potential**
Nkonkoni/Vaalbos	420.4	6.1	Arable (Class IV)	Moderate
Cartref	123.9	1.8	Watercourse (Class V)	Very Low
Dundee	347.7	5.1		
Mispah/Glenrosa	5809.3	84.9	Grazing (Class VI)	Low
Witbank/Johannesburg	140.4	2.1	Wilderness (Class VIII)	Very Low
Total Enclosed	**6841.7**	**100**		

Table 5: Land capability (DAFF, 2017) associated with the soils occurring within the study area.

Soil Form	Land Capability Groups	DAFF (2017) Classification
Nkonkoni/Vaalbos	Arable Land	8. Moderate
Cartref	Watercourse	3. Very Low to Low
Dundee		
Mispah/Glenrosa	Grazing Land	5. Very Low to Low
Witbank/Johannesburg	Residential Areas	1. Very Low

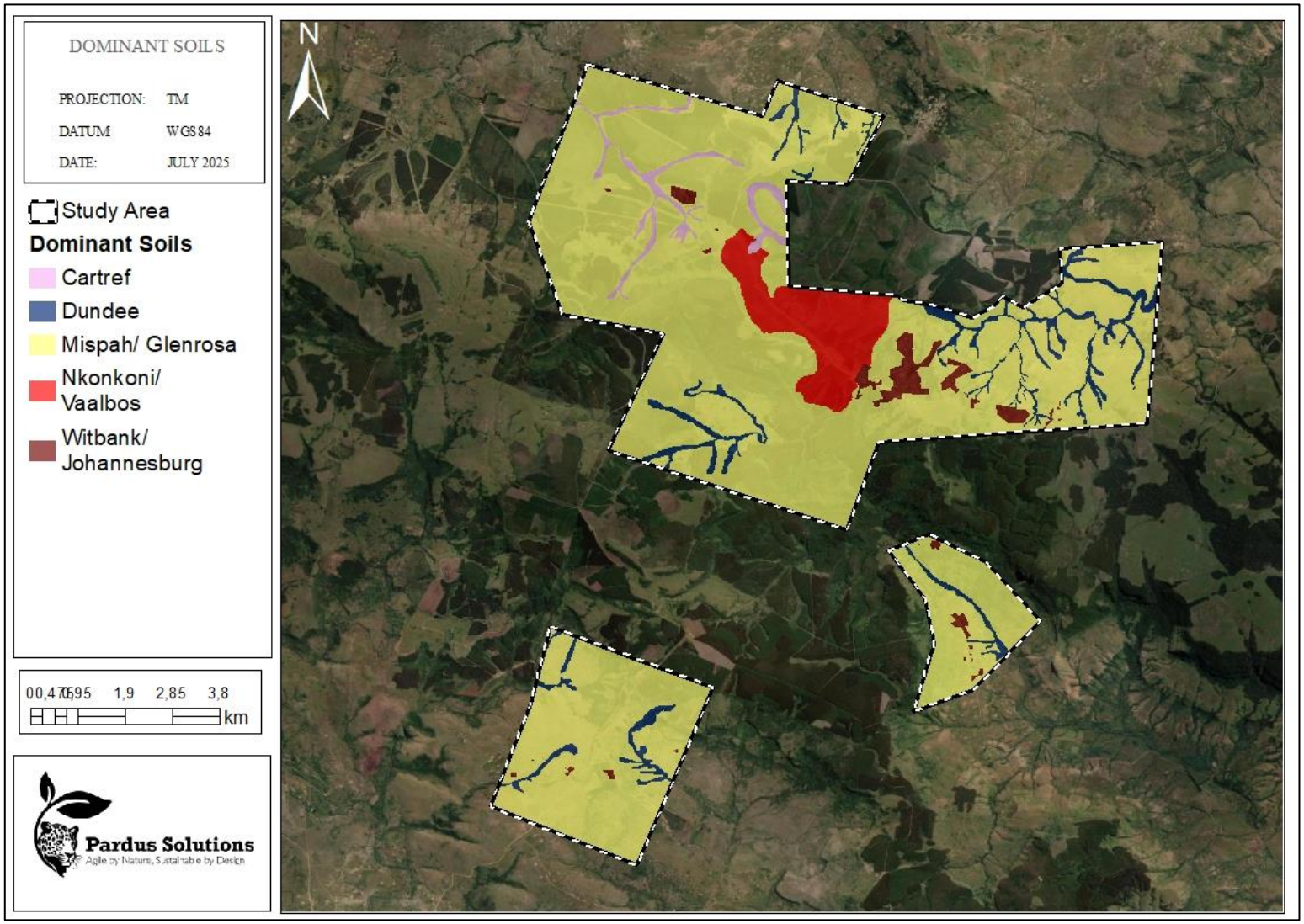

Figure 16: Dominant soils form within the study area.

4.3 Land Capability and Agricultural Potential

Land Capability is defined as the most intensive long-term use of land for rainfed farming, determined by the interaction of climate, soil, and terrain. The soil physical properties with which the agricultural potential for this assessment, agricultural sensitivity, was inferred were in consideration of observed limitations to land use due to physical soil properties and prevailing climatic conditions. Figures 17 and 18 below depicts the land capability associated with the study area, while Figure 19 depicts the agricultural potential.

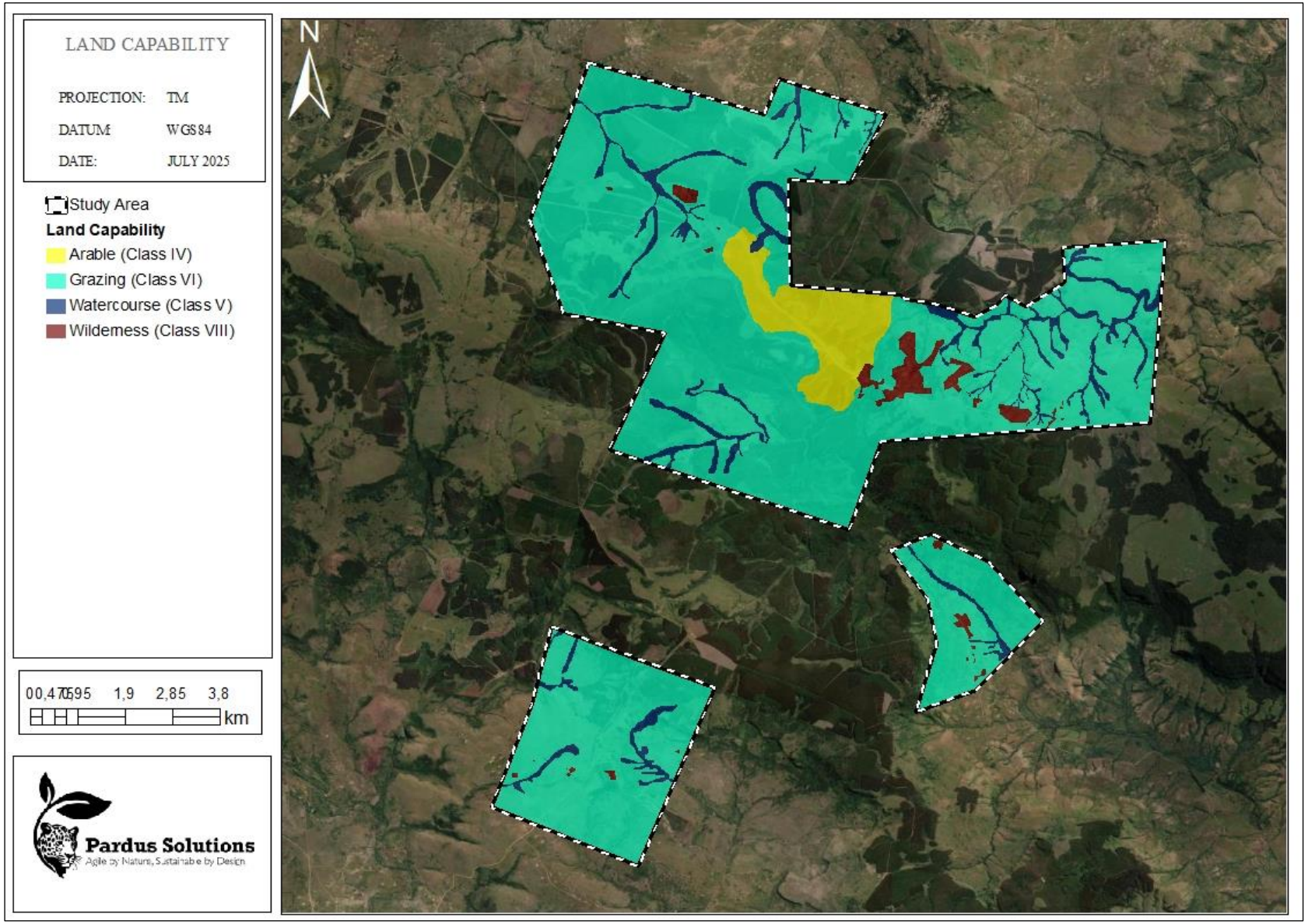

Figure 17: Map depicting land capability of soils within the study area.

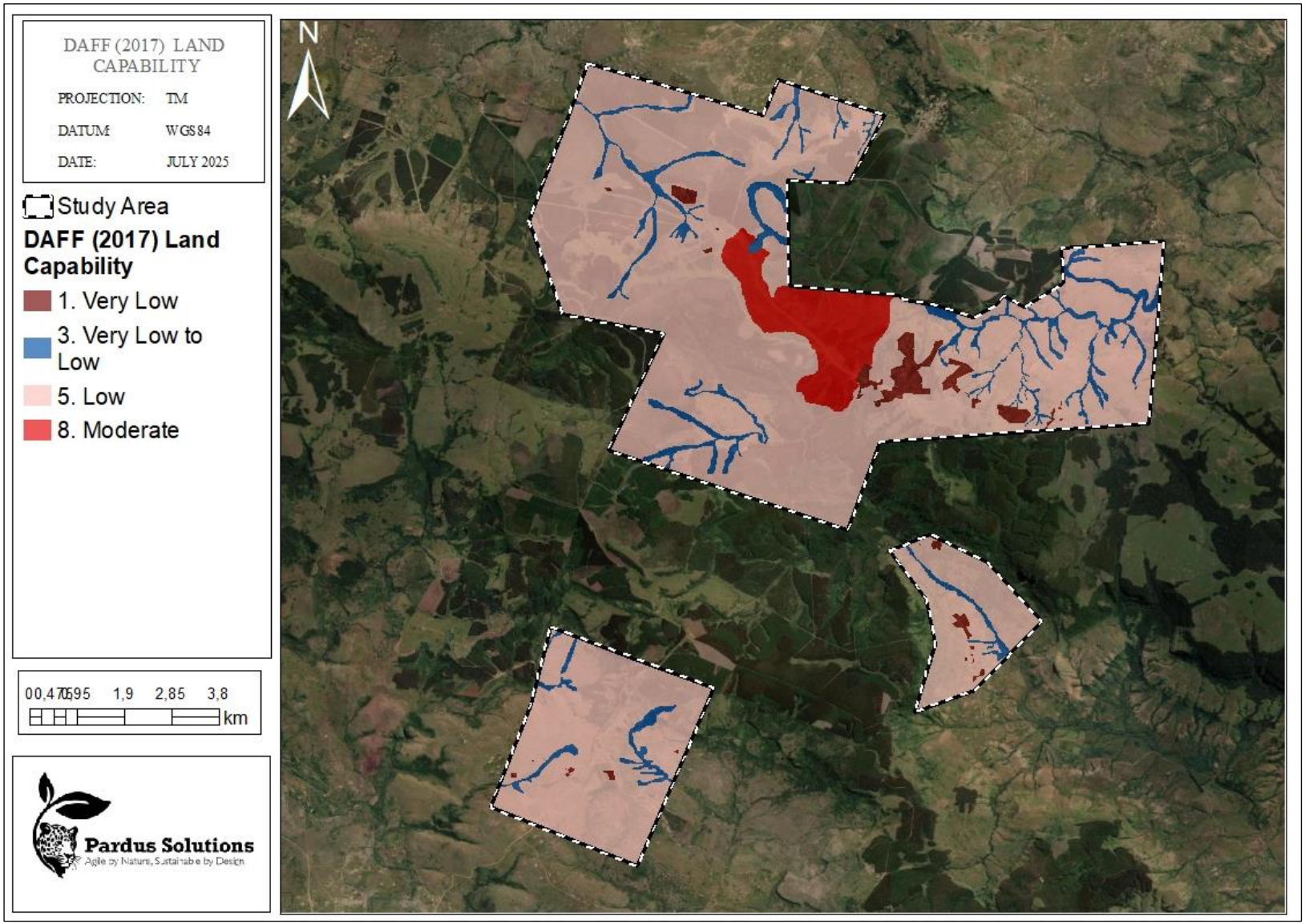

Figure 18: DAFF (2017) land capability classes associated with the northern portion of the study area.

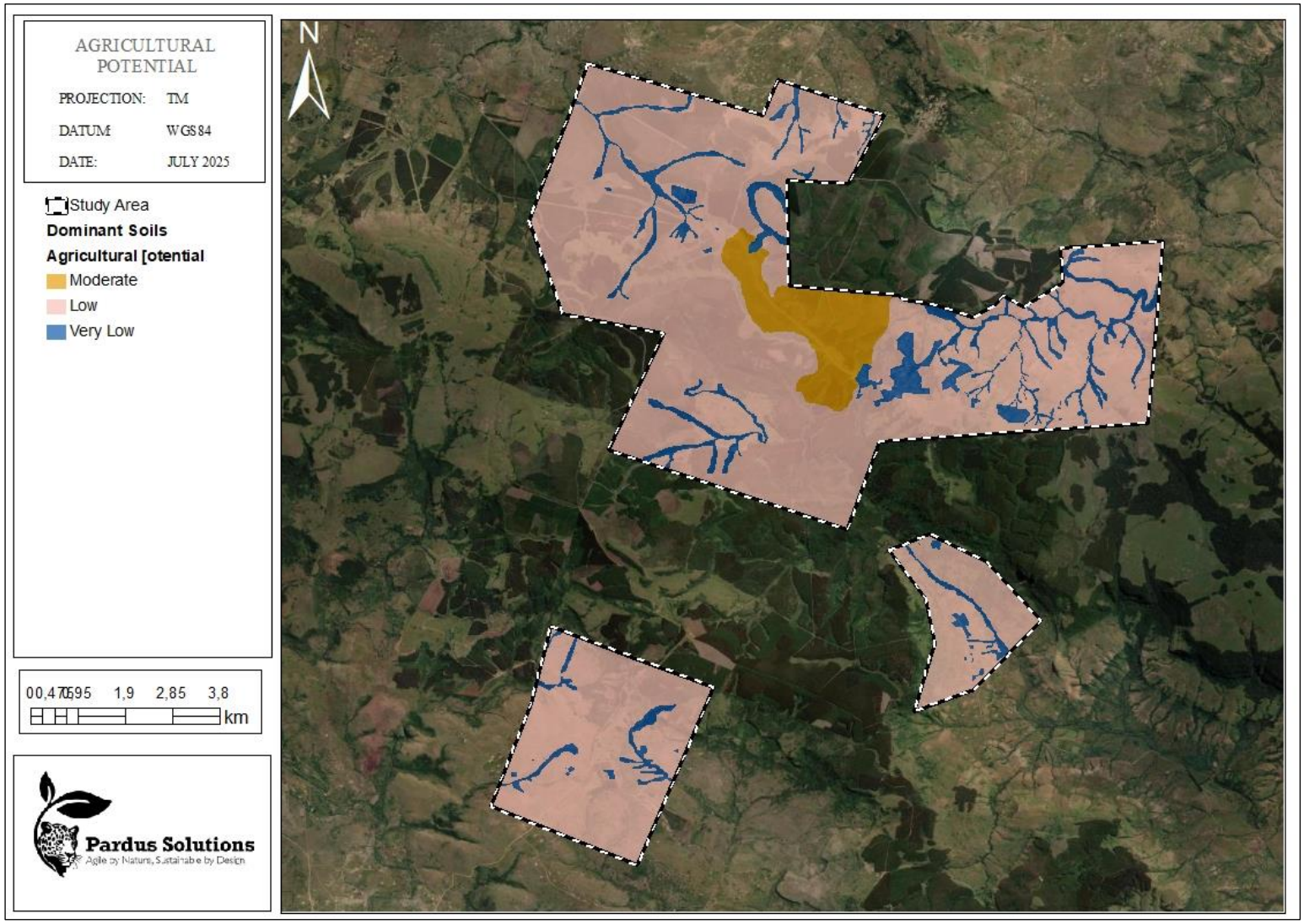

Figure 19: Agricultural potential for soils associated with the study area.

5. IMPACT ASSESSMENT

It should be noted that an Agricultural Compliance Statement is not required to formally rate agricultural impacts using impact assessment tables.

Section 5.1 below presents the significance of the impacts that may occur due to the proposed activities and describes the mitigation required to limit the identified adverse impacts on the identified soils and the agroecosystem on site.

5.1 IMPACT ASSESSMENT PER PROJECT PHASE

5.1.1 Construction Phase (Drilling and Bulk Sampling)

Vegetation clearing and soil stripping before starting drilling and sampling will cause the direct loss of agricultural soil and grazing land. These activities may also lead to the potential loss and degradation of fertile soil through edge effects if not properly managed and mitigated. Besides the immediate impact on active agricultural land, soil quality will be affected by vegetation removal and stockpiling, which could result in increased erosion, dust emission, potential soil contamination, reduced soil organic matter, and changes in soil structure and nutrient cycling. The main planned activities include the following:

- Earthworks (where necessary) in preparation for drilling and sampling will include vegetation clearing from the surface and stripping topsoil (soil excavation). These activities are the most disruptive to natural soil horizon distribution and will impact the current soil hydrological properties and functionality of the soil if not mitigated properly;
- Frequent movement of heavy machinery increases the likelihood of soil contamination from petroleum, oil, and grease substances.
- Other activities in this phase that will impact soil are handling and storing building materials and waste. When not managed properly, these activities have the potential to result in soil pollution.

The disturbance of original soil profiles and horizon sequences during earthworks is considered to be a measurable erosion deterioration. Chemically contaminated water from the mineral processing plant and storage facilities poses a risk to the environment. This impact should always be regarded as high and proper mitigation and/or remediation measures should be in place. Soil compaction will occur due to the heavy vehicles commuting on the existing roads and any newly constructed access roads, which will increase access to the prospecting area. If not rehabilitated, vegetation re-growth is unforeseen and poses a medium risk to the environment.

5.1.2 Closure and Decommissioning Phase

The decommissioning phase will entail sealing and capping the drill holes and removing all prospecting infrastructure and equipment from the processing area. Decommissioning can be considered the reverse of the construction phase, reinstating the natural soil conditions.

The main envisaged decommissioning activities that will impact on soil, land use and land capability include the following:

- Transporting materials away from the site will compact the soil of the existing roads, and fuel and oil spills from vehicles may result in soil chemical pollution.
- Earthworks will include the redistribution of inert waste materials to fill the ponds, ditches, and topsoil to increase the soil surface. These activities will not further impact land use and capability, but may increase soil compaction.
- Other activities in this phase that will impact soil are handling and storing materials, different kinds of waste generated, accidental spills and leaks, and decommissioning activities. When not managed properly, these activities can potentially result in soil pollution.

5.2 Impact Statement and Screening Tool Sensitivity Verification

The study area is proposed to serve as the locality of the proposed mining right permit application and is characterised by shallow miscellaneous and unconsolidated soils which encompass approximately 84.9% of the study area. These soils are more suited for forestry, wildlife conservation and light grazing. Due to steep slopes, these soils are more prone to erosion and the usage of any machinery for tillage purposes may be difficult. These soils can be transformed into cultivatable land through terracing and removal of stones by hand, which can be costly and labour intensive. In addition, the existing grazing activities can be relocated to other portions of the farm area, and thus, no grazing activities will be impacted.

The anticipated impact of the proposed prospecting right is expected to result in reversible effects on soils, primarily due to the limited scale and nature of the activities involved. This assessment remains valid, provided that the mitigation measures outlined in this document are diligently implemented. From a soil and land capability perspective, the cumulative loss is projected to be of low significance, especially with these safeguards in place. Notably, the absence of large-scale agricultural operations and only the modest practices of subsistence farming have influenced this conclusion. Nevertheless, it is essential to acknowledge that soils within the study area will inevitably undergo various forms of degradation stemming from the different operations that will occur during both the construction and operational phases of the proposed prospecting activities.

In this case, the study area is considered below the threshold for needing conservation as agricultural production land due to its limitations that make it unsuitable for cropping. If this land were used for non-agricultural purposes, it would lead to minimal loss of agricultural production potential in relation to national food security. As a result,

the overall adverse agricultural impact of the development (loss of future agricultural production potential) is regarded as having low significance. From an agricultural impact point of view, it is recommended that the proposed development be approved. The conclusion of this assessment on the acceptability of the proposed development and the recommendation for its approval subject to adhering to the mitigation measures outlined in the document.

In accordance with the procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of Sections 24(5)(a) and (h) and 44 of the NEMA, 1998, when applying for environmental authorisation the current use of the land and the environmental sensitivity of the site under consideration as identified by the national web-based environmental screening tool, must be confirmed by undertaking a site sensitivity verification.
The outcome of this site sensitivity verification is to:

- Confirm or dispute the current use of the land and the environmental sensitivity as identified by the screening tool; and
- Motivate and provide evidence of either the verified or different use of the land and environmental sensitivity of the site.

The screening tool analysis was conducted, which presented the findings as the impact on agricultural resources being of very high sensitivity in terms of agricultural sensitivity. Based on the outcomes of the field assessment, this was found to be of a low significant impact due to the dominant soil forms, which are not high-potential agricultural soils due to various limitations, including shallower depth and requiring intensive management strategies to cultivate. The land capability of the surrounding soils and the agricultural potential are very low to low due to inappropriate slope conditions, which may not allow for intensive commercial agricultural practices. The allocated sensitivities for the agricultural theme are presented on Table 6 below.

Table 6: Summary of the screening tool vs specialist-assigned sensitivities.

SITE SENSITIVITY VERIFICATION			
	Screening Tool		**Site Verification Outcome**
Study Area	Very High Sensitivity		Low Sensitivity

It is the opinion of the specialist that this study provides the relevant information required for the Environmental Impact Assessment phase of the project to ensure that appropriate consideration of the agricultural resources in the study area are made in support of the principles of Integrated Environmental Management (IEM) and sustainable development.

5.2.1 Cumulative Impacts

The protocols for agriculture necessitate specific evaluations for environmental approval to assess cumulative effects. The cumulative impact of a project is the overall consequence it will have when its effect is combined with the gradual impacts of previous, current, or anticipated future activities that will influence the same environment. The potential cumulative long-term impact on agriculture involves the regional loss, including degradation, of future agricultural production potential, highlighting the need for careful planning and sustainable practices to safeguard agricultural productivity.

Based on the assessment, the potential impact on future agricultural production is moderate. It is not anticipated to have an unacceptably negative effect on the region's agricultural production capability. As such, avoidance of placing the non-geographically bound infrastructure on actively cultivated soils should take precedence to allow for the ongoing cultivation activities to exist concurrently within the mine although the grazing component will be impacted. The residual impact must be offset as best as possible by improving the degraded grasslands to a higher class for the purposes of improving the grazing capacity. If mitigatory conditions can be met (particularly the removal of non-geographically bound infrastructure within actively cultivated areas such as overburden stockpiles, sorting plant and office areas) the proposed development and associated activities can potentially be considered for authorisation by the competent authority.

5.2.2 Micro Siting and Confirmation of Linear Activity

The agricultural protocol necessitates the verification of the implementation of all practical measures through micro-siting to reduce the fragmentation and disturbance of agricultural activities. This involves carefully planning the location and layout of agricultural infrastructure and operations to minimise any negative impact on the surrounding agricultural activities. As previously discussed, micro-siting within the development footprint area will not significantly impact agriculture and disturbance.

The agricultural protocol also mandates that, for activities carried out in a linear fashion, the land must be restored to its original state within two years of the completion of the construction phase. This requirement only applies to the haul roads and access roads line within the project. It has been verified that the land adjacent to the roads, not occupied by other infrastructure, can be returned to its original agricultural productivity within two years of construction. However, it should be noted that the roads will remain in place throughout the operational lifetime of the mining activities.

6 INTERGRATED MITIGATION MEASURES

The Environmental Impact Assessment (EIA) plays a crucial role in evaluating the potential environmental impacts of the proposed project. It is essential that the EIA thoroughly examines the environmental implications, taking into account both the impacts with and without mitigation measures. This comprehensive assessment is vital to

effectively minimize any adverse effects on the soil resources in the area. Furthermore, it is imperative to adhere to the mitigation hierarchy, as illustrated in Figure 20, to ensure that the principles of the National Environmental Management Act (NEMA) are effectively applied.

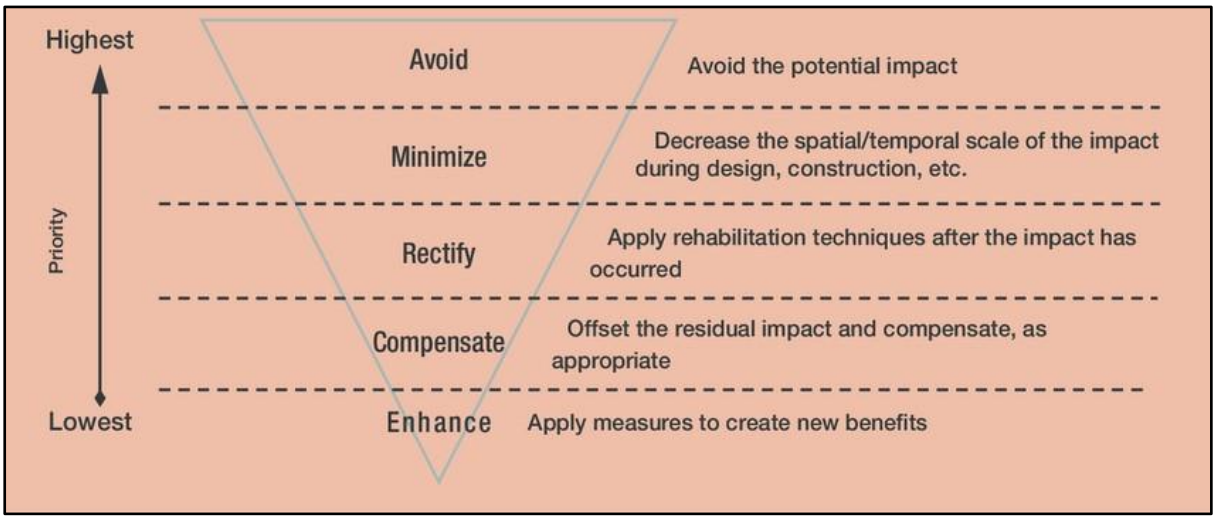

Figure 20: Mitigation hierarchy.

The principles of NEMA are critical for attaining sustainable development as they recognize the need to incorporate social, economic, and ecological factors into decision-making processes concerning the environment. These principles are relevant to all decisions concerning the understanding and application of NEMA and other regulations related to environmental management and protection. Hence, it is essential for the EIA to consider the NEMA principles.

6.1 Management of Loss of Land Capability

- Direct surface disturbance of the identified arable soils can be avoided where possible to minimise loss of arable soils;
- Avoid construction on the active agricultural soils where feasible;
- Minimise the development footprint within the actively cultivated soils;
- The footprint areas should be lightly ripped to alleviate compaction;
- Limit removal of vegetation to demarcated areas only;
- Limit earthworks and vehicle movement to demarcated paths and areas.

6.2 Soil Compaction Management

- Soil Compaction is usually greatest when soils are moist, so soils should be stripped when moisture content is as low as possible;
- Heavy equipment movement over replaced soils should be minimised;

- Minimise compaction during smoothing of replaced soils by using dozers rather than graders; and
- Following placement, compacted soils should be ripped to full rooting depth (30cm as the bare minimum seedbed) to allow penetration of plant root.

6.3 Soil Contamination Management

- Contamination prevention measures should be addressed in the Environmental Management Programme (EMPr) for the proposed development, and this should be always implemented and made available and accessible to the contractors and construction crew conducting the works on site for reference;
- Provide an adequate number of portable toilets available for on-site workers and ensure regular sewage collection for disposal at wastewater treatment works;
- A spill prevention and emergency spill response plan, as well as dust suppression, and fire prevention plans should also be compiled to guide the construction works;
- An emergency response contingency plan should be put in place to address clean-up measures should a spill and/or a leak occur, as well as preventative measures to prevent contamination; and
- Burying of any waste including rubble, domestic waste, empty containers on the site should be strictly prohibited and all construction rubble waste must be removed to an approved disposal site.

6.4 Soil Erosion and Dust Management

- Removal of vegetation must be avoided until such time as soil stripping is required and similarly exposed surfaces, must be re-vegetated or stabilised as soon as is practically possible;
- All excavation/construction vehicles should be in good condition and inspected regularly to ensure there are no chemical spills (diesel/oil) which will negatively impact the receiving environment;
- After the powerline installation, the ground should be seeded with an indigenous grass or other native cover;
- Vegetation clearance and commencement of construction activities can be scheduled to coincide with low rainfall conditions when the erosive stormwater and wind are anticipated to be low whenever possible;
- Avoid vegetation clearance prior to periods of prolonged inactivity;
- All disturbed areas adjacent to the proposed development areas should be re-vegetated with an indigenous grass mix or vegetation mix, if necessary, to re-establish a protective cover, to minimise soil erosion;
- Temporary erosion control measures should be used to protect the disturbed soils during the construction phase until adequate vegetation has established.

7 CONCLUSION

Pardus Solutions (Pty) Ltd was appointed by Naira Environmental Solutions (Pty) Ltd to conduct a soil, land use, and land capability study as part of the Environmental Authorisation (EA) process for the application for for a Prospecting Right in terms of Section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA. The proposed area for the prospecting is located

The study area is proposed to serve as the locality of the proposed mining right permit application and is characterised by shallow miscellaneous and unconsolidated soils which encompass approximately 84.9% of the study area. These soils are more suited for forestry, wildlife conservation and light grazing. Due to steep slopes, these soils are more prone to erosion and the usage of any machinery for tillage purposes may be difficult. These soils can be transformed into cultivatable land through terracing and removal of stones by hand, which can be costly and labour intensive. In addition, the existing grazing activities can be relocated to other portions of the farm area, and thus, no grazing activities will be impacted.

The anticipated impact of the proposed prospecting right is expected to result in reversible effects on soils, primarily due to the limited scale and nature of the activities involved. This assessment remains valid, provided that the mitigation measures outlined in this document are diligently implemented. From a soil and land capability perspective, the cumulative loss is projected to be of low significance, especially with these safeguards in place. Notably, the absence of large-scale agricultural operations and only the modest practices of subsistence farming have influenced this conclusion. Nevertheless, it is essential to acknowledge that soils within the study area will inevitably undergo various forms of degradation stemming from the different operations that will occur during both the construction and operational phases of the proposed prospecting activities.

Based on the assessment, the potential impact on future agricultural production is moderate. It is not anticipated to have an unacceptably negative effect on the region's agricultural production capability. As such, avoidance of placing the non-geographically bound infrastructure on actively cultivated soils should take precedence to allow for the ongoing cultivation activities to exist concurrently within the mine although the grazing component will be impacted. The residual impact must be offset as best as possible by improving the degraded grasslands to a higher class for the purposes of improving the grazing capacity. If mitigatory conditions can be met (particularly the removal of non-geographically bound infrastructure within actively cultivated areas such as overburden stockpiles, sorting plant and office areas) the proposed development and associated activities can potentially be considered for authorisation by the competent authority.

In accordance with the procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of Sections 24(5)(a) and (h) and 44 of the NEMA, 1998, when applying for environmental authorisation the current use of the land and the environmental sensitivity of the site under consideration as identified by the national web-based environmental screening tool, must be confirmed by undertaking a site sensitivity verification.

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Table A: Summary of the screening tool vs specialist-assigned sensitivities.

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APPENDIX A: INDEMNITY

- This report is based on survey and assessment techniques limited by time and budgetary constraints relevant to the type and level of investigation undertaken.
- This report is based on a desktop investigation using available information and data related to the site to be affected, *in situ* fieldwork, surveys, and assessments, and the specialist's best scientific and professional knowledge.
- The Precautionary Principle has been applied throughout this investigation.
- The findings, results, observations, conclusions, and recommendations given in this report are based on the specialist's best scientific and professional knowledge as well as information available at the time of the study.
- Additional information may become known or available later in the process for which no allowance could have been made at the time of this report.
- The specialist reserves the right to modify this report, recommendations, and conclusions at any stage should additional information become available.
- Information and recommendations in this report cannot be applied to any other area without proper investigation.
- This report, in its entirety or any portion thereof, may not be altered in any manner or form or for any purpose without the specific and written consent of the specialist as specified above.
- Acceptance of this report, in any physical or digital form, serves to confirm acknowledgment of these terms and liabilities.

Tshiamo Setsipane

29 July 2025

APPENDIX B: CURRICULUM VITAE OF SPECIALISTS

CURRICULUM VITAE OF TSHIAMO SETSIPANE

PROFESSIONAL EXPERIENCE

Soil Science Consultant

- Conducting Soil, Land Use and Land Capability Assessments:
  - Assess existing information for rainfall data and current land uses.
  - Conduct a desktop assessment within the study area using the digital satellite imagery and other suitable digital aids.
  - A soil classification survey and agricultural potential will be conducted within the proposed development area.
  - A soil classification survey and agricultural potential will be conducted within the proposed development area.
  - Provide recommended mitigation measures to implement to manage the anticipated impacts and to comply with the applicable legislations.
  - Compile a report on the findings of the assessment and presented in an electronic format.
- Conducting Hydropedological Impact Surveys:
  - Identify dominant hillslopes (from crest to stream) of the project area using terrain analysis.
  - Conduct a transect soil survey on each of the identified hillslope.
  - Hydrological behaviour of the identified hillslope described according to the identified hydropedological groups;
  - Graphical representation of the dominant and sub-dominant flowpaths at hillslope scale prior to development and post development.
  - The impact of the proposed development on the hydropedological behaviour described in a report format.
  - Quantification of hydropedological fluxes using the Soil and Water Analysis Tool (SWAT+) to determine the losses to the wetland systems though the proposed project
- Conducting Land Contamination Assessments and Soil Monitoring Assessments:
  - Assessments of historic and current storage of hazardous waste and materials on soils.
  - Topsoil stockpile quality assessment for future usage.
  - Monitoring programme to determine the dust suppression impact on soil chemical parameters.

EDUCATION

- M.Sc. (Agric): Soil Science **01/2016– 03/2019**
  - Dissertation: Characterisation of hydropedological processes and properties of a sandstone and a tillite hillslope, Kwa-Zulu Natal, South Africa.
  - Graduated *Cum-Laude*.
- B.Sc. (Agric) Honours: Soil Science **01/2014 – 11/2014**
  - Majored in soil fertility, soil physics, soil geography and soil chemistry.
  - Research Project: Soil as an indicator of soil water regime.
- B.Sc. (Agric): Soil Science and Agrometeorology **2010 – 11/2013**
  - Majored in soil science and agrometeorology.
  - Minored in agronomy and plant pathology.

PROFESSIONAL MEMBERSHIP AND AFFILIATION

- Professional Natural Scientist with South African Council for Natural Scientific Professions (SACNASP) Registered, 11/2015 – Current
- Member of the Soil Science Society of South Africa (SSSSA)
- Member, South African Soil Surveyors Organization (SASSO)
- Member of the South African Wetland Society (SAW

APPENDIX C: SPECIALIST DECLARATION

forestry, fisheries & the environment

Department:
Forestry, Fisheries and the Environment
REPUBLIC OF SOUTH AFRICA

Private Bag X447, Pretoria, 0001, Environment House, 473 Steve Biko Road, Pretoria, 0002 Tel: +27 12 399 9000, Fax: +27 86 625 1042

SPECIALIST DECLARATION FORM – AUGUST 2023

Specialist Declaration form for assessments undertaken for 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)

REPORT TITLE
Site Sensitivity Verification and Soil, Land Use, And Agricultural Compliance Statement: For the Proposed Prospecting Rights Within the Abaqulusi Local Municipality In KwaZulu-Natal Province.

Kindly note the following:

1. This form must always be used for assessment that are in support of 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 August 2023. 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.dffe.gov.za/documents/forms.
3. An electronic copy of the signed declaration form must be appended to all Draft and Final Reports submitted to the department for consideration.
4. The specialist must be aware of and comply with *'the Procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the act, when applying for environmental authorisation - GN 320/2020)'*, where applicable.

1. SPECIALIST INFORMATION

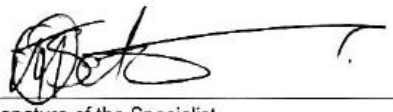
Title of Specialist Assessment	Agricultural Impact Assessment
Specialist Company Name	Pardus AgriEco Solutions Pty Ltd
Specialist Name	Tshiamo Setsipane
Specialist Identity Number	9209155133083
Specialist Qualifications:	M.Sc (Agric): Soil Science
Professional affiliation/registration:	SACNASP
Physical address:	University of Fort Hare, Alice, 5700, South Africa
Postal address:	University of Fort Hare, Alice, 5700, South Africa
Postal address	University of Fort Hare, Alice, 5700, South Africa
Telephone	0617105481
Cell phone	0617105481
E-mail	tshiamo@envirosolum.co.za

SPECIALIST DECLARATION FORM – AUGUST 2025

2. DECLARATION BY THE SPECIALIST

I, Tshiamo Setsipane declare that –

- I act as the independent specialist in this application;
- I am aware of the procedures and requirements for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the National Environmental Management Act (NEMA), 1998, as amended, when applying for environmental authorisation which were promulgated in Government Notice No. 320 of 20 March 2020 (i.e. "the Protocols") and in Government Notice No. 1150 of 30 October 2020.
- 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 NEMA Act.



Signature of the Specialist

Enviro-Solum Consulting Pty Ltd

Name of Company:

29 Jul 2025

Date

SPECIALIST DECLARATION FORM – AUGUST 2023

3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, _ Tshiamo Setsipane_____, 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

Pardus AgriEco Solutions Pty Ltd
Name of Company

29 July 2025
Date

Click or tap here to enter text.
Signature of the Commissioner of Oaths

29 Jul 2025
Date

SOUTH AFRICAN POLICE SERVICE
SUPPLY CHAIN MANAGEMENT
2025 -07- 29
MONDEOR SAPS
SOUTH AFRICAN POLICE SERVICE