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WETLAND DELINEATION & FUNCTIONAL ASSESSMENT

THE KAMBREEK PROSPECTING RIGHT APPLICATION SITE, WITHIN THE SANDFONTEIN REGION, KHAI-MAI LOCAL MUNICIPALITY, NAMAKWA DISTRICT MUNICIPALITY, NORTHERN CAPE

20th May 2024

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DECLARATION (AUTHOR)

I, **Bhavna Ramdhani,** declare that -

- I act as the independent specialist in this matter;
- I do not have and will not have any vested interest (either business, financial, personal or other) in the undertaking of the proposed activity, other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2014 (as amended in 2017);
- I performed the work relating to the application in an objective manner, even if it results in views and findings that are not favourable to the applicant;
- I declare that there were no circumstances that compromised my objectivity in performing such work;
- I have expertise in conducting the specialist assessment relevant to this application, including knowledge of the National Environmental Management Act (Act 107 of 1998) (NEMA), regulations and any guidelines that have relevance to the proposed activity;
- I comply with the NEMA Act, regulations and all other applicable legislation; and
- I disclosed 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 report are true and correct.
- I am aware that a person is guilty of an offence in terms of Regulation 48 (1) of the EIA Regulations, 2014, if that person provides incorrect or misleading information. A person who is convicted of an offence in terms of sub-regulation 48(1) (a)-(e) is liable to the penalties as contemplated in section 49B (1) of the National Environmental Management Act, 1998 (Act 107 of 1998).

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DECLARATION (REVIEWER)

I, **Bryan Paul ,** declare that -

- I act as the independent specialist in this matter;
- I do not have and will not have any vested interest (either business, financial, personal or other) in the undertaking of the proposed activity, other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2014;
- 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 National Environmental Management Act (Act 107 of 1998) (NEMA), regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the NEMA Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity; and
- 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 report are true and correct.

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INDEMNITY

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1. INTRODUCTION

1.1 Project Background & Locality

Afzelia Environmental Consultants (Pty) Ltd. was appointed by Greenmined Environmental (Pty) Ltd. to conduct a wetland delineation and functional assessment (WDFA) for the Kambreek prospecting right application site. The study area is located within the Sandfontein region, in the Khai-Mai Local Municipality, Namakwa District Municipality, and province of Northern Cape, South Africa. The prospecting site encompasses a portion of Klein Pella Farm, which is the largest date farm in South Africa, with the main Orange River situated towards the north. The Kambreek prospect right site will be assessed, via exploratory methods, for the following minerals including:

- Lithium;
- Iron;
- Zinc;
- Rare Earths;
- Lead;
- Nickel; and
- Copper Ore.

A total of ten (10) proposed borehole cores will be drilled to extract the material for analysis. The layout for the proposed boreholes has not yet been finalised and represent an overview, which may be subject to change in the future. The drilling range of each proposed borehole will not exceed an area of 1m x 1m ($1m^2$) in size. Majority of the Kambreek prospect right site was assessed, however some regions were inaccessible due to mountainous terrain and were evaluated via desktop processes.

All forms of development impact on the natural environment to some extent. In general, the rapid rate of urbanisation, for instance, has allowed for the progressive degradation and elimination of wetland ecosystems due to direct and indirect human induced activities. Therefore, in order to protect these pristine natural resources, responsibility falls to the relevant government authorities which enforce national legislation (e.g. CARA, DREM and NEMA). Such legislation generally calls for landowners to ensure the protection, utilisation, development, conservation and if necessary, the rehabilitation of such valuable ecosystems.

This specialist wetland assessment was therefore undertaken to identify the location and extent of wetlands within the regulated 500m buffer of the study site; determine the functionality and health status of the “at risk’ wetlands and identify the impacts of the proposed activity on the surrounding wetlands. The information gathered from the aforementioned was then used to determine whether General Authorisation (GA) or a full a Water Use License Application (WULA) or No Authorization is required for the proposed activity to take place.

After the wetland and other watercourse environments within the proposed development site and the surrounding 500m buffer were identified and delineated, they were assessed for potential “at risk” status as a direct consequence of the proposed activity. In this study, an individual wetland was discovered within the surrounding proposed development area.

1.2 Wetland Characteristics

Wetlands can be described as areas of inundated land or saturated for extended periods of time. They are intermediate zones between terrestrial lands and aquatic ecosystems, usually occurring when the water table is located just below the surface. Certain plants have adapted to wetland conditions such as growing in anaerobic soil (Ramachandra and Kumar, 2008). The space that exists between soils particles usually become filled with water due to the soil becoming increasingly wet. A typical characteristic of wetlands is their ability to store water and allow drainage to occur at an extremely slow rate, hence they are often waterlogged. Anaerobic conditions usually occur in waterlogged wetland soils due to the rapid usage of oxygen by organisms and plant roots. Wetlands are therefore characterized by soil saturation together with redoxymorphic features; high clay and organic matter content in soils; a suite of characteristic wetland vegetation types and particular topographic settings in which they occur.

Wetlands vary widely because of regional and local differences in soils, topography, climate, hydrology, water chemistry, vegetation and other factors, including human disturbance. In the identification of wetland areas more than one distinguishing characteristic must be present before positive identification of wetlands is accomplished.

1.3 The importance of wetlands

Wetlands are considered to be one of the most valued and important ecosystems as they provide a plethora of benefits, not only to the natural environment, but to humans as well (Ramsar Convention on Wetlands, 2018). In particular, wetlands have been studied to improve water quality, often referred to as the 'kidneys of the Earth' and serve as reservoirs which allow for the gradual stable release of water throughout the year. This also proves as an added benefit during flood occurrences as wetlands play a vital role in mitigating flooding by decreasing their initial velocity by absorbing excess flood waters, as well as trapping suspended solids.

1.4 Scope of work

The aim of this desktop wetland delineation was to identify and demarcate wetland environments within the proposed study site and the surrounding areas. The details pertaining to the scope of work include the following:

Wetland Delineation, incorporating the following:

- ✓ To identify and delineate potential wetland and riparian environments within the study site and in the 500m buffer of the site based on aerial photography and available wetland/river coverages *via* a desktop survey;
- ✓ To conduct a comprehensive field survey to identify and delineate wetlands using the Department of Water Affairs & Forestry guideline manual (DWAF, 2005);
- ✓ To classify and describe the wetlands/riparian areas affected by the proposed development using the *National Wetland Classification System for Wetlands and other Aquatic Ecosystems in South Africa* (Ollis *et al.,* 2013);
- ✓ To undertake a rapid desktop aquatic screening and risk assessment to determine which of the desktop delineated wetlands are likely to be affected by the proposed development;

- ✓ For wetlands assessed to be 'at risk' of the proposed development:
  - To establish the present Ecological State (PES) of the affected wetlands using a Level 1 WET-Health assessment tool (Macfarlane *et al.,* 2008);
  - To assess the importance of the affected wetland areas in providing ecosystem goods and services using a Level 2 WET-EcoServices assessment tool (Kotze *et al.,* 2009);
  - To assess the Ecological Importance and Sensitivity (EIS) of the affected wetland areas (Kleynhans, 1999);
- ✓ To identify and describe the potential aquatic ecological impacts associated with the proposed development; using the risk assessment tool (DWS, 2015);
- ✓ To provide wetland buffer zone recommendations based on best-practice guidelines and available buffer zone guidelines;
- ✓ To provide suitable recommendation and mitigation measures for the wetland environments to maintain and ideally improve the wetland ecological health status and provision of eco-services.

1.5 Assumptions and limitations

- ✓ Majority of the landscape consisted of mountainous terrain which was inaccessible and therefore only areas that could be traversed were assessed for the purpose of this report.

- ✓ This study is considered as a once off assessment, which can only take into consideration the current condition with some speculation of historical events based on evidence observed on field and with the aid of satellite imagery. Since vegetation and habitats often vary temporally and spatially, there must be recognition of fact that certain aspects or features may not have been present on the day the site visit;

- ✓ Any hydrogeomorphic unit on site and in the buffer would be assessed in their entirety, even if it included sections of artificial wetland that were inaccessible; the latter would be assessed from aerial imagery with limited infield verification and assumed to be accurate within specialist expertise;

- ✓ All delineation verification is done using a GPS system. The precision of such systems is generally limited to 5m and therefore this error must be taken into account when utilising the GPS coordinates;

- ✓ Whilst the assessment techniques applied in this report are used in order to standardise and 'objectify' the assessment of the systems' function, potential impacts and services, it must be noted that much of the information is subjectively collected based on the assessor's experience and training. The assessor will, if additional information or counter arguments are provided and verified, hold the right to amend the report if need be;

- ✓ Monitoring and management of any wetland impacts/ remediation/ rehabilitation are advised in accordance with best practice.

2. LEGISLATIVE FRAMEWORK

The table below outlines the national and international legislation, together with a short description of the relevant portions application to wetlands:

Table 2.1: A review of the applicable guidelines under international and national legislation.

INTERNATIONAL LEGISLATION	
Name	**Short Description and Relevant section/s**
RAMSAR Convention	Importance is placed on the ecological, economic and social feasibility of wetland restoration programmes in order to protect wetlands by implementing initiatives to maintain or improve the state of wetland resources
Convention on Biological Diversity	An important tool for the in-situ conservation of biodiversity is wetland rehabilitation. Countries are to rehabilitate and restore degraded ecosystems and promote the recovery of threatened species through the formulation and implementation of appropriate plans and strategies
United Nations Convention to Combat Desertification	Countries are to respond to land degradation and the effects of drought, which includes the rehabilitation, conservation and sustainable management of land and water resources. South Africa has responded by developing a National Action Plan which aims to implement current and future policies that affect the natural resource management and rural development as well as to establish partnerships between all sectors this includes government departments, overseas development agencies, the private sector and non-governmental organizations
New Partnership for Africa's Development (NEPAD)	One of the eight themes under the environmental initiative is wetland conservation
The World Summit on Sustainable Development (WSSD)	The implementation plan places emphasis on the actions that reduce the risk of flooding in drought-vulnerable countries through promoting the restoration and protection of wetlands and watersheds

Table 2.2: A review of the applicable guidelines under national legislation

NATIONAL LEGISLATION	
Name	**Short Description and Relevant section/s**
South African Constitution No. 108 of 1996	The constitution is the overarching framework of South African law. It provides a legal foundation for the existence of the republic, outlines the rights and responsibilities of South African citizens and it defines the structure of government Chapter 2- Bill of rights (Section 24) Everyone has a right to an environment that is not harmful to their health or wellbeing and is protected through reasonable legislative or other measures. (Section 27) National government is the custodian of all the country's water resources
National Environmental Management Act (NEMA) No. 107 of 1998	This is an overarching statute regulating various aspects of natural resource use, integrating environmental management and pollution control. It provides principles and guidelines for sensitive, dynamic or stressed ecosystems i.e. wetlands. NEMA effectively promotes sustainable development into all planning and decision-making processes and adopts principles such as the 'precautionary approach,' 'polluter pays approach,' and requires that environmental responsibility be taken throughout the lifecycle of a project. Chapter 5 – Integrated Environmental Management (Section 24) provides for the prohibition, restriction and control of activities which are likely to have detrimental effects on the environment. The activities listed in the environmental impact assessment regulations that require assessment and environmental assessment have been promulgated in 2010 under NEMA. A number of activities listed in the regulations have relevance to wetland environments including a range of activities within 32m of a water course (including wetlands)
National Water Act No. 36 of 1998	This act provides a framework to protect the country's water resources this includes rivers, streams, estuaries, dams, wetlands and groundwater as well as the sustainable management thereof. The act provides guidelines and procedures on the protection, management and use of water resources in a controlled and integrated manner. Chapter 4 – Use of water - Deals with setting the basis for regulating water usage as well as details of various types of licensed and unlicensed entitlements to the use of water. Water use has a broad definition in the Water Act and requires that any activities with a potential impact on wetlands (within a parameter of 500m upstream or downstream of a wetland) be authorized.

	Chapter 19 (1) - "An owner of land, a person in control of land or a person who occupies or uses the land on which a) any activity or process is or was performed or undertaken; which caused or likely to cause pollution of a water resource, must take all reasonable measures to prevent any such pollution from occurring, continuing or recurring." General Authorisations (GAs) – have been promulgated under the National water Act and were published under GNR 398 of 2004. Any uses of water which do not meet the requirements of Schedule 1 or GAs, require a license which should be obtained from the Department of Water Affairs and Forestry
National Environmental Management Act: Biodiversity Act No. 10 of 2004	This act provides the management and conservation of the country's biodiversity within the framework of NEMA 1998. The sustainable use of indigenous biological resources and the protection of species and ecosystems that warrant natural protection as well as to ensure the fair and equitable sharing of the benefits arising from the use of biological resources.
Conservation of Agriculture Resource Act (CARA) No. 43 of 1983	This act deals with control of the over-utilization of South Africa's natural agricultural resources, and to promote the conservation of soil and water resources and natural vegetation. This includes wetland systems and requires authorizations to be obtained for a range of impacts associated with cultivation of wetland areas

3. METHODS

3.1 Desktop Assessment

A desktop study was initially undertaken to garner as much prior understanding of the general physiographic characteristics of the study area as possible. This was achieved by sourcing and utilizing all relevant GIS data available, such as data on the topographical layout, vegetation characteristics, fluvial hydrology, ecoregion classification, Critical Biodiversity Areas (CBA), NFEPA's and land uses occurring in the region. The details of these various desktop data details are presented in Section 4: Study Area. Further desktop assessment was thereafter conducted covering the 500m regulated buffer of the study area to identify potential wetland and fluvial areas of interest within the site. This was accomplished via satellite imagery from Google Earth® and shape files obtained from the South African National Biodiversity Institute (SANBI) (Ollis *et al*., 2013). The delineation of the wetland and riparian boundaries were therefore first conducted at desktop level and later verified *via* a field survey.

3.2 Field Assessment

Comprehensive wetland delineation field survey was undertaken on the 9th and 10th of April 2024, to accurately delineate boundaries of wetland environments found within the proposed development site and surrounding 500m buffer area (Figure 5.1). The field survey, conducted by the Afzelia team, comprised of augering and logging of sediment cores to 50cm or slightly greater depths, assessing targeted areas identified from aerial photographs and on-site visual identification. The field survey thus included identifying wetland and riparian areas, delineating the outer boundaries of the wetland/riparian areas and classifying them. It should be noted that areas not accessible were delineated at a desktop level using the best available spatial data.

3.3 Wetland delineation

Four specific wetland indicators were used to identify/verify wetland areas:

- ✓ terrain unit,
- ✓ vegetation (Table 3.1),
- ✓ soil: texture (sand & clay); colour (hue, chroma & value); organic matter and;
- ✓ degree of saturation.

The wetland delineation procedure identifies the outer edge of the temporary wetland zone, marking the boundary between the aquatic and adjacent terrestrial areas. The wetland delineation field verification began at the lowest lying point of the wetland and proceeded outwards into the permanent, seasonal and ultimately the outermost temporary zone. To identify the outer edge of the temporary wetland zone, a Dutch soil auger was used to extract sediment cores. The sediment samples were evaluated on-site for redoxymorphic soil features such as mottling, soil wetness and gleying.

The GPS coordinates of all soil sampling locations were captured and mapped using Geographic Information Systems (GIS) (QGIS 3.34) for further processing and analysis. Aerial photography, field notes and coordinates of the sampling sites were

then used in combination to identify and delineate the potential extent of wetlands/riparian areas.

Wetlands may comprise of one or more HGM units. In this study, an individual HGM unit was identified within the 500m buffer (refer to Section 5.1). The wetland area identified was classified according to the National Wetland Classification System developed by the South African National Biodiversity Institute (SANBI) (Ollis *et al*., 2013) and DWAF (2008). The HGM classification system uses the geomorphological and hydrological features of the delineated wetland unit to determine its classification. The features that are assessed relate to the way in which water behaves in the wetland system.

Table 3.1: Classification of plants according to occurrence in wetlands (DWAF, 2008)

TYPE	DESCRIPTION
Obligate Wetland Species	Almost always grow in wetlands (> 99% of occurrences)
Facultative Wetland Species	Usually grow in wetlands (67%-99% of occurrences) but occasionally are found in non-wetland areas
Facultative Species	Are equally likely to grow in wetlands and non-wetland areas (34%-66% of occurrences)
Facultative Dry-land Species	Usually grow in non-wetland areas but sometimes grow in wetlands (1%- 34% of occurrences)

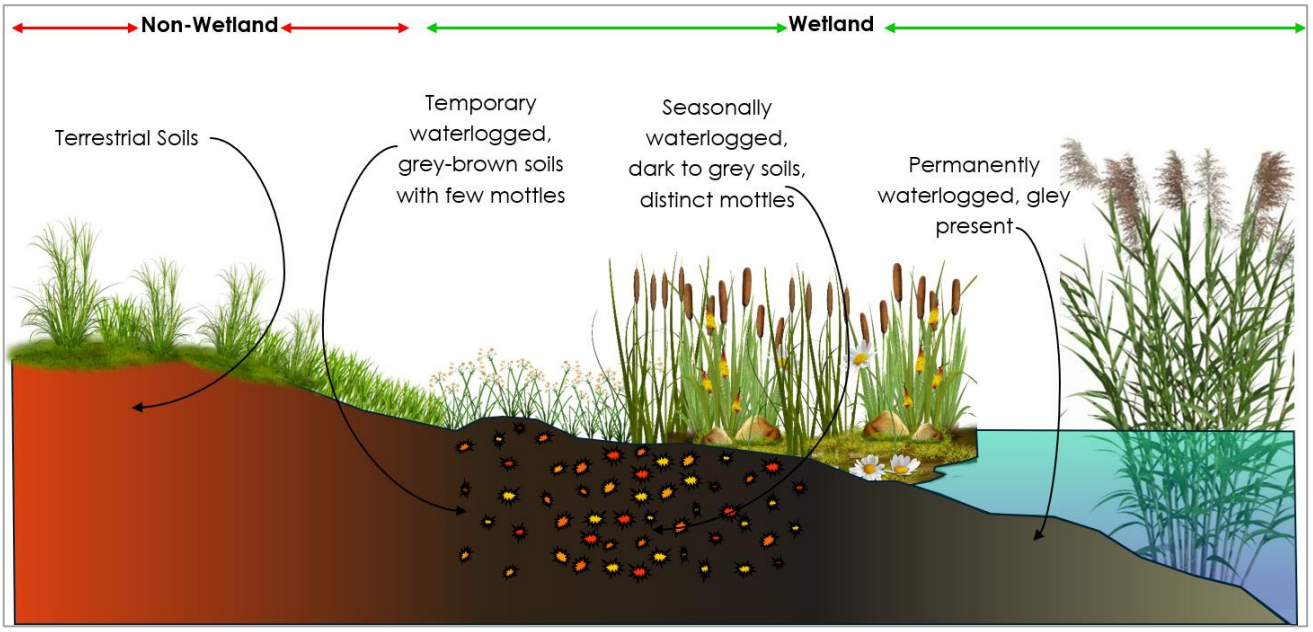


Figure 3.1: Cross sectional diagram of a wetland, indicating how the soil moisture and vegetation indicators change as one moves along a gradient of decreasing wetness, from the middle to the edge of the wetland (Author, 2024)

3.4 Riparian classification

River Riparian (RR) systems were divided in RR units based on topographic location, landform, hydrological characteristics and potential risk of degradation. The classification of river channels is based on their association of where they are located and identified along the entire network channel. In accordance with DWAF (2008), there are typically three broad channel types, namely: “A”, “B” and “C”. The main difference that exists between the categories are based on their relative position to the zone of saturation within the network channel.

Table 3.2: Indicating the three broad channel categories and their descriptions adapted from DWAF, 2008

CHANNEL CATEGORY	SHORT DESCRIPTION
A	They are often considered as ephemeral streams which only have presumable flows for approximately 3 months in a year typically due to rainfall events, and is not replenished or supplied by baseflow
B	These channel streams tend to have maintain their flow for longer durations (typically 6-9 months in a year) as some have been noted to be replenished by baseflow
C	They are the channels or streams that exhibit flow throughout the year (perennial) and has a constant supply to baseflow

This classification system was favoured as it is based on the amount of saturation within soils in the riparian zone; ranging from very seldom (A), to quite often (B), and to always saturated (C) (DWAF, 2008).

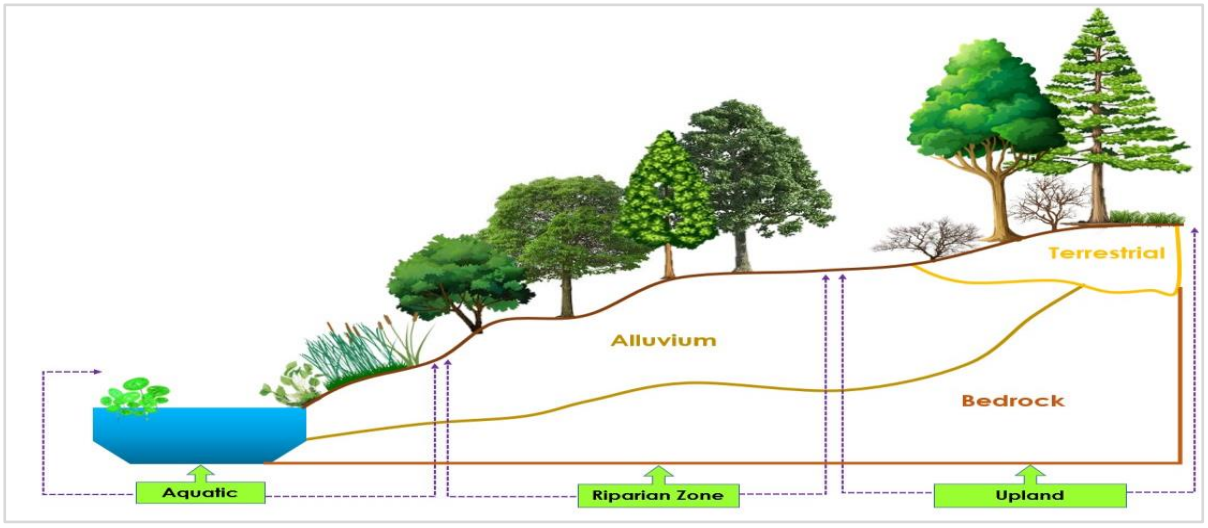


Figure 3.2: A schematic diagram indicating the different zonal positions from the aquatic zone located on the edge of a large riverbank, to the riparian zone located slightly further inland and lastly the terrestrial zone located upland regions.

3.5 Wetland screening

A risk assessment was conducted to determine if the delineated wetlands were likely to be affected by the proposed development and if likely to trigger aspects of a Section 21 WULA (c and i). Any wetlands that fell within the impact zone, therefore, and within the minor catchment of the proposed development site, and were potentially at risk, were to be screened further.

The first phase of the risk assessment was conducted at desktop level and verified in-field. This aided the determinations of which of the desktop delineated wetlands were likely to be affected by the proposed development. Wetlands found within the sphere of influence of the proposed activity and within the 500m buffer would have to undergo further risk quantification.

3.6 Risk Assessment

The assessment of the risk of all the proposed development's impacts, and associated consequences on the watercourses were performed by using an adapted version of the Risk Assessment developed by the DWS (2015): "*Aspects and impact register/risk assessment for watercourses including rivers, pans, wetlands, springs, drainage lines.*", alternatively known as the Risk Assessment Matrix or RAM.

A low risk category should be subjected to duty of care whereas a wetland that scores a moderate/high risk rating for any of the impacts should be subjected to a full wetland functional assessment. The tool used to determine the functionality of a wetland is described below. Table 3.3 illustrates the different risk ratings, their classes, and the management descriptions.

Table 3.3: Risk assessment categorization

RATING	CLASS	MANAGEMENT DESCRIPTION
1 – 55	(L) Low Risk	Impact to watercourses and resources quality small and easily mitigated
56 – 169	(M) Moderate Risk	Risk and impact on watercourses are notable and require mitigation measures
170 – 300	(H) High Risk	Watercourse(s) impacts by the activity are such that they impose a long-term threat on a large scale

3.7 Wetland Functional Assessment

The functional assessments conducted on all wetland components to assess the risk of being compromised as a consequence of developmental activity include the WET-Health Level 1 assessment, WET-EcoServices Level 2 assessment; and the Ecological Importance and Sensitivity (EIS) assessment.

3.7.1 WET-Health (Present Ecological State)

The WET-Health Level 1 assessment was undertaken to ascertain the Present Ecological State (PES) of the wetland environments affected by the proposed development (Macfarlane *et al*. 2009). The state of the three main functional aspects of the wetland is considered for the WET-Health index. These include: (1) hydrology, (2) geomorphology and (3) vegetation. Each of these functional aspects follows a broadly similar approach and is used to determine which anthropogenic impacts have affected the health status of the wetland. The overall score is integrated and expressed as a PES category. In addition, the trajectory of change of the wetland health is also assessed and is expressed as a change symbol.

Table 3.4: Present Ecological Status (PES) score categories for describing the integrity of wetlands

Impact Category	Health Category	Description	Range
None	A	Unmodified/natural	0 – 0.9
Small	B	Mostly Natural with a few modifications. A slight change in ecosystem processes is discernible and a small loss of natural habitats and biota may have taken place.	1 – 1.9
Moderate	C	Moderately modified. A moderate change in the ecosystem processes and the loss of natural habitats has taken place but the natural habitat remains predominantly intact	2 – 3.9
Large	D	Largely modified. A large change in ecosystem processes and loss of natural habitat and biota has occurred.	4 – 5.9
Serious	E	A very large change in ecosystem processes and loss of natural habitat and biota but some of the remaining natural habitat features are still recognizable.	6 – 7.9
Critical	F	The modification has reached a critical level and the ecosystem processes have been modified completely with an almost complete loss of natural habitat and biota	8 – 10

3.7.2 Wet-EcoServices (Ecological Goods and Services)

A WET-EcoServices Level 2 assessment evaluates the "ecological goods and services" provided by HGM units potentially affected by the proposed development. The tool provides information on the importance of wetlands in delivering different ecosystem services under a number of different categories (Kotze *et al.*, 2009). These categories are illustrated in Figure 3.3.

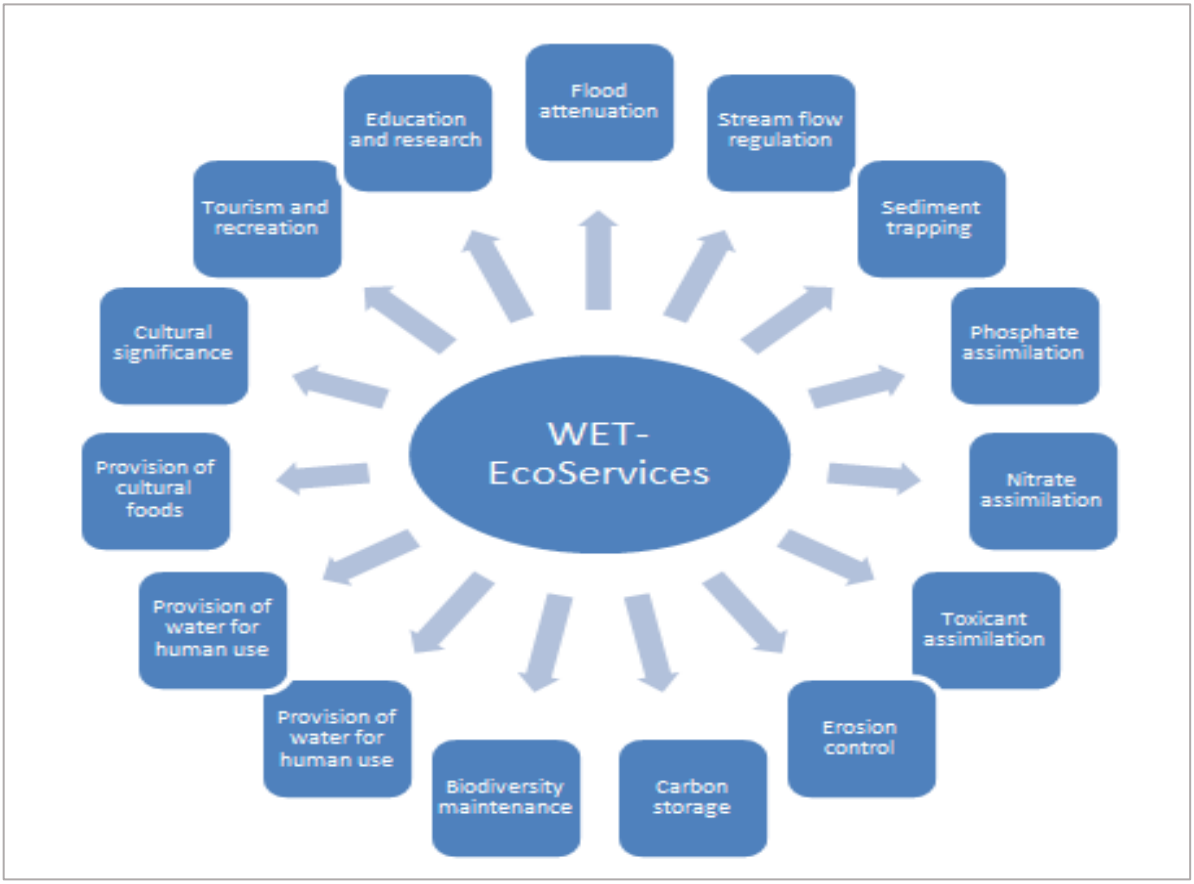


Figure 3.3: Wetland ecological goods and services assessed by the WET-EcoServices tool

An assessment was undertaken that examines and rates the following services according to their degree of importance and the degree to which the services are provided (Table 3.5).

Table 3.5: Classes for determining the likely extent to which a benefit is supplied

Score	Rating of likely extent to which a benefit is being supplied
<0.5	Low
0.6 – 1.2	Moderately Low
1.3 – 2.0	Intermediate
2.1 – 3.0	Moderately High
>3.0	High

3.7.3 Ecological importance and sensitivity (EIS)

The EIS scores were calculated using the *Resource Directed Measures for Protection of Water Resources* (Kleynhans, 1999) methods. This approach provides information on the ecological importance of the HGM unit or RR unit in terms of unique biodiversity and sensitivity, which refers to the system's ability to resist disturbance and its capability to recover from disturbance once it has occurred (resilience).

Table 3.6: Ecological importance and sensitivity categories.

EIS Category	Ecological Management Class[1]	Description	Range of Median
Very High	**A**	Ecologically important and sensitive on a national or even international level. The biodiversity of these systems is usually very sensitive to flow and habitat modifications. They play a major role in moderating the quantity and quality of water of major rivers.	>3 and <=4
High	**B**	Ecologically important and sensitive. The biodiversity of these systems may be sensitive to flow and habitat modifications. They play a role in moderating the quantity and quality of water of major rivers.	>2 and <=3
Moderate	**C**	Ecologically important and sensitive on a provincial or local scale. The biodiversity of these systems is not usually sensitive to flow and habitat modifications. They play a small role in moderating the quantity and quality of water of major rivers.	>1 and <=2
Low/marginal	**D**	Ecologically important and sensitive on a provincial or local scale. The biodiversity of these systems is not usually sensitive to flow and habitat modifications. They play a small role in moderating the quantity and quality of water of major rivers.	>0 and <=1

4. STUDY AREA

4.1 Project study area and description

The proposed Kambreek prospecting right area is approximately 1547Ha in size and compromises of portions 1, 2 and 3 of Kambreek 38 Farm. The study area is situated in the Khai-Mai Local Municipality, Namakwa District Municipality, and province of Northern Cape, South Africa. The central co-ordinates of the Kambreek prospect right site is given as 28°57'33.27"S; 18°59'10.57"E. Whilst the perimeter co-ordinates are:

PERIMETER CO-ORDINATES	
Point 1 (North-Western Corner)	28°56'21.06"S; 18°58'1.24"E
Point 2(North-Eastern Corner)	28°56'4.68"S; 18°59'29.26"E
Point 3	28°56'29.17"S; 18°59'43.51"E
Point 4	28°56'58.07"S; 19° 0'6.86"E
Point 5	28°58'4.43"S; 19° 0'6.15"E
Point 6 (South-Eastern Corner)	28°58'58.92"S; 19° 0'12.66"E
Point 7 (South-Western Corner)	28°59'15.75"S; 18°59'31.02"E
Point 8	28°58'31.06"S; 18°58'35.41"E
PROPOSED BOREHOLE CO-ORDINATES	
Borehole 1	28°56'40.99"S; 18°59'11.47"E
Borehole 2	28°57'35.46"S; 18°59'4.20"E
Borehole 3	28°56'57.05"S; 19° 0'13.75"E
Borehole 4	28°59'14.53"S; 18°58'16.36"E
Borehole 5	28°57'55.04"S; 18°58'34.90"E
Borehole 6	28°58'23.34"S; 18°59'23.64"E
Borehole 7	28°59'48.23"S; 18°58'58.62"E
Borehole 8	28°58'28.92"S; 18°58'47.39"E
Borehole 9	28°57'55.04"S; 18°59'52.40"E
Borehole 10	28°56'13.42"S; 18°58'44.18"E

The prospect study is undertaken to assess the viability of the landscape in terms of available minerals and natural resources. The surrounding landscape has remained fairly naturalistic with the exception of the farm roads, agricultural greenhouses, solar panels and Klein Pella guesthouse situated along the central regions of the site. The site contained a variety of wild animals including Chacma baboons, Southern Vervet monkeys, South African ground squirrels and Cape Klipspringer. The presence of the main Orange River is situated towards the northern regions.

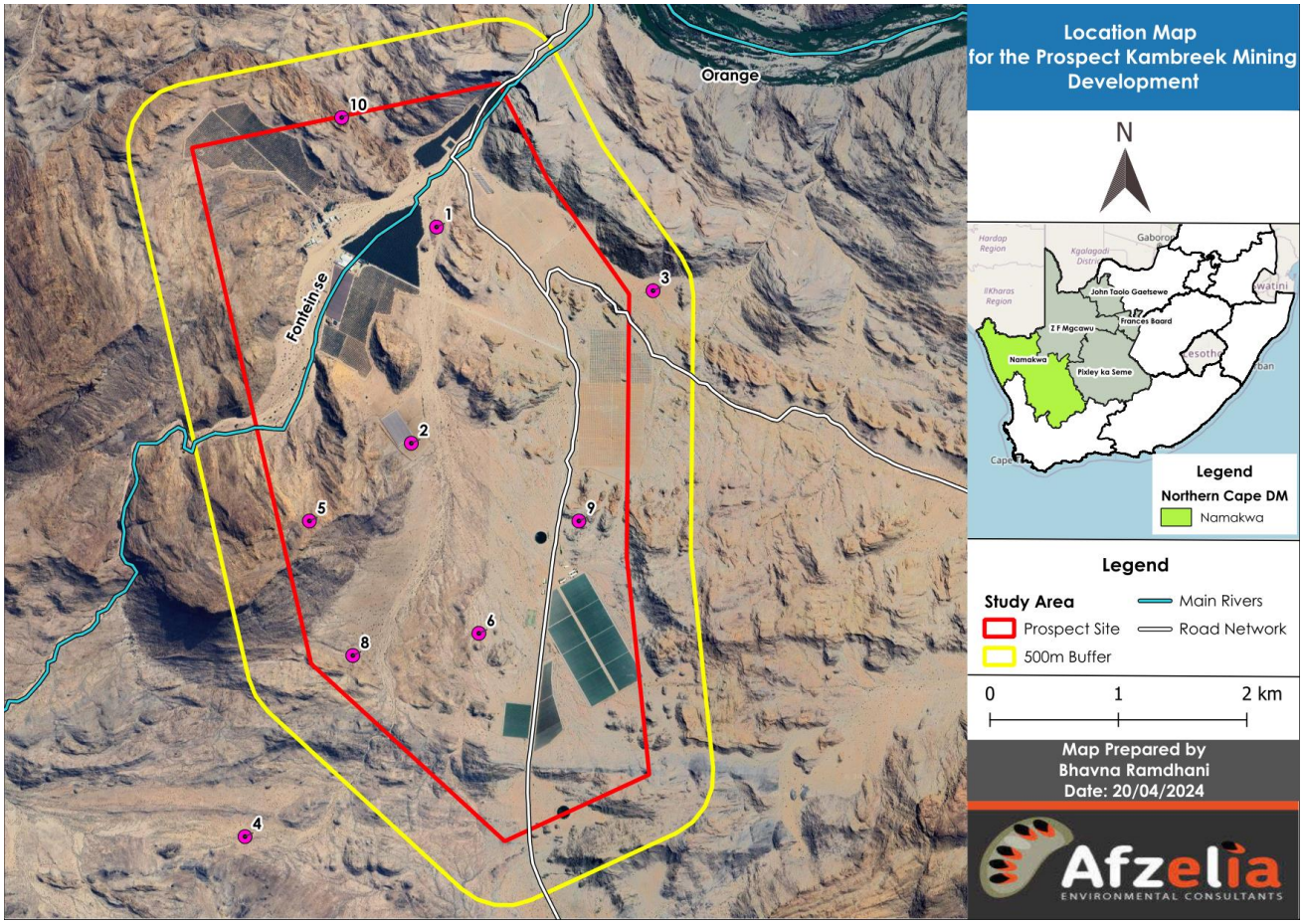


Figure 4.1: Location map of study area in relation to the Namakwa District Municipality and Northern Cape

4.2 Slope and topography

Slope and topography play an integral role in the origin and evolution of wetlands. The topography of the study area exhibits mountainous terrain along the southern and western extremities of the site. These topographical features act as a natural buffer by forming barriers to impacts which may occur (upstream/downstream). The site drains towards the north-eastern regions into the main Orange River. The smaller Fontein se tributary has incised the central portion of the study area. The tributary appeared to flow through the wetland regions in a small channel, however dried towards the west due to the Autumn season experiencing less rainfall. The landscape displayed the highest elevation towards the south and western regions, whilst the eastern and extreme north-western portion of the regulated 500m buffer zone has been influenced by the Fontein se Tributary resulting in relatively gentle topography and drainage.

The general elevation of the study area ranges from around 963m in the southern extent down to 281amsl towards the northern and eastern extremities of the regulated 500m buffer. The main Orange River is located just northeast of the prospect site and, all streams and drainage lines will eventually lead into this system. Whilst the main river systems are perennial, most of the non-perennial streams are typically fed by sub-surface groundwater contributions as the seasons change. However, these small streams readily run dry due to soil permeability and depth to water table.

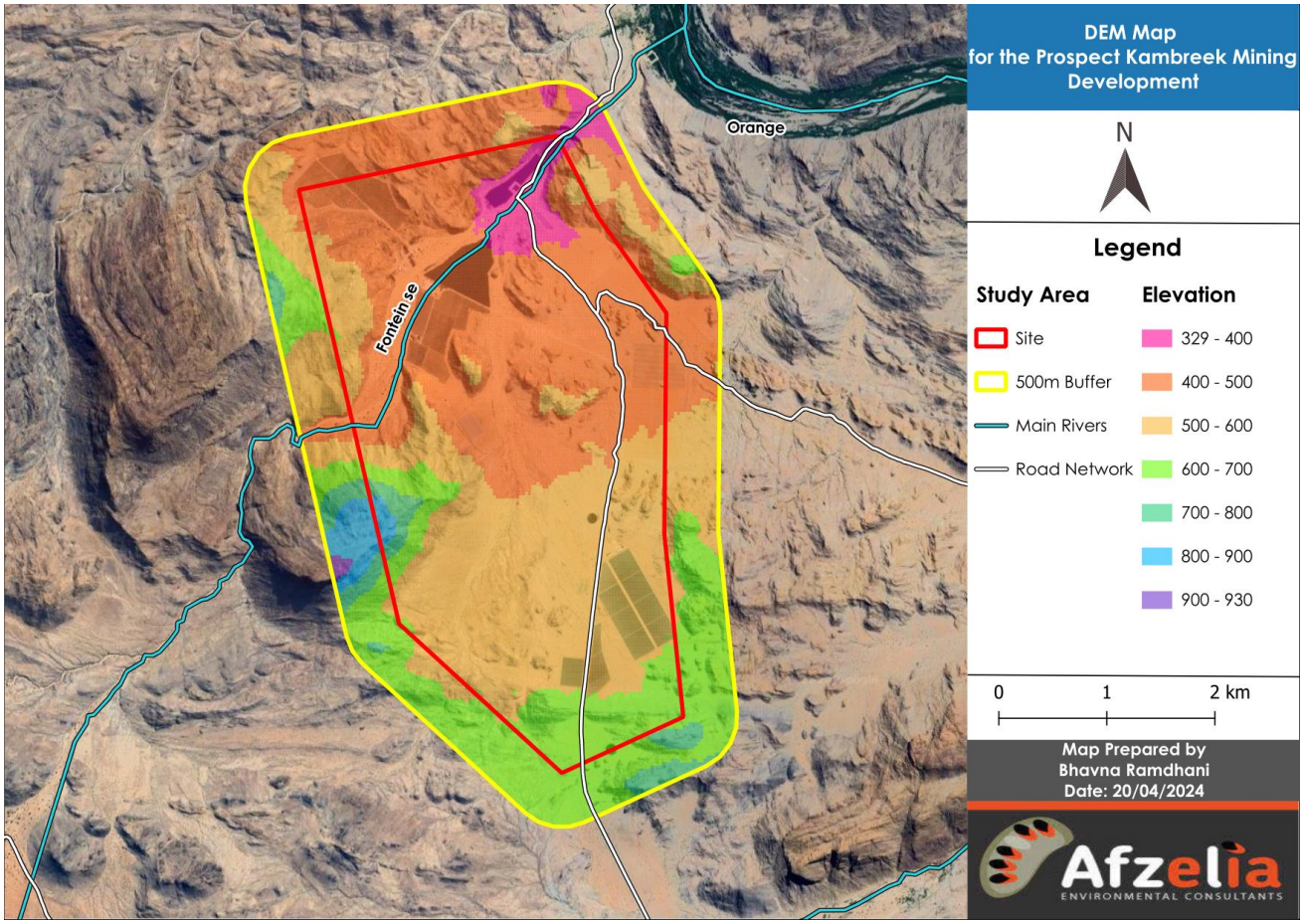


Figure 4.2: Digital Elevation Model (DEM) of study area

4.3 Climate

Climate generally describes *inter alia*, the temperature and moisture conditions of a particular area over a period of time. Climate plays a significant role in the formation of soil properties, for instance, soils that are found in warmer or moist climates are more developed as compared to soils found in cooler or drier climates. The proposed activity site lies within the summer rainfall region of South Africa. The Northern Cape Province of South Africa is the largest province that cover around 372 889 km^2 land area. Rainfall is variable with the annual rainfall ranging from 450 mm in the northeast down to less than 80 mm in the northwest. The Namakwa District is already extremely water scarce, with large areas in the north regularly receiving less than 100mm of rainfall annually.

In January, average afternoon temperatures range between 34°C and 40°C in the interior. Winter temperatures range between 5°C and 15°C. Frost occurs in the high-laying regions with snow occasionally falling in the Sutherland and Kamiesberg uplands region. The fog that blankets much of Namaqualand is a phenomenon that occurs frequently during the autumn months when onshore wind speeds are not strong enough to produce the turbulence that breaks up the fog. The fog is an important alternative source of moisture for the plants and various animal species and fulfils a vitally important function in the ecology of the Richtersveld.

4.4 Soils

4.4.1 Terrestrial Soils

The terrestrial soils around the proposed study area are mainly derived from the weathering of underlying sedimentary rock strata. The topography of the area allows for the gentle slopes to contain some colluvial sediment to be carried along and deposited from gradual erosion processes. The commonly occurring A-horizon encountered in the site is a layer that had evolved from Quaternary sediment deposits that overly the underlying sedimentary lithologies. These sedimentary sequences have evolved, through pedological processes, into a distinct surface soil horizon that are texturally dominated by fine to medium grained sediment mixed with a low amount of organic matter content and low amounts of clay. The A-Horizon has a thickness which varies in these soils from about 30cm to a maximum of over half a meter.

4.4.2 Wetland Soils

The main difference of wetland soils from terrestrial soils, is that they are typically anaerobic. This absence of oxygen produces distinct characteristic differences in soil colour and texture. When soils are flooded, oxidized Fe^{3+} (ferric) is reduced to Fe^{2+} (ferrous) chemically and by microbes to support respiration, and result in soil changes from the basic yellow, orange, or red to a recognizable grey colour (Refer to Figure 4.3 below) (Vepraskas, 1994). Mineral soils that are continuously inundated or saturated may display uniform grey colour, also known as gley. Sometimes, soil takes on hues of green or blue that indicates complete reduction of Fe^{3+} in the soil matrix. In wetlands that dry down periodically, reduced Fe can re-oxidize and the soil may take on a mottled colour, with areas of red (oxidized Fe) and grey (reduced Fe) (Craft, 2015).

Figure 4.3: The typical formation of a redoximorphic feature within the soil profile (adapted from Jackson et al, 2014)

4.5 SANBI Vegetation

The National Vegetation Map Project (VEGMAP) delineates, classifies, maps and samples the vegetation of South Africa, Lesotho and Swaziland which was produced and revised throughout the years by Mucina and Rutherford (2006/2012). The purpose of creating this project was to map the extent of various vegetation types across the country, which would aid in establishing their individual conservation status. Therefore, these refined datasets were subsequently used to determine the natural state of the proposed study area. Thus, a comparison could thereafter be conducted between the present state

and recorded natural state of the vegetation units, which would provide insight on the range of impacts induced on the vegetation cover. Note that these classifications are done on a broad scale and at a desktop level.

The VEGMAP indicates that the site is evenly distributed between the Eastern Gariep Rocky Desert and Eastern Gariep Plains Desert.

Eastern Gariep Rocky Desert is described as a landscape of hills and mountains (up to 650 m), mostly with bare rocky outcrops and covered with very sparse shrubby vegetation in crevices. Habitats are mainly controlled by topography, aspect, local climate and lithology. On the summits and higher northern slopes there is much higher preponderance of succulent plants including *Euphorbia avasmontana, Aloe dichotoma, A. microstigma* subsp. *microstigma, Pelargonium aridum* and *Kleinia longiflora*. Succulent plants are also important on the northern foothills and also include *Aloe dichotoma, Euphorbia avasmontana, Sarcostemma viminale* and the diminutive *Lapidaria margaretae* (Mucina & Rutherford, 2006).

Eastern Gariep Plains Desert is described as a landscape of often sloping plains, sharply contrasting with the surrounding rocky hills and mountains. Typical was vegetation in the breaks between the mountains to the Orange River. Grassland dominated by "white grasses", some spinescent (*Stipagrostis* species), on much of the flats with additional shrubs and herbs in the drainage lines or on more gravelly or loamy soil next to the mountains (Mucina & Rutherford, 2006).

4.6 SANBI Ecoregions

The proposed study area falls entirely within the Orange River Gorge Ecoregion (Kleynhans *et al*., 2005). Ecoregions are used to categorise the regional setting for national and regional water resource management applications. The ecosystem approach identifies main attributes which include physiography, climate, rainfall, geology and potential natural vegetation (Kleynhans *et al*., 2005). Note* these classifications are done on a broad scale and at a desktop level.

This region can predominantly be broken down into the following characteristics:

- Mean annual precipitation: Arid.
- Coefficient of variation of annual precipitation: Very high.
- Drainage density: Medium.
- Stream frequency: Medium high.
- Slopes <5%: <20%.
- Median annual simulated runoff: Very low.
- Mean annual temperature: High.

Table 4.2: Main attributes of the Orange River Gorge (Kleynhans et al., 2005)

Main Attributes	Short Description
Terrain Morphology: Broad division (Primary) (dominant types in bold)	Plains Low Relief (limited); **Closed Hills; Mountains; Moderate and High Relief**
Vegetation types (Secondary) (dominant types in bold)	Upland Succulent Karoo; **Orange River Nama Karoo**
Altitude (above mean sea level – a.m.s.l)	0 – 1100
MAP (mm)	0 to 100
Coefficient of Variation (% of annual precipitation)	35 – 40
Rainfall concentration index	30 to >65
Rainfall seasonality	Very late summer to winter

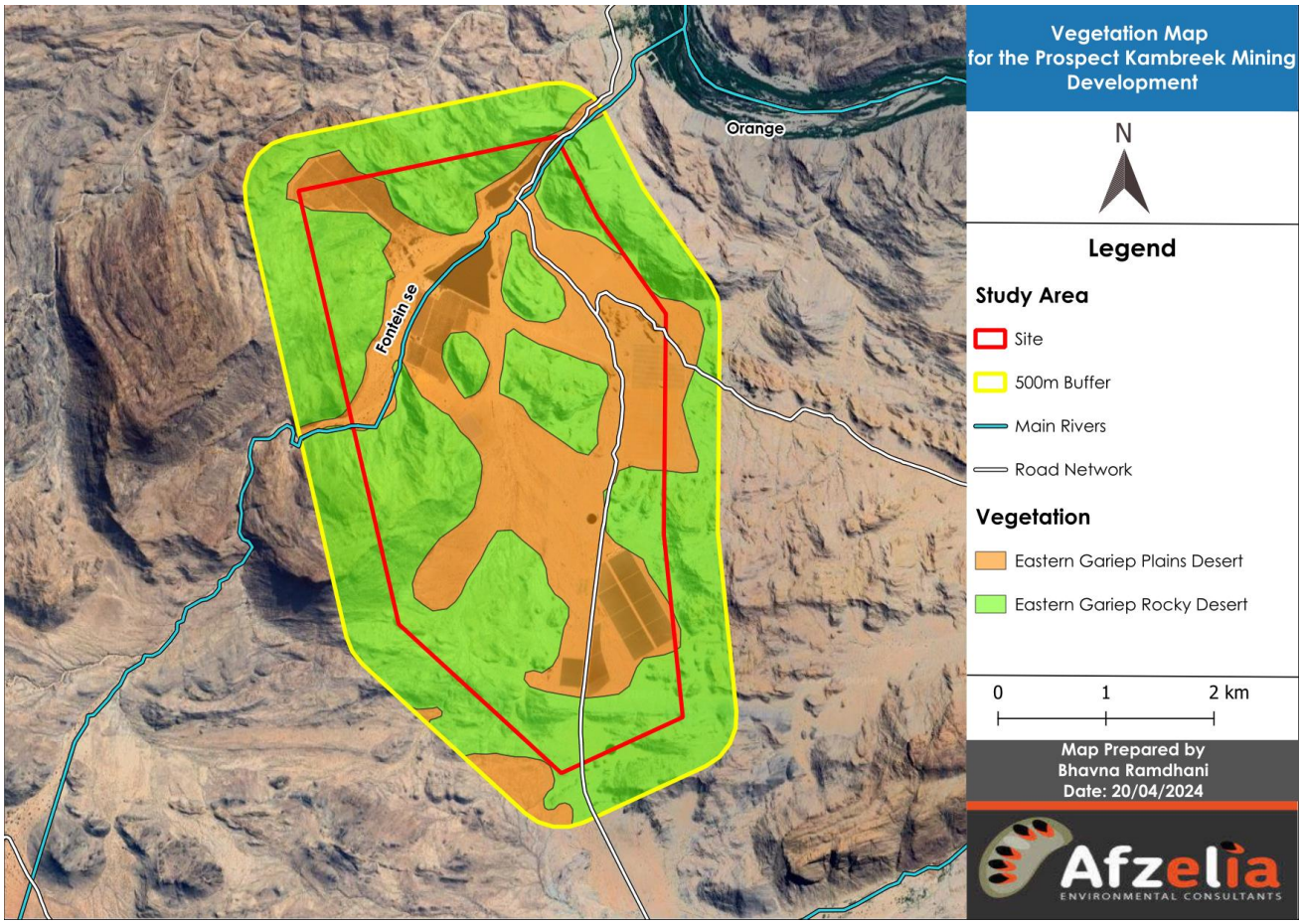


Figure 4.3: Vegetation for the proposed study area

4.7 Critical Biodiversity Areas

In order to support sustainable development through sustainable land use management the Critical Biodiversity Areas (CBAs) have been developed. The purpose of the CBA is to mainstream biodiversity into land-use planning and decision making by identifying critical areas for biodiversity conservation in the region. The overall aim is to promote the sustainable utilisation of natural resources by avoiding the loss or degradation of natural habitat in CBAs and promoting sustainable development and natural resource utilisation throughout the landscape, particularly in natural areas. The guidelines of the Northern Cape (2016) for each CBA and ESA category are outlined in table 4.3

Table 4.3: CBA Descriptions

CBA	DESCRIPTION
Critical Biodiversity Area: 1	Areas considered critical for meeting biodiversity targets and thresholds, and which are required to ensure the persistence of viable populations of species and the functionality of ecosystems.
Critical Biodiversity Area: 2	CBA 2 areas are areas of high biodiversity with a high level of irreplaceability, but there is flexibility in the landscape to achieve biodiversity targets contained in these areas. These areas must remain in good ecological condition in order to meet biodiversity targets.
Ecological Support Areas	Areas that support key biodiversity resources (e.g. water) or ecological processes (e.g. movement corridors) in the landscape. Functional but not necessarily entirely natural terrestrial or aquatic areas that are required to ensure the persistence and maintenance of biodiversity patterns and ecological processes within the Critical Biodiversity Areas. The area also contributes significantly to the maintenance of Ecosystem Services.
Protected Area	These are areas that are formally protected in terms of NEMPAA. Typically a specifically delineated area that is both designated and managed to achieve the conservation of the indigenous state and the maintenance of associated ecosystem services and cultural values, through legal or other effective means.

The CBA associated with the proposed activity is CBA 2 and Ecological Support Area (ESA) (Figure 4.5). This means that the Kambreek prospect right site occurs in areas considered of high biodiversity with a high level of irreplaceability, but there is flexibility in the landscape to achieve biodiversity targets.

It must be noted the aforementioned CBA type was identified at a desktop statistical level. The aquatic CBA is justifiable for the main Orange River exists along the northern reaches. The terrestrial CBA is similarly accepted since the area delineated towards the northern extremities have remained naturalistic due to mountainous terrain (Figure 4.6). The ESA have been delineated to encompass the Klein Pella Farm along the central regions, however, excludes the artificial plantations. The Klein Pella Farm has transformed the natural landscape with the associated infrastructure such as road networks, plantations, offices, and a guest house. The wetland systems were located on site and therefore recognised as a sensitive and important ecosystem.

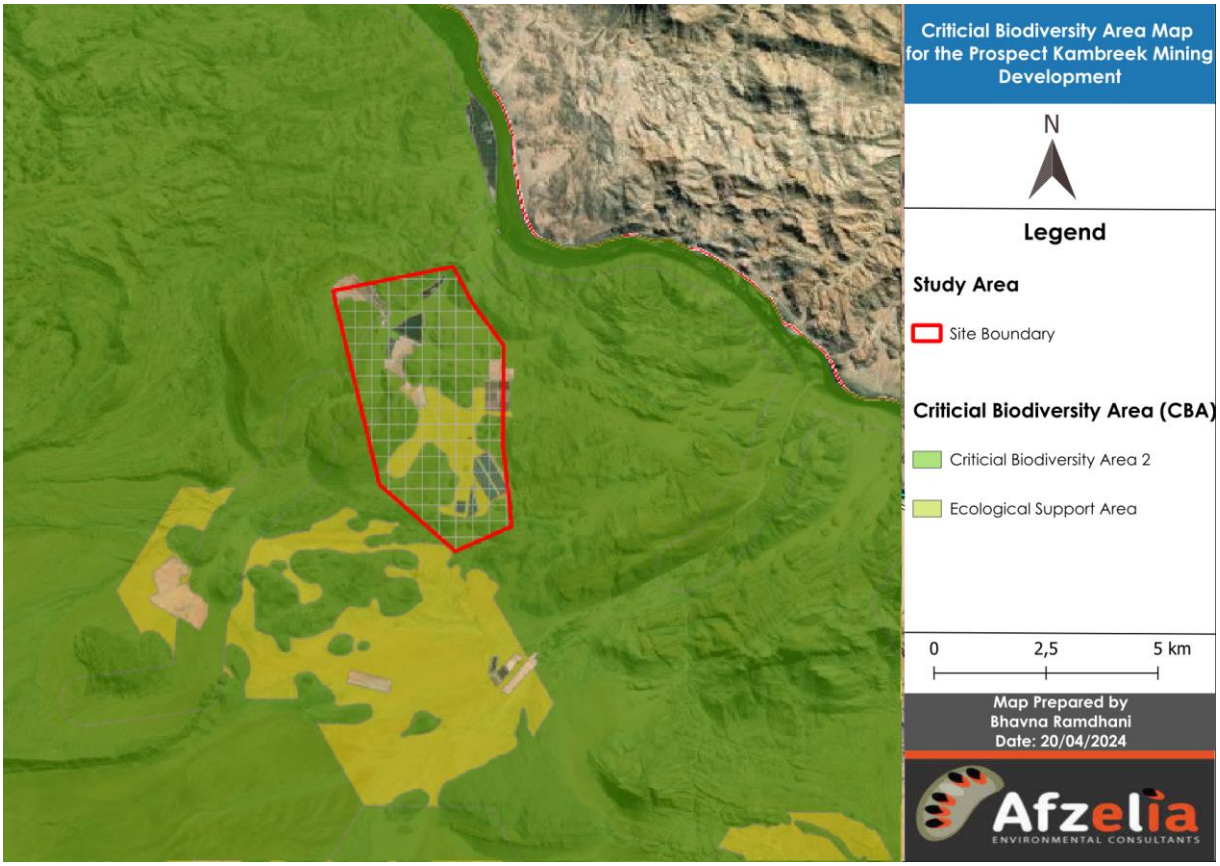


Figure 4.5: Terrestrial Critical Biodiversity Areas (CBA) for the proposed development

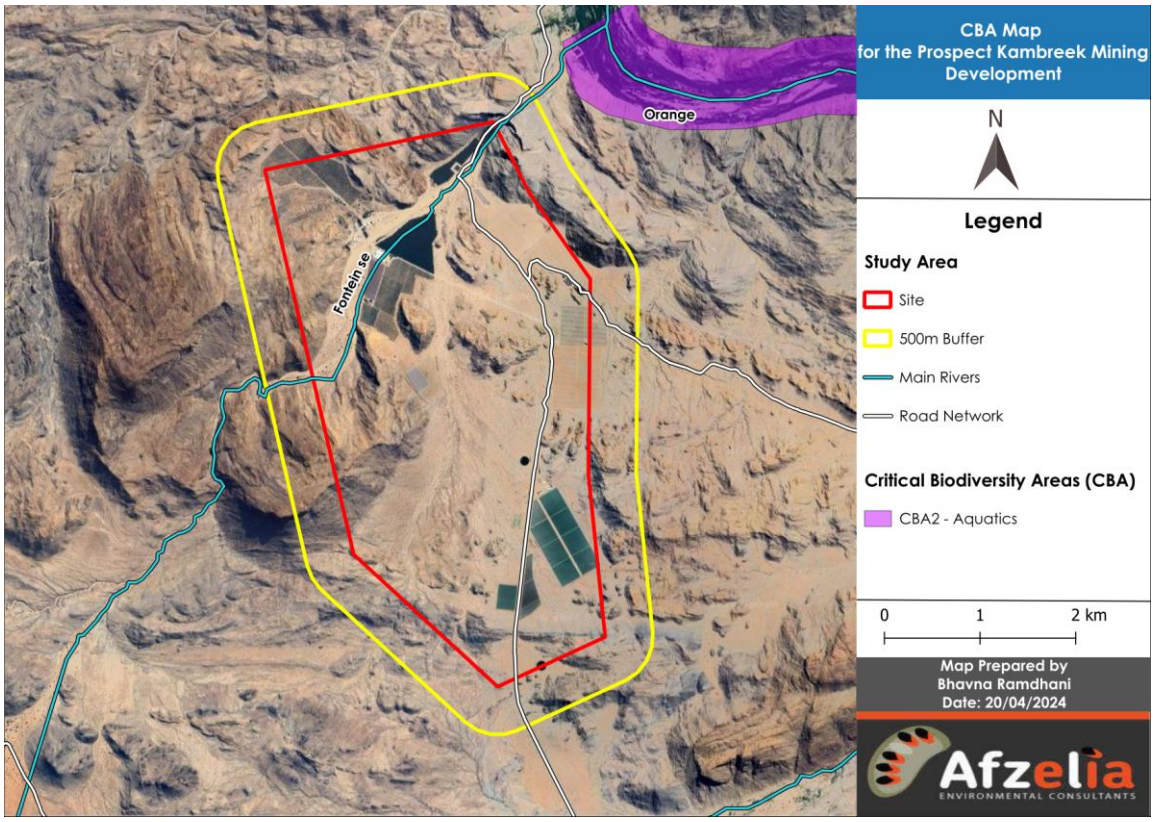


Figure 4.6: Aquatic Critical Biodiversity Areas (CBA) for the proposed study area

4.8 National Wetland Map 5 (SANBI)

The National Wetland Map 5 provides strategic spatial priority areas for conserving freshwater ecosystems and supporting sustainable use of water resources in South Africa (Nel *et al*., 2011). The project strives to conserve a sample of freshwater ecosystems and diversity of species as well as the ecosystem processes which generate and maintain diversity.

According to Figure 4.7 the main Orange River has been classified as a massive Channel Valley Bottom (CVB) wetland whilst a small portion of the Fontein Tributary has been classified as a river system. The field survey confirmed that the Orange River does have small islands of wetland that exist within the channel, however, does not have wetland features on its floodplain or banks (Figure 4.8). The Fontein system towards the south had already dried out as a consequence of the seasonal fluctuation (Figure 4.9).

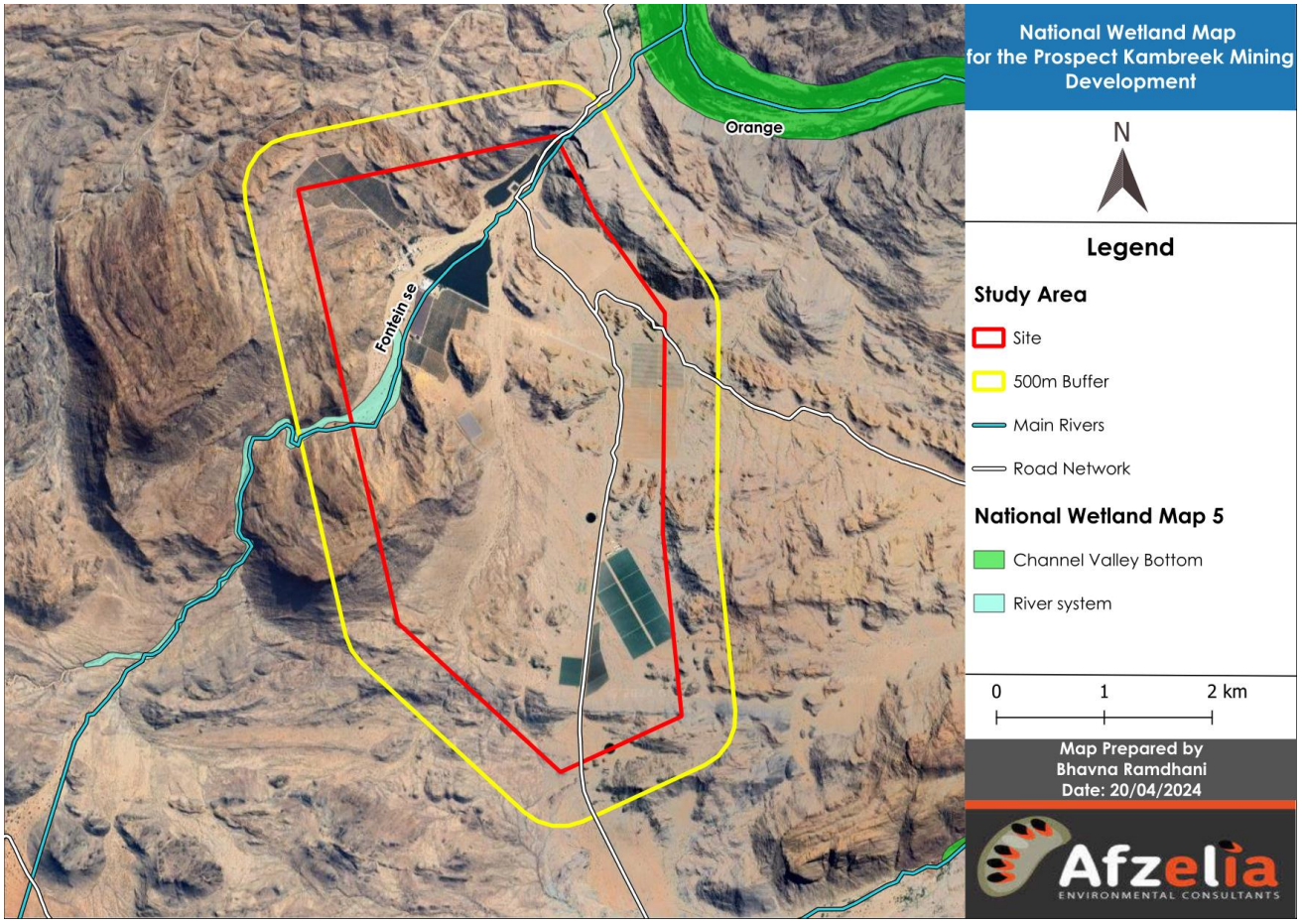


Figure 4.7: National Wetland Map in relation to the proposed study area

Figure 4.8: The Orange River with no wetland features along the embankments

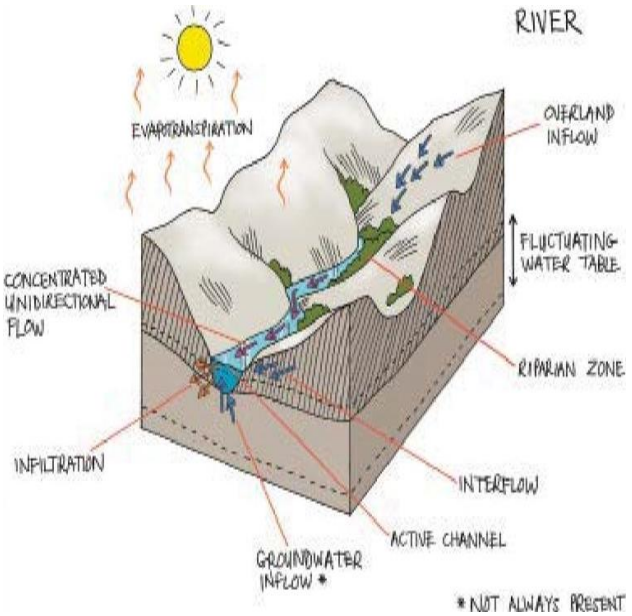
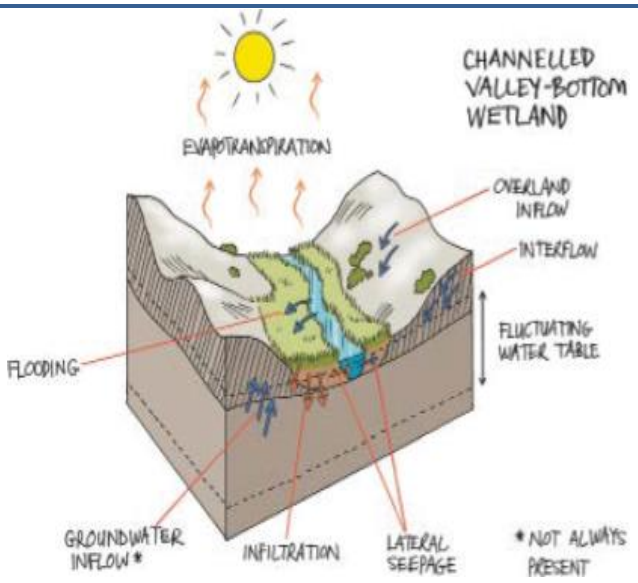
Figure 4.9: The Fontein se trickles over the rock face at the western edge of the 500m buffer area

5. WETLAND DELINEATION AND SCREENING

5.1 Desktop Investigations

The desktop evaluation of wetlands within the proposed development footprint and surrounding areas revealed the presence of an individual HGM unit, which was identified and delineated. For further understanding of the description of the HGM units as well as riparian environments occurring within the project area, DWAF (2008) and Ollis *et al.,* (2013) created a generic description which is shown below:

Table 5.1: HMG units present at the proposed development site and surrounding 500m buffer (DWAF, 2008; Ollis *et al.*, 2013)

Classification	Illustration	Description
River		A river system defined as the concentrated, unidirectional flow within a distinct active channel, either permanently or periodically. Dominant water sources for rivers include concentrated surface flow from upstream channels and tributaries. Other inputs can include diffuse surface or subsurface flow, interflow, and/or groundwater inflow. The riparian zone is the portion of land directly adjacent to the active channel (i.e. on the banks of the river), which is influenced by river-induced or river-related processes.
Channelled Valley Bottom		Channelled valley-bottom wetlands must be considered as wetland ecosystems that are distinct from, but sometimes associated with, the adjacent river channel itself, which must be classified as a 'river'. These valley-bottom wetlands are characterised by their location on valley floors, the absence of characteristic floodplain features and the presence of a river channel flowing through the wetland.

5.2 Hydrogeomorphic unit/River riparian

A summary table of the wetlands HGM systems together with their characteristics is provided below (Table 5.2)

Table 5.2: Summary of Wetland characteristics

HGM UNIT	WETLAND TYPE	EXTENT (Ha)
HGM 1	CVB	2.86

HGM – Hydrogeomorphic, CVB – Channeled Valley Bottom

Field Survey Sample Collection:

A comprehensive field survey was undertaken by the Afzelia team on the 9th and 10th of March 2024, to accurately delineate the wetland boundaries within the proposed development site and surrounding areas. It should be noted that areas that were inaccessible were mapped from a desktop perspective and are listed as potential wetland areas. Obligatory wetland plant species were found on site.

Terrestrial soils display a wide variety of characteristics dependent on the extent to which the soil forming factors have influenced their development. The texture of these soils ranges from very sandy to sandy-loam, as approaching the river riparian area. These soils also have relatively low organic matter and low clay content, lacking distinct structure.

Wetland soils are characteristically anaerobic, the lack of oxygen produces a distinct difference in the texture, colour and overall appearance of the soil. The samples that were collected displayed waterlogged soils, as the available iron has been reduced, producing the recognisable grey colour. These soils have a predominant clay texture and a high amount of organic matter present.

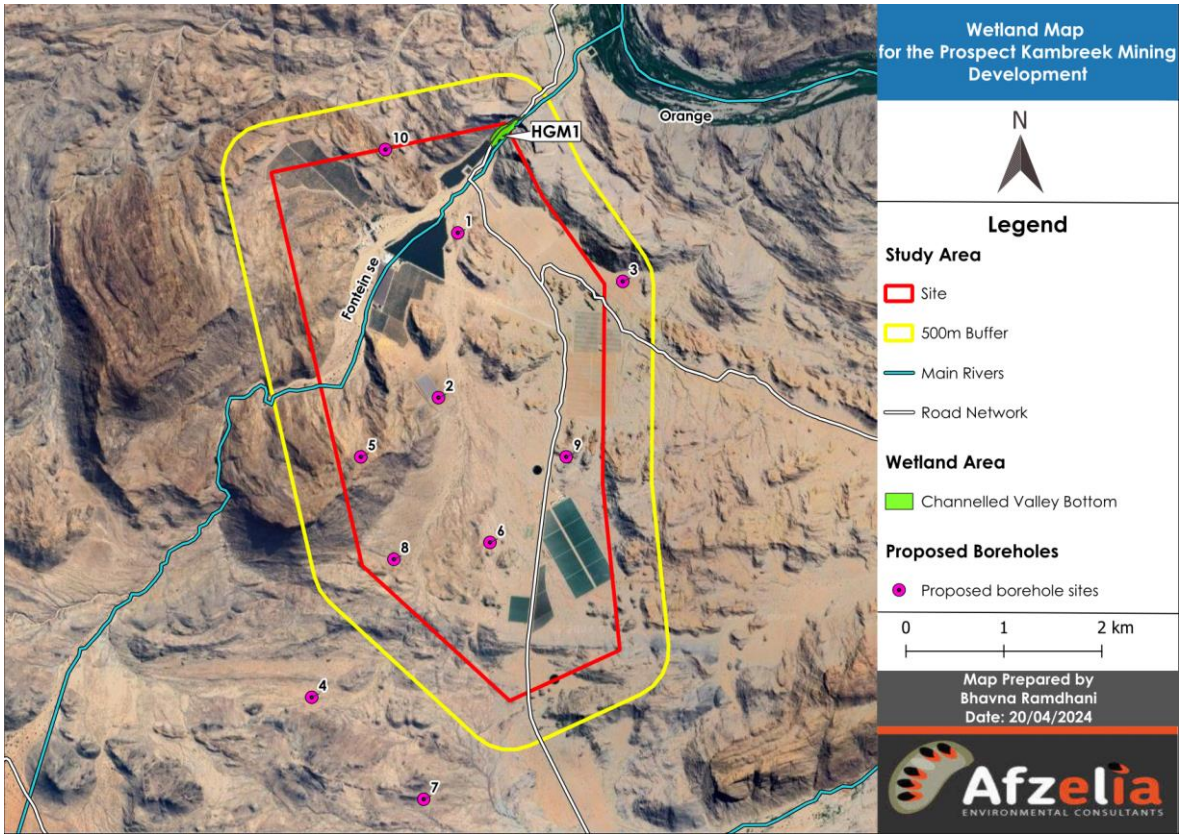


Figure 5.1: Composite wetland map indicating the position of the HGM units in relation to the proposed boreholes

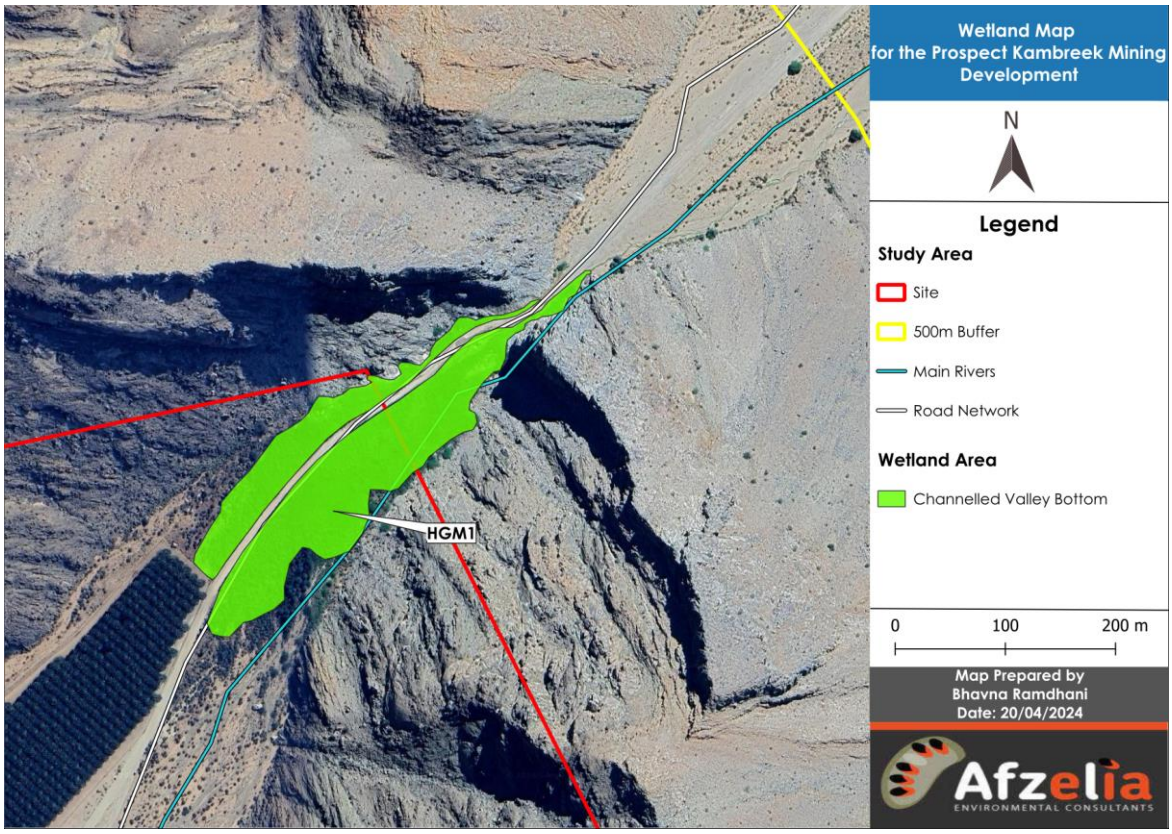


Figure 5.2: Close up HGM1

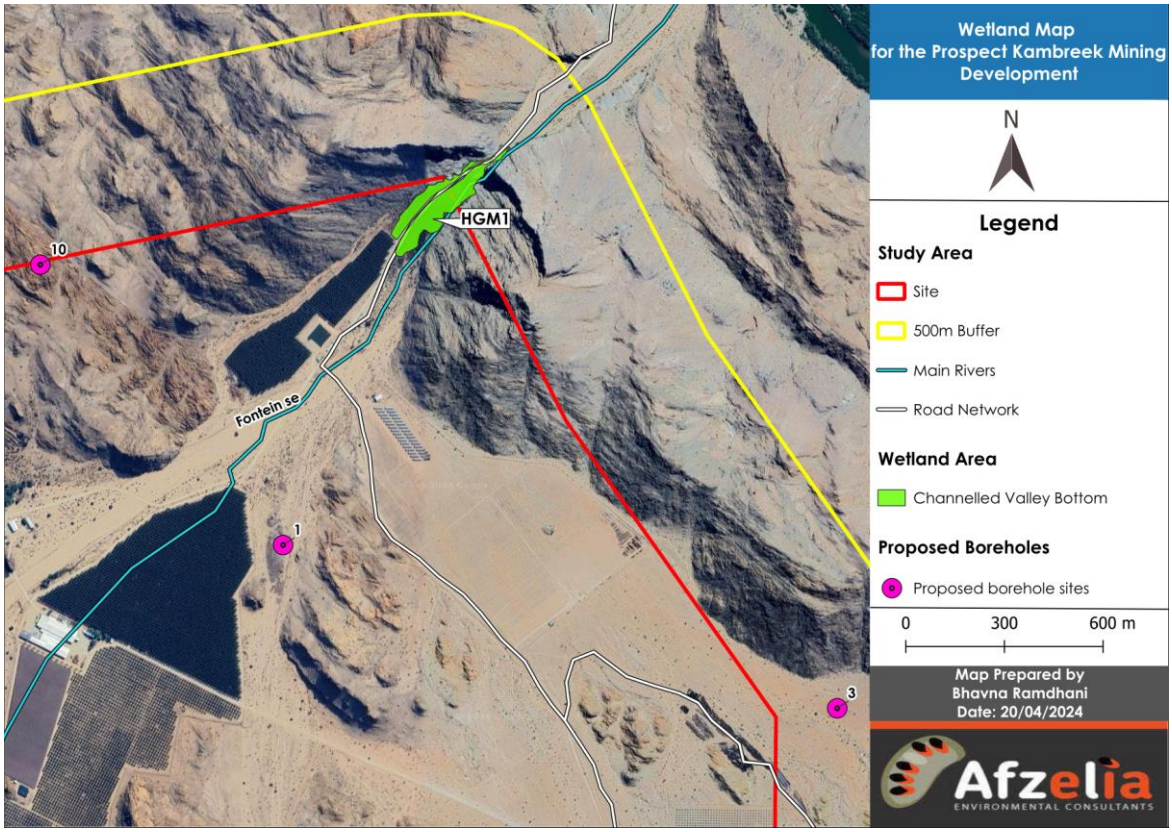


Figure 5.3: Location of HGM1 in relation to closest boreholes

Wetland system: HGM1

This wetland system has a small portion that is situated within the proposed study area along the north-eastern extremities, in close proximity to the date plantation. HGM1 is an elongated Channel Valley Bottom wetland that was historically one system. However, as a consequence of the road development, the system has been split into two units, each with a distinct channel draining towards the northeast into the Fontein se Tributary. The wetland is orientated in a south-westerly to north-easterly direction (Figure 5.2). The dominant vegetation for HGM1 is dominated by *Phragmites australis* (Figure 5.4A) which grades into *Cyperus marginatus* (Figure 5.4B). The wetland supports the ideal nesting habitat for the *Euplectes orix* (Southern Red Bishop). Auger sample indicated dense grey clay with some alluvium matter at depth (Figure 5.4C) before intercepting rocks. The field survey revealed that the wetland was subject to on-site impacts that include regular grass cutting to avoid overgrowth onto the road (Figure 5.4D). It should be noted that the shape and extent of the wetland will be subject to change depending on available groundwater supply present and during heavy rainfall seasons which will contribute towards the antecedent moisture conditions.

The closest boreholes to the wetland include Borehole 1, Borehole 10 and Borehole 3, which are situated at a distance of 930m, 1078m and 1899m respectively (Figure 5.3). The boreholes will not exceed an area of $1m^2$ each and is considered as an exploratory method to determine if the surrounding landscape is viable/ rich in mineral resources. Therefore, the risks associated from the boreholes will not have detrimental impacts to the downstream wetland features.

N.B* This wetland is excluded from all WET-HEALTH Assessments (PES, Ecoservices and EIS) as the system is deemed not at risk to the Kambreek prospect right application and associated proposed borehole drilling. The wetland is situated greater than 900m away from the closest proposed borehole site and hence will not be impacted by the onsite activities.

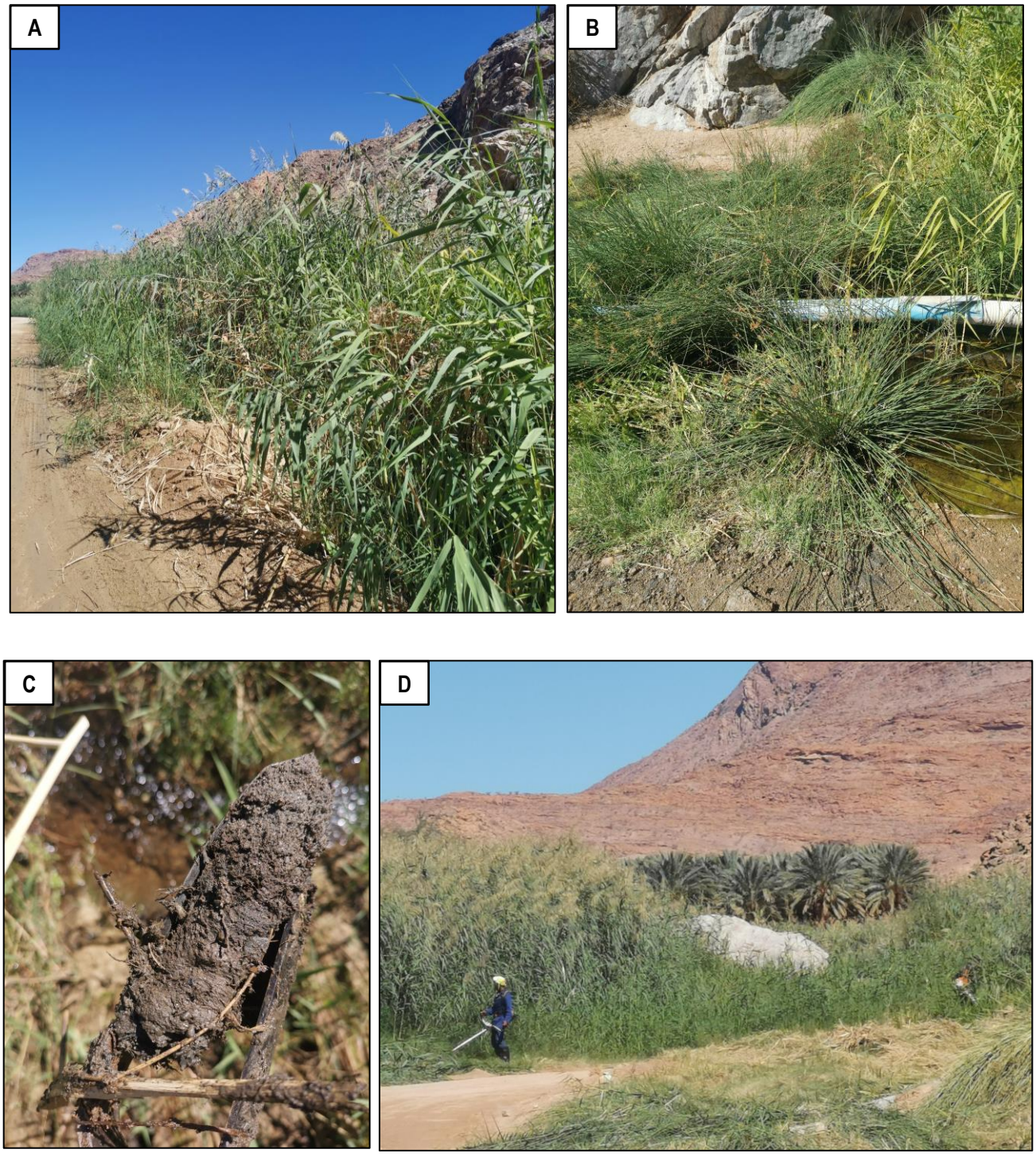


Figure 5.4: Dominant Phragmites australis (A), secondary vegetation of *Cyperus marginatus* (B) The auger sample indicating saturated clays at limited depths (C) Impacts from grass cutting activities (D)

5.3 Screening of 'at risk' wetlands/river riparian environments

The general guidelines used to identify the risk status of the watercourses are shown in Table 5.3 below:

Table 5.3: The general guideline utilized to identify the risk status of watercourses

RISK RATING	CRITERIA/DESCRIPTION
High	The watercourse/wetland is situated directly within or in close proximity to, or within the same minor catchment area as, the development footprint boundary. Therefore, the aquatic habitat, biota present within, water quality of and/or the hydrological regime through the watercourse/wetland are likely to be impacted on by the proposed development.
Moderate	The watercourse/wetland is situated directly upstream, or within a medium distance (32m to 54m) downstream of the proposed development within the same minor catchment area. This may result in the aquatic habitat, biota present within, water quality of and/or the hydrological regime through the watercourse/wetland being indirectly impacted on by aspects pertaining to the proposed development (e.g. sedimentation, pollution and/or a change in the hydrological characteristics of the system).
Low / No Impact	The watercourse/wetland is situated a significant distance (>54m) upstream or downstream of the proposed development, or within a landscape that prevents any direct/indirect impacts that have been determined to originate from the activity from reaching it, and thus is not likely to be impacted on by the proposed development.
	The watercourse/wetland is situated within a completely different minor catchment area to the proposed development, and thus is highly unlikely to be affected by direct or indirect impacts that have been determined to originate from the proposed development.

The location and extent of the watercourses were confirmed and assessed during the field survey and, subsequent screening provided an indication of the potential impacts accruing from the proposed activity. There are several factors known to have an influence on the level a watercourse will be impacted upon such as:

- ✓ The type of wetland / river system;
- ✓ The position of the system in relation to the any anthropogenic activity and,
- ✓ The position in which the system is located in relation to surrounding landscape.

Table 5.3 above presents the criteria which were used to rank the various watercourses in terms of risk. It must be noted that the criteria provided in Table 5.3 is utilised as a general guideline to identify the 'at risk' watercourses and is not indefinite in terms of the risk status of watercourses.

Table 5.4 presents the risk screening for the watercourses delineated within the surrounding development area and their respective risk status.

Table 5.4: The watercourses delineated within the surrounding the Kambreek prospect right footprint and their respective risk status

Unit	System Type	At risk	Impact Status	Rationale	After Mitigation
HGM1	Channelled Valley Bottom	No	**No/Low Impact**	HGM1 is situated approximately > 900m from the proposed borehole sites and therefore will not be impacted upon by the associated activities due to their location in terms of distance and relative position. The proposed borehole drilling will not exceed an area of 1m^2 per site and potential impacts that may arise will not be detrimental to the downstream wetland habitats.	**No/Low Impact**

5.3.1 Overall Impacts

All forms of development impact on the natural environment to some extent, however society needs to find a balance in advancing through urbanisation, whilst also maintaining habitat integrity. The field survey revealed that the landscape within the Kambreek prospect right site has remained relatively naturalistic towards the northern extremities. The areas within the central regions of the site have been historically transformed by the Klein Pella Farm, including plantations, offices, road networks and a guest house. Since the proposed borehole sites are situated >900m away from the downstream wetland, the overall contribution of the Kambreek prospect right application project will be considered low impact.

6. RECOMMENDATION & MITIGATION

The purpose of this section of the report was to identify and assess potential impacts to the Wetland systems and Riparian Area, as well as providing mitigation measures to limit the perceived impacts on the natural environment.

6.1 General recommendations and mitigation measures to be instituted.

Due the presence of the wetland systems around the proposed study area, the following general mitigation measures should be applied for any future proposed development:

Access control

- ✓ Schedule development activity in the dry season to prevent increased surface runoff, erosion and sedimentation as well as to avoid disturbance to resources during critical periods i.e. periods of courtship, breeding, nesting etc.
- ✓ As part of the induction process, all development activity staff should be educated about the importance and sensitivity of environmental areas (such as NFEPA wetlands) near or within the development activity site. Frequent inspection of the site must be done to ensure that the integrity of sensitive areas is maintained at all times.
- ✓ The development activity zone should be fenced off and clearly demarcated to prevent unauthorised access to sensitive areas.

Vegetation

- ✓ All invasive alien plant species should be removed and disposed of appropriately prior to development activities. Such development activity site should be inspected regularly during development activity to identify and remove emerging invasive alien plants (IAP) species.
- ✓ The removal of alien vegetation should be undertaken manually by hand near sensitive areas. The use of heavy machinery should be kept to minimum near sensitive environments.
- ✓ Fauna found within the development activity zone should be moved to the closest natural or semi-natural habitat zone away from the development activity site.

Erosion and sedimentation control

- ✓ Sandbags should be utilized as a temporary diverting barrier downslope of excavation areas. The sandbags should be placed in order to minimize surface runoff ensuring the sensitive areas situated downslope does not incur any impacts as a result of sedimentation and erosion. Sandbags used to temporarily divert water should always be in good condition and inspected regularly.
- ✓ Soil excavated during development activity should not be piled onto from top to bottom within a stipulated area away from any sensitive environment. The soil should be kept in stock piles and must be situated upslope or conveniently placed to prevent sedimentation of the sensitive environments.
- ✓ Soil stockpiles must be protected from erosion, surrounded by suitable earthen buns and covered by erosion control blanket to prevent the transfer of sediment into sensitive areas.
- ✓ Site engineers should regularly inspect the erosion control measures to confirm their appropriateness and integrity.

Pollution control

- ✓ No dumping of any materials or storage of any equipment should be allowed within the sensitive areas, particularly the wetlands and riparian area.
- ✓ During all phases of the development activity, all waste should be removed to an appropriate waste facility and under no circumstance should waste materials or contaminants be discharged into the environment or buried.
- ✓ Washing and cleaning of equipment should also be done within berms or bunds, in order to trap any cement/sediment and prevent excessive soil erosion. These sites must be re-vegetated after development activity has been completed.

Surface water quality

- ✓ All development activity materials including fuels and oil should be stored in demarcated areas that are contained within berms/bunds to avoid the spread of any contamination into sensitive areas.
- ✓ Proactive measures should be enforced to ensure that work vehicles are up to standard regarding maintenance and function. These measures should include routine leak checks prior to development activity and decommissioning of vehicles and machinery not up to par.
- ✓ Dripping during the aforementioned leak checks and maintenance must be accommodated for by the provision of drip trays.
- ✓ Handling of hazardous substances should be kept to a minimum within the development activity site. Additionally, thorough training should be administered to site personnel regarding handling of the aforementioned substances.
- ✓ Regarding sanitation – portable chemical toilets should be made available to site personal and should be located +- 30m away from sensitive environments. Waste from the toilets should be collected and disposed of appropriately by a waste contractor.
- ✓ An emergency “clean up kit” containing spillage clean up materials should be readily available on site to be used in event of a spill.
- ✓ Fuels, chemicals and other hazardous substances should be stored in the appropriate, marked containers with closed lids.
- ✓ All spillages or contaminations are to be immediately reported to the Site Manager and Environmental Control Officer so that appropriate clean up measures may be enacted.
- ✓ Temporary noise should be kept to a minimum with equipment, machinery and vehicles, especially in sensitive areas.
- ✓ The site must be inspected frequently (daily during the development activity phase and monthly thereafter) to ensure that the integrity sensitive areas is maintained at all times.
- ✓ Additionally, readiness and professional execution of the clean-up contingency plan as well as the mitigation and rehabilitation is essential to ensure that the integrity of the sensitive areas is not compromised.

7. CONCLUSION

Afzelia Environmental Consultants (Pty) Ltd. was appointed by Greenmined Environmental (Pty) Ltd. to conduct a wetland delineation and functional assessment (WDFA) for the Kambreek prospecting right application site. The study area is located within the Sandfontein region, in the Khai-Mai Local Municipality, Namakwa District Municipality, and province of Northern Cape, South Africa. The prospecting site encompasses a portion of Klein Pella Farm, which is the largest date farm in South Africa, with the main Orange River situated towards the north. The Kambreek prospect right site will be assessed, via exploratory methods, such as drilling borehole cores to determine if the landscape is viable for natural resources/minerals.

A total of ten (10) proposed borehole cores will be drilled to extract the material for analysis. The layout for the proposed boreholes has not yet been finalised and represents an overview, which may be subject to change in the future. The drilling range of each proposed borehole will not exceed an area of 1m^2 in size.

This specialist wetland assessment was therefore undertaken to identify the location and extent of wetlands within the regulated 500m buffer of the study site; determine the functionality and health status of the "at risk' wetlands and identify the impacts of the proposed activity on the surrounding wetlands.

A comprehensive field survey was conducted to further assist in delineating the wetland boundaries and other sensitive areas which could be impacted from the Kambreek prospect right application (associated proposed boreholes). An individual wetland was identified within along the north-eastern edge of the prospecting right footprint. HGM1 is situated >900m away from the proposed borehole sites and therefore, this system was deemed not at risk to the proposed activities, due to the nature of the project, and position of the wetland in relation to the study area.

In conclusion, it is the opinion of the specialist that the Kambreek prospect right application project will not require authorisation.

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