Wetland Functional and Impact Assessment for the Proposed Kopanya Solar Photovoltaic (PV) 2 Project

Thaba Chweu Local Municipality, Ehlanzeni District Municipality in the Mpumalanga Province, South Africa

3 November 2026

Prepared by:

The Biodiversity Company

Cell: +27 81 319 1225

Fax: +27 86 527 1965

info@thebiodiversitycompany.com

www.thebiodiversitycompany.com

Report Name	**Wetland Functional and Impact Assessment for the Proposed Kopanya Solar Photovoltaic (PV) 2 Project**	
Specialist Theme	Aquatic Biodiversity Theme – Wetland Baseline and Impact Assessment	
Project Reference	Kopanya Solar PV 2 Project	
Date	3 November 2026	
Technical Support	Celine Klinkert (Can. Sci. Nat. 165111)[1]	
Report Reviewer & Responsible Specialist	Khume Mtshweni (Pr. Sci. Nat. 138592)	
Declaration	The Biodiversity Company and its associates act as independent consultants in accordance with the requirements of the South African Council for Natural Scientific Professions. We confirm that we have no affiliation with, or vested financial interest in, the proponent, other than remuneration for professional services rendered in terms of the Environmental Impact Assessment Regulations. We have no conflicting interests in the proposed activity or any secondary developments arising from the authorisation of the project, and our work has been undertaken objectively and in accordance with accepted scientific principles.	

[1] All work was completed under the supervision of a Professional Registered Scientist (Khume Mtshweni - Pr. Sci. Nat. 138592)

Executive Summary

The Biodiversity Company was appointed to undertake a wetland baseline and impact assessment in support of the environmental and water use authorisation processes for the proposed Kopanya Solar Photovoltaic (PV) 2 Project (the proposed Project). The proposed Project will be located Thaba Chweu Local Municipality, Ehlanzeni District Municipality, Mpumalanga Province, South Africa (Figure 1-1). A 500 metre (m) area has been demarcated for the proposed Project to facilitate the identification of wetlands within the regulatory zone, this area is referred to as the Project Area of Influence.

Booysendal Platinum (Pty) Ltd (hereafter referred to as the Applicant), proposes the development of a 20 megawatt alternating current (MW_{AC}) solar PV facility and associated infrastructure, referred to as the Kopanya Solar PV 2 Project (the proposed Project), at the existing Booysendal South (BS) Mine. Northam Platinum Proprietary Limited (Northam) owns and operates the Booysendal Mine, which comprises the Booysendal North and South mining complexes (hereafter collectively referred to as the Booysendal Mine)

Key Findings:

- Four wetland hydrogeomorphic (HGM) units were identified, namely one unchannelled valley bottom wetland (HGM 1), two seep wetlands (HGM 2 and 3) and one channelled valley bottom wetland (HGM 4). Three non-perennial drainage line, and artificial wet areas were identified within the broader Project Area of Influence.

- Of these, only two wetland features were assessed as potentially at risk from the proposed Project Area, namely HGM1 and HGM 2.

- The aquatic biodiversity sensitivity determined from The Screening Tool is classified as “Very High” attributed to the presence of multiple aquatic features. The results from the Screening Tool comparison concluded the aquatic sensitivities as:

    - High for the wetlands HGM 1 and HGM 4;

    - Medium for the wetlands HGM 2 and HGM 3, non-perennial drainage line, and watercourse buffer zones; and

    - Low for the artificial features and remaining area.

- The post-mitigation risks associated with the proposed Project Area were calculated to be of “Low” significance, provided that the prescribed mitigation measures are implemented.

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Table of Abbreviations and Units of Measure

Abbreviation / Unit	Full Meaning / Description
"	Second (used in GPS coordinates)
'	Minute (used in GPS coordinates)
°	Degree (used in GPS coordinates)
BESS	Battery Energy Storage System
Cand. Nat. Sci.	Candidate Natural Scientist (SACNASP registration)
DFFE	Department of Forestry, Fisheries and the Environment
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ESA	Ecological Support Areas
FEPA	Freshwater Ecosystem Priority Area
GN	Government Notice
GPS	Global Positioning System
ha	Hectare (unit of area)
HGM	Hydrogeomorphic
km	Kilometre (unit of distance)
m	Metre (unit of length)
m²	Square metre (unit of area)
MW	Megawatt (unit of power)
MWh	Megawatt-hour (unit of energy)
NEMA	National Environmental Management Act
NFEPA	National Freshwater Ecosystem Priority Area
PAOI	Project Area of Influence
Pr. Sci. Nat.	Professional Natural Scientist (SACNASP registration)
RAM	Risk Assessment Matrix
SAIIAE	South African Inventory of Inland Aquatic Ecosystems
SSV	Site Sensitivity Verification
SACNASP	South African Council for Natural Scientific Professions
SWSA	Strategic Water Source Areas
TBC	The Biodiversity Company

1 Introduction

1.1 Background

The Biodiversity Company was appointed to undertake a wetland baseline and impact assessment in support of the environmental and water use authorisation processes for the proposed Kopanya Solar Photovoltaic (PV) 2 Project (the proposed Project). The proposed Project will be located Thaba Chweu Local Municipality, Ehlanzeni District Municipality, Mpumalanga Province, South Africa (Figure 1-1). A 500 metre (m) area has been demarcated for the Project to facilitate the identification of wetlands within the regulatory zone, this area is referred to as the Project Area of Influence (PAOI).

This assessment has been completed in accordance with the requirements of the published Government Notice (GN) 4167 by the Department of Water and Sanitation (DWS) (previously GN 509 of 2016 and GN 3139 of 2023). The said notice was published, in December 2023, in the Government Gazette (No. 49833) in terms of Section 39 of the National Water Act, 1998 (Act No. 36 of 1998) (NWA), for a Water Use Licence (WUL) in terms of Section 21(c) & (i) water uses. The GN 4167 process provides an allowance to apply for a WUL for Section 21(c) & (i) under a General Authorisation (GA), as opposed to a full Water Use Licence Application. A water use (or potential) qualifies for a GA under GN 4167 when the proposed water use/activity is subjected to analysis using the DWS Risk Assessment Matrix (RAM), provided the identified risks are all considered a low risk, and the Applicant is listed under Appendix D1 or Appendix D2 of the same notice. This assessment will implement the RAM and provide a specialist opinion on the appropriate water use authorisation.

This assessment was conducted in accordance with the amendments to the Environmental Impact Assessment (EIA) Regulations, 2014 (GNR 326 in *GG* 40772 of 7 April 2017) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). The approach has taken cognisance of the recently published GN 320 (20 March 2020) and GN 1150 (30 October 2020) in terms of NEMA, dated 20 March and 30 October 2020*: "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 National Environmental Management Act, 1998, when applying for Environmental Authorisation"* (Reporting Criteria).

This report, after taking into consideration the findings and recommendations provided by the specialist herein, should inform and guide the Environmental Assessment Practitioner and regulatory authorities, enabling informed decision making with regards to the ecological viability of the proposed Project and related activities.

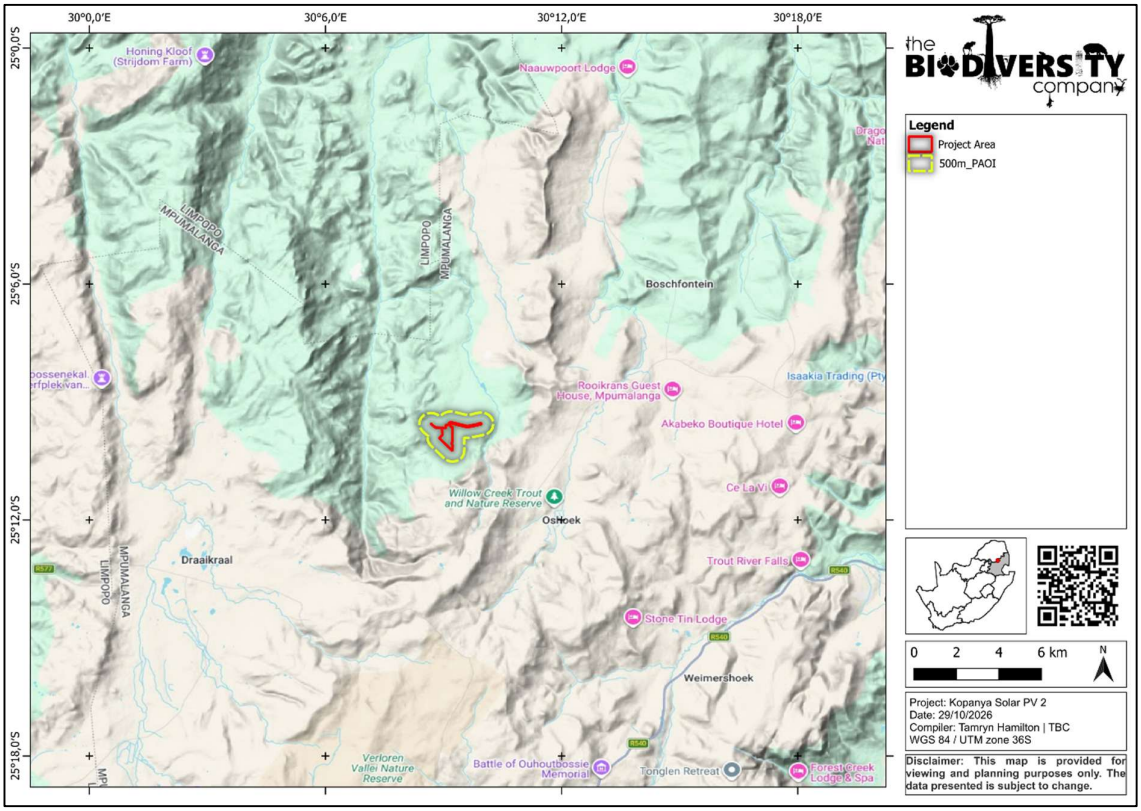


Figure 1-1 Map illustrating the regional locality of the proposed Project Area of Influence

1.2 Project Description

The following has been provided by GCS Environment South Africa (Pty) Ltd. The proposed Project Area, proposed layout and associated infrastructure is displayed in Figure 1-2.

1.2.1 Introduction

Booysendal Platinum (Pty) Ltd (the Applicant / Booysendal) proposes to develop the Kopanya Solar Photovoltaic 2 Project (the proposed Project), comprising a 20 megawatt alternating current (MWAC) utility-scale solar photovoltaic facility and associated infrastructure at the Booysendal South Mine in Mpumalanga Province. The proposed Project will be located within the existing Booysendal Mining Right held by Booysendal, a subsidiary of Northam Platinum Holdings Limited.

The proposed Project requires Environmental Authorisation (EA) in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), read with the Environmental Impact Assessment (EIA) Regulations, 2014 (as amended) Government Notice Regulation (GN R) 982[2] (EIA Regulations, 2014). A Basic Assessment (BA) process is being undertaken to assess potential environmental impacts and risks, consider reasonable and feasible alternatives, facilitate participation by interested and affected parties (I&APs) and relevant organs of state, and provide the competent authority with sufficient information to decide the application.

GCS Environment South Africa (Pty) Ltd (GCS) has been appointed as the independent Environmental Assessment Practitioner (EAP) responsible for managing the environmental assessment process,

[2] EIA Regulations, 2014, GN R 982 in GG 38282 of 4 December 2014, promulgated under sections 24(5) and 44 of the NEMA, with effect from 8 December 2014, as amended.

facilitating public participation and preparing the application documentation for submission to the Department of Mineral and Petroleum Resources (DMPR).

1.2.1.1 Project Background

The proposed Project will be located on Portion 8, the Remaining Extent of Portion 15 and Portion 17 of the Farm No. 53 JT, approximately 30 kilometres (km) west of Mashishing, within the Thaba Chweu Local Municipality and Ehlanzeni District Municipality. The proposed development footprint is approximately 41 hectares (ha).

The proposed Project will comprise up to approximately 35,000 bifacial photovoltaic panels mounted on single-axis tracking systems, together with an on-site substation, inverters, transformer stations, electrical houses, access and internal roads, operations and maintenance facilities, security and telecommunications infrastructure, and an overhead power line of up to 132 kilovolts (kV).

Electricity generated by the proposed Project will primarily supplement the electricity requirements of the Booysendal South Mine. The proposed Project forms part of Northam Platinum Holdings Limited's energy resilience and sustainability strategy.

1.2.2 Description of the Proposed Development

This section describes the principal components, supporting infrastructure and lifecycle activities associated with the proposed Project.

1.2.2.1 Project Overview

The Project comprises a 20 MWAC solar PV facility and associated grid connection and support infrastructure within the existing Booysendal South Mine. Electricity generated will primarily supply the Mine, with any surplus export subject to the applicable grid connection arrangements.

1.2.2.2 Project Components

1.2.2.2.1 Overview of the Proposed Facility

The facility will have an installed generation capacity of 20 MWAC and will integrate with existing mining and electrical infrastructure.

The proposed Project will utilise single-axis tracking bifacial solar photovoltaic panels to optimise solar exposure throughout the day. Locating the facility within an established mining area and using modular infrastructure may reduce the need for additional land disturbance.

1.2.2.2.2 Solar PV Arrays and Tracking System

The facility will comprise up to approximately 35,000 bifacial PV panels, each with a typical capacity greater than 600 watts (W), mounted on single-axis tracking systems to optimise energy yield.

The racking and tracking systems will be constructed from steel sections supported by driven piles, reducing the need for extensive concrete foundations and limiting ground disturbance. Panel structures will be designed to accommodate site-specific geotechnical conditions, wind loading, and long-term operational requirements.

1.2.2.2.3 Electrical Infrastructure and Grid Connection

The Project will include the following electrical and grid connection infrastructure:

- An overhead power line of up to 132 kV connecting the solar PV facility to the grid connection infrastructure;
- An on-site PV substation to collect and regulate electricity generated by the PV arrays;

- A substation adjacent to the existing Eskom substation; and
- Power transformer stations, inverters and associated electrical infrastructure housed in prefabricated units or electrical houses.

Electricity generated will primarily supply the Booysendal South Mine. Any surplus export will be subject to the final grid connection arrangements.

1.2.2.2.4 Temporary Construction Infrastructure

Temporary infrastructure required during the construction phase will include:

- A construction yard and laydown areas of approximately 1 ha;
- Site offices, storage areas, and temporary ablution facilities;
- Internal access roads and construction traffic routes; and
- Temporary services required to support construction activities.

Construction of the proposed Project is anticipated to occur over a period of approximately 15 months. At peak construction, an estimated 300 personnel will be employed, comprising skilled and semi-skilled labour associated with civil works, electrical installation, and commissioning activities.

1.2.2.2.5 Permanent Operational Infrastructure

Permanent operational infrastructure associated with the proposed Project will include:

- Buildings for operations, maintenance, control, and storage purposes;
- An operations and maintenance warehouse;
- Parking areas for operational staff and service vehicles; and
- Security facilities, including access control points.

The operational lifespan of the proposed Project is anticipated to be approximately 25 years, during which an estimated 20 personnel will be employed for routine operation, maintenance, and security functions.

1.2.2.2.6 Supporting Infrastructure and Services

Additional supporting infrastructure will include:

- Water-supply infrastructure and conservancy tanks for the collection of domestic wastewater;
- Internal and access roads, linking the facility to existing Mine infrastructure;
- Security and access control infrastructure, including perimeter fencing of up to approximately 3 100 metres (m); and
- Telecommunications systems to support monitoring, control, and security operations.

Stormwater infrastructure will be designed to maintain natural drainage patterns, promote dispersed flow and infiltration, and prevent erosion, sedimentation and concentrated discharge into wetlands and

drainage features. The final design may include vegetated swales, berms, energy dissipation measures, cross-drainage structures and sediment-control measures.

1.2.2.2.7 Water Requirements and Management

Water will be required during construction for dust suppression, concrete works and general construction activities. Total construction phase demand is estimated at approximately 1 790 m³.

Operational water demand, associated mainly with domestic use and routine maintenance, is estimated at approximately 518 m³/a.

Water will be sourced from existing authorised Mine supplies and/or boreholes. No new abstraction infrastructure is proposed, and water use will be managed in accordance with the Mine's water management procedures.

No process wastewater will be generated during normal operation. Domestic wastewater will be collected in conservancy tanks and removed by an appropriately authorised service provider for disposal at an approved facility.

1.2.2.2.8 Waste Management

Waste generated during construction, operation and decommissioning will be managed in accordance with the Mine's approved waste management procedures, the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), and applicable good practice.

1.2.2.2.8.1 Construction Phase Waste

During the construction phase, both non-hazardous and hazardous waste streams will be generated. Waste volumes are anticipated to be temporary and largely associated with civil works, installation activities, and workforce-related activities.

Non-hazardous waste will include:

- General domestic waste generated by construction personnel;
- Packaging materials associated with solar PV components, including wooden pallets, cardboard, plastics, polystyrene, and strapping materials;
- Scrap metal arising from mounting structures, tracker systems, cable trays, and minor steel off-cuts;
- Construction off-cuts, including electrical cabling, conduits and plastic materials;
- Minor quantities of inert waste, such as concrete residues generated during foundation works; and
- Damaged, defective, or broken solar PV panels arising from transport, handling, or installation activities.

Solar PV panels damaged during delivery or installation will be handled with care to prevent further breakage. Intact but defective panels will, where possible, be returned to the supplier under warranty agreements. Broken panels will be stored in a designated, secure area to prevent glass dispersion and environmental contamination. Panels suitable for recycling will be sent to appropriately authorised recycling facilities.

Hazardous waste generated during construction will be limited in volume and will include:

- Small quantities of waste fuels, oils and hydraulic fluids generated during the use and maintenance of construction vehicles and equipment;
- Oily rags, absorbent materials, used filters, and contaminated materials; and
- Empty containers that previously contained hazardous substances, such as oils, greases, and cleaning agents.
- Hazardous waste will be stored in clearly demarcated, bunded areas with impermeable surfaces. Waste will be removed by appropriately registered or authorised service providers and taken to authorised facilities.

1.2.2.2.8.2 Operational Phase Waste

Waste generation during the operational phase is expected to be minimal and largely associated with routine maintenance and administrative activities.

- Non-hazardous waste during operation will primarily include:
- Limited domestic waste generated by operational and maintenance personnel;
- Minor packaging waste associated with spare parts and replacement components; and
- Scrap metal and redundant components arising from maintenance activities.
- Hazardous or potentially hazardous waste may include:
- Used oils, lubricants, and cleaning materials associated with maintenance activities;
- Oily rags, absorbent materials and used filters;
- Damaged or replaced solar PV panels arising from storm events, mechanical failure, vandalism, or routine replacement; and
- Electrical components such as inverters or transformers containing oils or electronic parts.

Damaged, defective and end-of-life PV panels will be assessed and managed according to their condition and applicable waste classification requirements. Supplier take-back, reuse and recycling will be prioritised where reasonably available, and panels awaiting removal will be stored in a secure, weather-protected area.

All operational waste will be collected, transported and disposed of in accordance with approved waste management procedures.

1.2.2.2.8.3 Decommissioning phase Waste

At the end of the proposed Project's operational lifespan, the facility may be decommissioned, repowered, or refurbished. The decommissioning phase will generate both non-hazardous and hazardous waste streams associated with dismantling and removal of infrastructure.

Waste generated during decommissioning will include:

- Non-hazardous waste, such as dismantled equipment, scrap metal, concrete material, fencing, and general waste associated with infrastructure removal;

- Solar PV panels, including damaged, obsolete, or end-of-life panels and associated mounting structures and electrical components; and

- Hazardous waste, including electronic components, oils and other hazardous materials.

Solar PV panels removed during decommissioning will represent a primary waste stream. Functional panels may be reused, resold or incorporated into a repowering programme, while end-of-life panels will be prioritised for recycling to recover glass, aluminium frames and other reusable materials.

Electrical components, including inverters and transformers, will be assessed for potential refurbishment or recycling. Hazardous materials will be separated and managed in accordance with applicable waste legislation.

Decommissioning waste will be transported by appropriately registered or authorised service providers to authorised waste management or recycling facilities. Material recovery, reuse and recycling will be prioritised to minimise disposal to landfill.

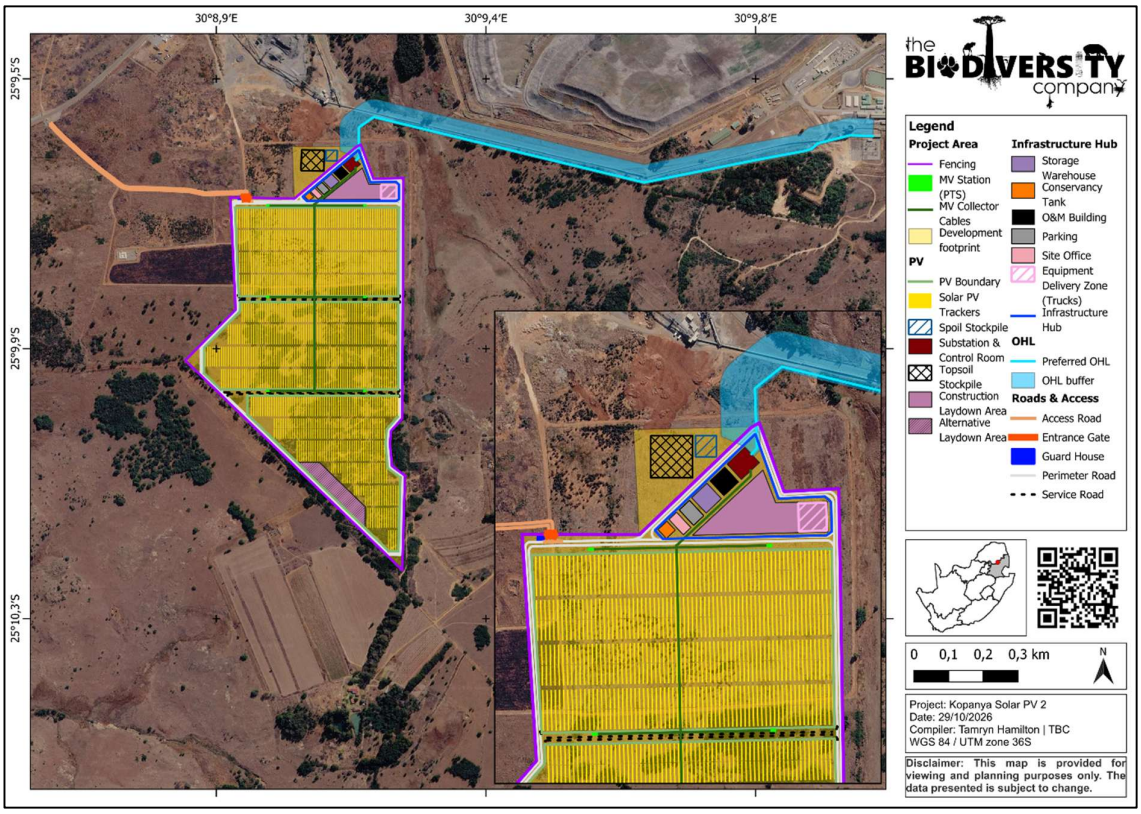


Figure 1-2 Proposed project infrastructure of the proposed development

1.3 Scope of Work

The following tasks were completed in fulfilment of the terms of reference for this assessment:

- A desktop assessment of available and related datasets to provide context of the freshwater biodiversity of the proposed Project Area and to indicate potential wetland areas;

- The delineation, classification and assessment of wetlands within 500 m of the proposed Project Area;

- An assessment of the related impacts through the use of the DWS RAM (DWS, 2023);
- The provision of recommendations relevant to associated impacts; and
- Report compilation detailing the baseline findings.

1.4 Assumptions and Limitations

The following aspects were considered as limitations:

- It has been assumed that the spatial files provided to the specialist are accurate;
- Only the proposed boundary of the proposed Project Area and Overhead Line Corridor was provided during the time of the field survey and report;
- The seasonality of the surveys is not considered to be a limiting factor with regard to the identification and delineation of wetlands, the only limitation in this regard would be the identification of certain plant species. The results of the assessment are considered conclusive in the opinion of the specialist;
- Freshwater features within the larger 500 m PAOI were delineated and assessed via desktop;
- Areas characterised by external wetland attributes were the focus for this assessment, where potential wetlands were thereafter confirmed by soil form indicators;
- Representative sampling within the proposed Project Area was conducted and by its nature would result in some parts of the Project Area not being covered on foot. However, the results derived were sufficient to derive a meaningful baseline of the study area in the context of freshwater ecosystems; and
- The Global Positioning System used for water resource delineations is accurate to within five metres. Therefore, the wetland delineation plotted digitally may be offset by a maximum of five metres to either side.

1.5 Key Legislative Requirements

The legislation, policies and guidelines listed below in Table 1-1 are applicable to the proposed Project. The list below, although extensive, may not be complete and other legislation, policies and guidelines may apply in addition to those listed below.

Table 1-1 A list of key legislative requirements

Region	Legislation / Guideline	Comment
National	National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA)	To provide for the effective protection and controlled utilisation of the environment and for matters incidental thereto.
	NEMA: Environmental Impact Assessment Regulations (2014) (GNR 326 in *GG* 40772 of 7 April 2017), Appendix 6 requirements	Minimum content for specialist reports.
	NEMA: Government Notice (GN) 320 (20 March 2020) and GN 1150 (30 October 2020)	The minimum criteria for reporting. Protocol for the specialist assessment and minimum report content requirements.
	The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA), Threatened or Protected Species Regulations	The protection of species and ecosystems that warrant protection.
	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)	The regulation of waste management to protect the environment.

	National Water Act,1998 (Act No. 36 of 1998) (NWA)	To provide for the regulation of water uses.
	NWA: GN 4167 (previously GN 509 of 2016 and GN 3139 of 2023)	Water Use Licence in terms of Section 21(c) & (i) water uses and the provision to apply for a General Authorisation subject to usage and outcome of the Risk Assessment Matrix.
	NEMBA: Alien and Invasive Species Regulations (2014) (GNR R598, 1 August 2014)	The regulation and management of alien invasive species.
	Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) (CARA)	To provide for control over the utilisation of the natural agricultural resources, including the vegetation and the combating of weeds and invader plants.
Provincial	Mpumalanga Nature Conservation Act, 1998 (Act No. 10 of 1998)	To consolidate and amend the laws relating to nature conservation within the Province and to provide for matters connected therewith.
	Adoption of the Mpumalanga Biodiversity Sector Plan (Provincial Gazette Notice No. 3535)	A spatial tool comprising of set of maps of biodiversity priority areas accompanied by contextual information and land use guidelines for use in land use and development planning, environmental assessment and regulation, and natural resource management.

1.6 National Water Act, 1998

The DWS is the custodian of South Africa's water resources and therefore assumes public trusteeship of water resources, which includes watercourses, surface water, estuaries, or aquifers. The NWA allows for the protection of water resources, which includes:

- The maintenance of the quality of the water resource to the extent that the water resources may be used in an ecologically sustainable way;
- The prevention of the degradation of the water resource; and
- The rehabilitation of the water resource.

A watercourse means:

- A river or spring;
- A natural channel in which water flows regularly or intermittently;
- A wetland, lake or dam into which, or from which, water flows; and
- Any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks.

The NWA recognises that the entire ecosystem and not just the water itself, and any given water resource constitutes the resource and as such needs to be conserved. No activity may therefore take place within a watercourse unless it is authorised by the DWS. Any area within a wetland or riparian zone is therefore excluded from development unless authorisation is obtained from the DWS in terms of Section 21 (c) & (i).

1.7 National Environmental Management Act, 1998

The NEMA and the associated Regulations as amended in GNR 326 in *GG* 40772 of 7 April 2017, states that prior to any development taking place within a wetland or riparian area, an environmental authorisation process needs to be followed. This could follow either the Basic Assessment (BA) or EIA process depending on the scale of the impact.

1.8 Legislative Framework

In line with the Reporting Criteria the following has been assumed:

- An Applicant intending to undertake an activity identified in the scope of this protocol on a site identified on the screening tool as being of:
    - "Very high sensitivity" for aquatic biodiversity, must submit an Aquatic Biodiversity Specialist Assessment;
    - "Low sensitivity" for aquatic biodiversity, must submit an Aquatic Biodiversity Compliance Statement;
- Where the information gathered from the site sensitivity verification differs from the screening tool designation of "very high" aquatic biodiversity sensitivity, and it is found to be of a "low" sensitivity, an Aquatic Biodiversity Compliance Statement must be submitted;
- Similarly, where the information gathered from the site sensitivity verification differs from the screening tool designation of "low" aquatic biodiversity sensitivity, and it is found to be of a "very high" sensitivity, an Aquatic Biodiversity Specialist Assessment must be submitted.

Given that wetlands were identified within proximity of the proposed Project Area, a Specialist Assessment Report was undertaken.

According to GN 320, an Aquatic / Freshwater Biodiversity Specialist Assessment Report must contain the information as presented in Table 1-2 below.

Table 1-2 Aquatic Biodiversity Specialist Assessment information requirements as per the relevant protocol, including the location of the information within this report

Information to be Included (as per GN 320, 20 March 2020)	Report Section
The assessment must be prepared by a specialist registered with the South African Council for Natural Scientific Professionals (SACNASP) with expertise in the field of aquatic sciences	8.4
Contact details of the specialist, their SACNASP registration number, their field of expertise and a curriculum vitae	8.4
A signed statement of independence by the specialist(s)	8.3
The assessment must be undertaken on the preferred site and within the proposed development footprint	1.2
A baseline description of the aquatic biodiversity and ecosystems on the site, including: aquatic ecosystem types; presence of aquatic species, and composition of aquatic species communities, their habitat, distribution and movement patterns.	3.1.4
The threat status of the ecosystem and species as identified by the screening tool	3.7.1
An indication of the national and provincial priority status of the aquatic ecosystem, including a description of the criteria for the given status (i.e. if the site includes a wetland or a river freshwater ecosystem priority area or sub-catchment, a strategic water source area, a priority estuary, whether or not they are free-flowing rivers, wetland clusters, a critical biodiversity or ecologically sensitivity area)	3.1.4
A description of the Ecological Importance and Sensitivity of the aquatic ecosystem including: (a) the description (spatially, if possible) of the ecosystem processes that operate in relation to the aquatic ecosystems on and immediately adjacent to the site (e.g., movement of surface and subsurface water, recharge, discharge, sediment transport, etc.); and (b) the historic ecological condition (reference) as well as Present Ecological State of rivers (in- stream, riparian and floodplain habitat), wetlands and/or estuaries in terms of possible changes to the channel and flow regime (surface and groundwater)	3.4
The assessment must identify alternative development footprints within the preferred site which would be of a "low" sensitivity as identified by the screening tool and verified through the site sensitivity verification and which were not considered appropriate	-

Related to impacts, a detailed assessment of the potential impacts of the proposed development on the following aspects must be undertaken to answer the following questions: Is the proposed development consistent with maintaining the priority aquatic ecosystem in its current state and according to the stated goal? Is the proposed development consistent with maintaining the resource quality objectives for the aquatic ecosystems present? How will the proposed development impact on fixed and dynamic ecological processes that operate within or across the site? This must include: (a) impacts on hydrological functioning at a landscape level and across the site which can arise from changes to flood regimes (e.g. suppression of floods, loss of flood attenuation capacity, unseasonal flooding or destruction of floodplain processes); (b) will the proposed development change the sediment regime of the aquatic ecosystem and its sub-catchment (e.g. sand movement, meandering river mouth or estuary, flooding or sedimentation patterns); (c) what will the extent of the modification in relation to the overall aquatic ecosystem be (e.g. at the source, upstream or downstream portion, in the temporary / seasonal / permanent zone of a wetland, in the riparian zone or within the channel of a watercourse, etc.); and (d) to what extent will the risks associated with water uses and related activities change.	4
How will the proposed development impact on the functioning of the aquatic feature? This must include: (a) base flows (e.g., too little or too much water in terms of characteristics and requirements of the system); (b) quantity of water including change in the hydrological regime or hydroperiod of the aquatic ecosystem (e.g., seasonal to temporary or permanent; impact of over -abstraction or instream or off stream impoundment of a wetland or river); (c) change in the hydrogeomorphic typing of the aquatic ecosystem (e.g., change from an unchannelled valley-bottom wetland to a channelled valley -bottom wetland); (d) quality of water (e.g., due to increased sediment load, contamination by chemical and/or organic effluent, and/or eutrophication); (e) fragmentation (e.g., road or pipeline crossing a wetland) and loss of ecological connectivity (lateral and longitudinal); and (f) the loss or degradation of all or part of any unique or important features associated with or within the aquatic ecosystem (e.g., waterfalls, springs, oxbow lakes, meandering or braided channels, peat soils, etc.)	-
How will the proposed development impact on key ecosystems regulating and supporting services especially: (a) flood attenuation; (b) streamflow regulation; (c) sediment trapping; (d) phosphate assimilation; (e) nitrate assimilation; (f) toxicant assimilation; (g) erosion control; and (h) carbon storage?	-
How will the proposed development impact community composition (numbers and density of species) and integrity (condition, viability, predator-prey ratios, dispersal rates, etc.) of the faunal and vegetation communities inhabiting the site?	-
A statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment	2.1
The methodology used to undertake the site inspection and the specialist assessment, including equipment and modelling used, where relevant	8.1
A description of the assumptions made, any uncertainties or gaps in knowledge or data	1.4
The location of areas not suitable for development, which are to be avoided during construction and operation, where relevant	3.5
Additional environmental impacts expected from the proposed development	-
Any direct, indirect and cumulative impacts of the proposed development on site	4
The degree to which impacts and risks can be mitigated	4
The degree to which the impacts and risks can be reversed	4
The degree to which the impacts and risks can cause loss of irreplaceable resources	-
A suitable construction and operational buffer for the aquatic ecosystem, using the accepted methodologies	3.5
Proposed impact management actions and impact management outcomes for inclusion in the Environmental Management Programme (EMPr)	5

A motivation must be provided if there were development footprints identified as having a "low" aquatic biodiversity sensitivity and that were not considered appropriate	3.7.2
A substantiated statement, based on the findings of the specialist assessment, regarding the acceptability or not of the proposed development and if the proposed development should receive approval or not; and	6.2
Any conditions to which this statement is subjected	6.2

A signed copy of the assessment must be appended to the BA or EIA report.

2 Fieldwork

2.1 Freshwater Biodiversity Field Assessment

A field survey for the area was undertaken from the 26th – 30th of January 2026, constituting a wet-season survey, to identify the presence of freshwater features (wetlands) and to delineate their spatial extents. Furthermore, to determine vegetation composition of the identified features and the likelihood of features to be used as habitat for fauna. The seasonality of the surveys is not considered to be a limiting factor with regard to the identification and delineation of wetlands, the only limitation in this regard would be the identification of certain plant species. The results of the assessment are considered conclusive in the opinion of the specialist.

3 Results and Discussion

3.1 Desktop Dataset Assessment

3.1.1 Climate

The climate for the Sekhukhune Montane Grassland vegetation type was used to draw inferences about the climate for the region. The Sekhukhune Mountain Bushveld region experiences a climate characterised by a summer rainfall regime with a Mean Annual Precipitation (MAP) from about 720 millimetres (mm) in the east to 600 mm in the west. The majority of the rainfall occurs in the form of thunderstorms in summer from November to January. The mean daily temperature ranges from a minimum of 2.8 degrees centigrade (°C) in winter to a maximum of 24.9°C in summer. The daily temperatures vary considerably at different localities, with higher temperatures occurring on the plains and lower temperatures occurring on higher-lying plateaus (Mucina & Rutherford, 2006; Figure 3-1).

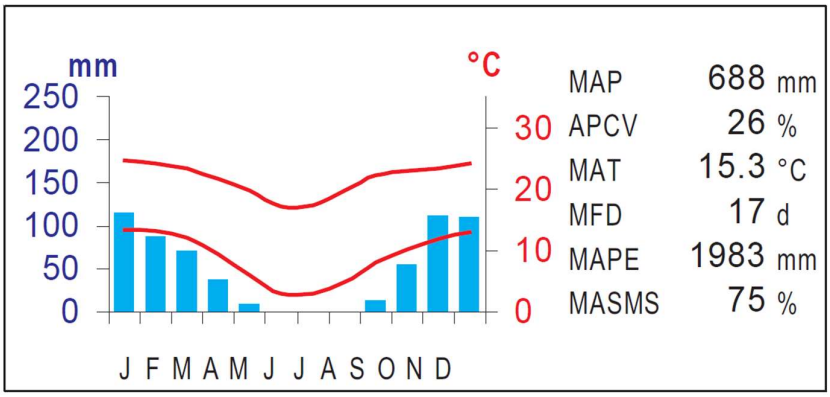


Figure 3-1 Climate for the proposed Project Area based on the Sekhukhune Montane Grassland vegetation type (Mucina & Rutherford, 2006)

3.1.2 Soils and Geology

The geology of this region mostly overlies the mafic intrusive rocks of the Upper and Main Zones of the Rustenburg Layered Suite, which is economically the most important part of the Bushveld Igneous Complex (Vaalian Erathem). The western region of this area is dominated by diorite and gabbro (often magnetite-rich) of the Roossenekal Subsuite, whereas the east is dominated by gabbro and norite of

the Dsjate Subsuite. In the extreme northeast of the area are metasediments of the Pretoria Group (also Vaalian Erathem) that were metamorphosed by the intrusion of the Bushveld Igneous Complex. Substrates of the undulating hills are generally heterogeneous rocky areas with miscellaneous soil types and those of the southern plains have diagnostic horizons that are vertic, melanic or red-structured. The dominant soil forms occurring in this region have a high clay content and include Arcadia, Mayo, Milkwood, Mispah, Shortlands and Steendal. The Ea land type covers 40% of the area, with minor occurrences of the Ib and Ab land types (Mucina & Rutherford, 2006).

According to the Land Type Database (Land Type Survey Staff, 1972 - 2006), the PAOI is predominantly characterised by the Ab 29 land type. The Ab land type consists of red-yellow apedal soils, which are freely draining. Additionally, red, dystrophic and/or mesotrophic soil forms also occur within this land type.

3.1.3 Hydrological Characteristics

The PAOI falls within the Eastern Bakenveld Ecoregion, within the Limpopo-Olifants Water Management Area. At a finer scale, predominantly within the B41G quaternary catchment. The fine scale hydrological features are presented in the following section.

3.1.3.1 Topographical River Lines and Inland Water Areas

The topographical river line dataset indicated several topographical non-perennial drainage features, two of which are located on the border of the 500 m PAOI (Figure 3-2). No inland water areas were identified within the PAOI.

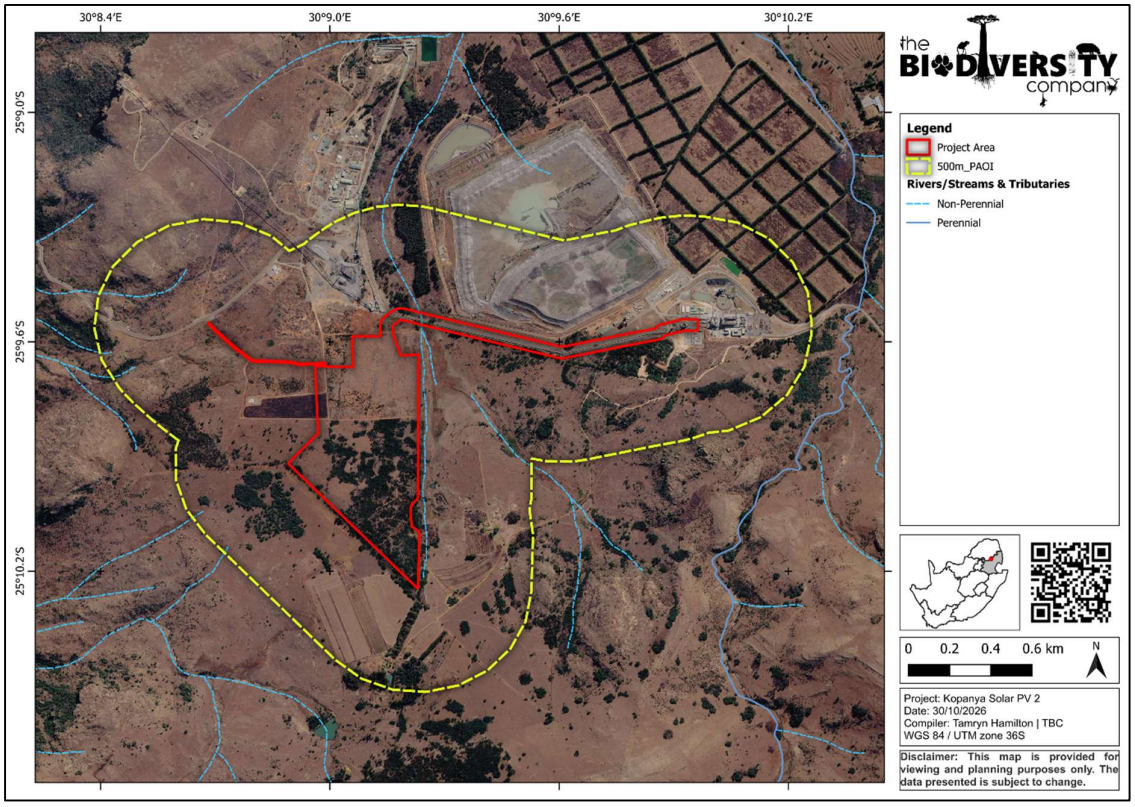


Figure 3-2 Topographical river lines that intersect the proposed Project Area of Influence

3.1.4 Ecologically Important Landscape Features

The Geographic Information System (GIS) analysis pertaining to the relevance of the proposed Project to ecologically important landscape features is summarised in Table 3-1. Only features that were identified to be relevant to the proposed Project were further discussed.

Table 3-1 Summary of relevance of the proposed Project to ecologically important landscape features

Desktop Information Considered	Relevant/Irrelevant	Section
South African Inventory of Inland Aquatic Ecosystems (SAIIAE)	Relevant – Project Area of Influence (PAOI) overlaps with a SAIIAE wetland.	3.1.4.1
National Freshwater Priority Area (NFEPA)	Relevant – PAOI overlaps with a NFEPA wetland.	3.1.4.2
Mpumalanga Biodiversity Sector Plan (MBSP)	Relevant – PAOI overlaps with Ecological Support Areas.	3.1.4.3
Strategic Water Source Areas (SWSA)	Irrelevant – PAOI does not overlap with a SWSA.	-

3.1.4.1 South African Inventory of Inland Aquatic Ecosystems

According to the South African Inventory of Inland Aquatic Ecosystems (SAIIAE) one channelled valley bottom wetland occurs within the PAOI (Figure 3-3). The wetland condition as per the dataset is "C – Moderately Modified". The wetland is classified as "Critically Endangered" and "Not Protected" with regard to Ecosystem Threat Status and Ecosystem Protection Level, respectively.

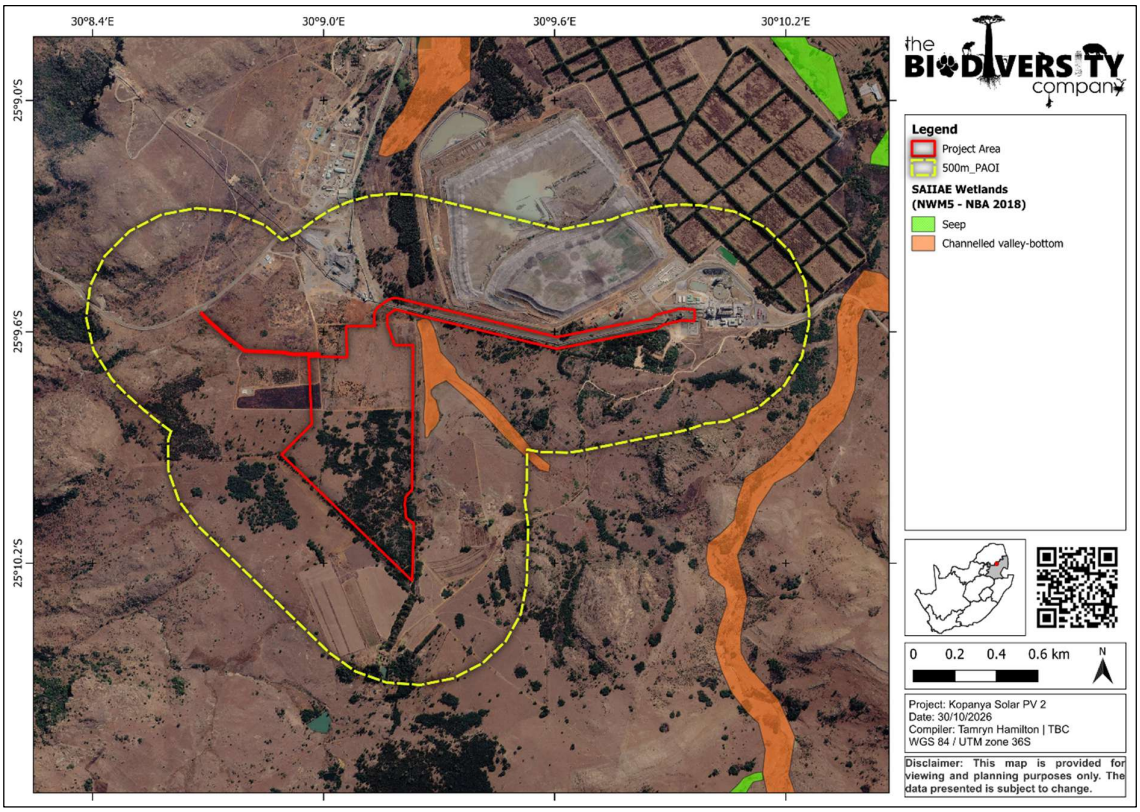


Figure 3-3 Wetland feature identified within the proposed Project Area of Influence according to the South African Inventory of Aquatic Ecosystems dataset

3.1.4.2 National Freshwater Ecosystem Priority Areas

Two wetlands were identified within the PAOI by means of the NFEPA dataset, namely two channelled valley bottom wetlands (Figure 3-4). The channelled valley bottom wetlands are classified as a "Non-Priority" wetlands, according to the dataset.

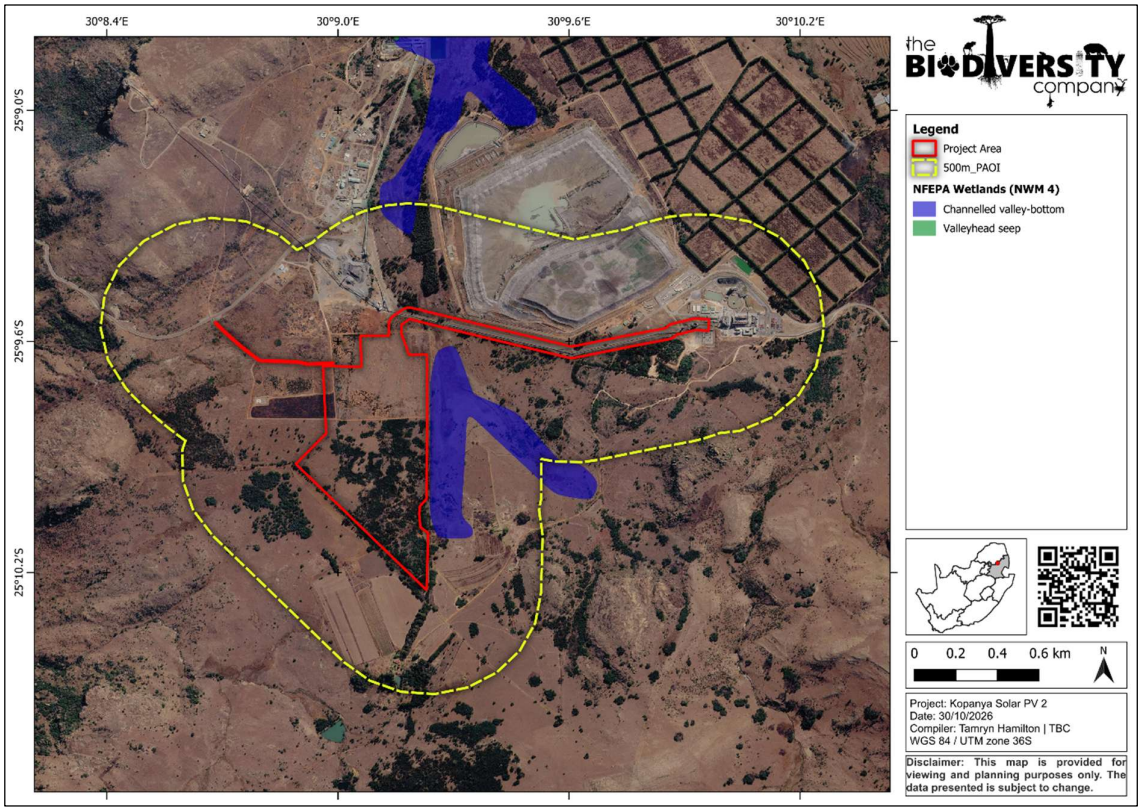


Figure 3-4 Wetland feature identified within the proposed Project Area of Influence according to the National Freshwater Ecosystem Priority Areas dataset

3.1.4.3 Mpumalanga Biodiversity Spatial Plan

According to the Mpumalanga Biodiversity Spatial Plan (MBSP) (Figure 3-3), a large portion of the PAOI falls within Ecological Support Area (ESA): Important Subcatchments. Additionally, a small portion of the PAOI overlaps with an ESA: Wetlands area. The remaining areas are classified as "Heavily Modified" areas.

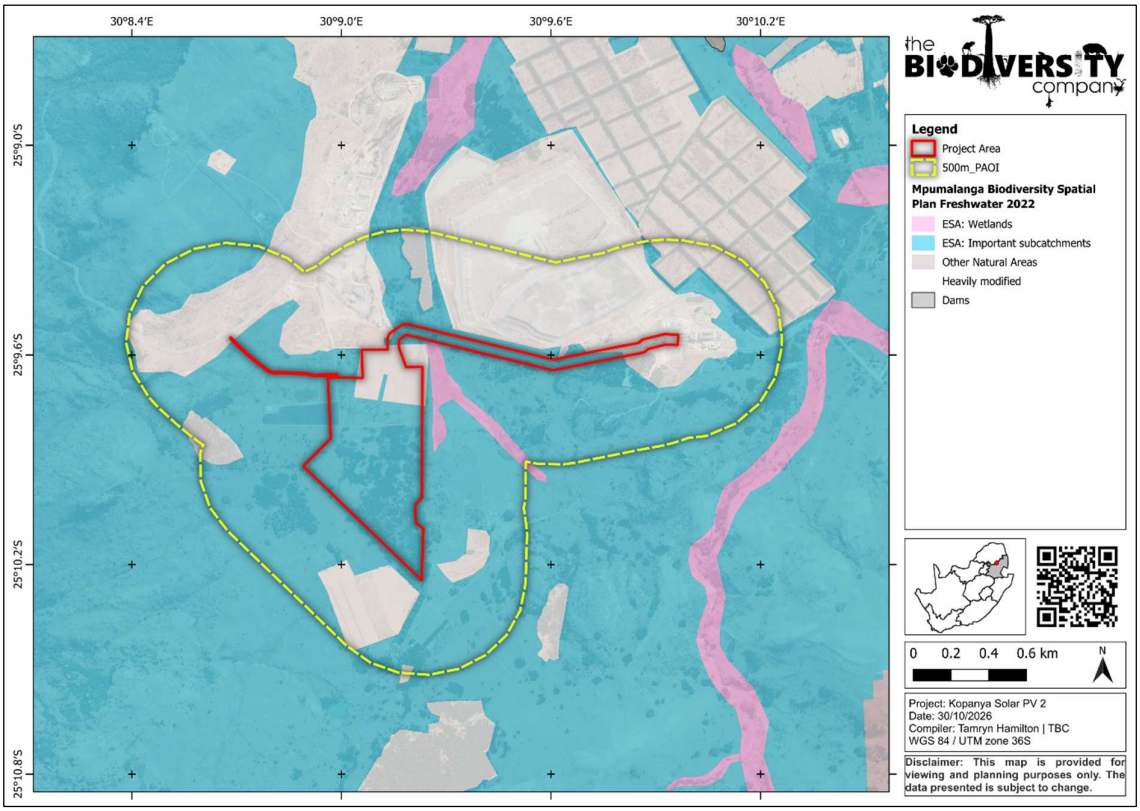


Figure 3-5 Mpumalanga Biodiversity Spatial Plan overlay for the proposed Project Area of Influence

3.2 Wetland Field Survey

3.2.1 Delineation

Wetlands were grouped according to type and observed similarities and were delineated for a larger area than depicted on the maps. Wetland delineations (including hydrogeomorphic (HGM) numbering) were therefore extracted and only relevant features to this proposed Project were further discussed.

Four HGM units were identified within the PAOI (Figure 3-6), consisting of one unchannelled valley bottom wetland (HGM 1) containing an instream dam, two seep wetland systems (HGM 2 and 3) and one channelled valley bottom wetland (HGM 4). Additionally, three non-perennial drainage lines were identified within the larger PAOI, as well as artificial wet areas resulting from mining operations (Figure 3-7).

The non-perennial drainage features are referred to as an 'A' Section channels that convey surface runoff immediately after a storm event and are not associated with a baseflow (DWAF, 2005).

A summary of the wetland area and percentage cover of the wetlands within the PAOI is provided in Table 3-2.

Table 3-2 Summary of wetland area within the proposed Project Area of Influence

Hydrogeomorphic (HGM) Unit	Area (ha)	Area (%)
HGM 1	18.6	89.90
HGM 2	0.3	1.45
HGM 3	1.5	7.20

HGM 4	0.3	1.45
Total	**20.7**	**100**

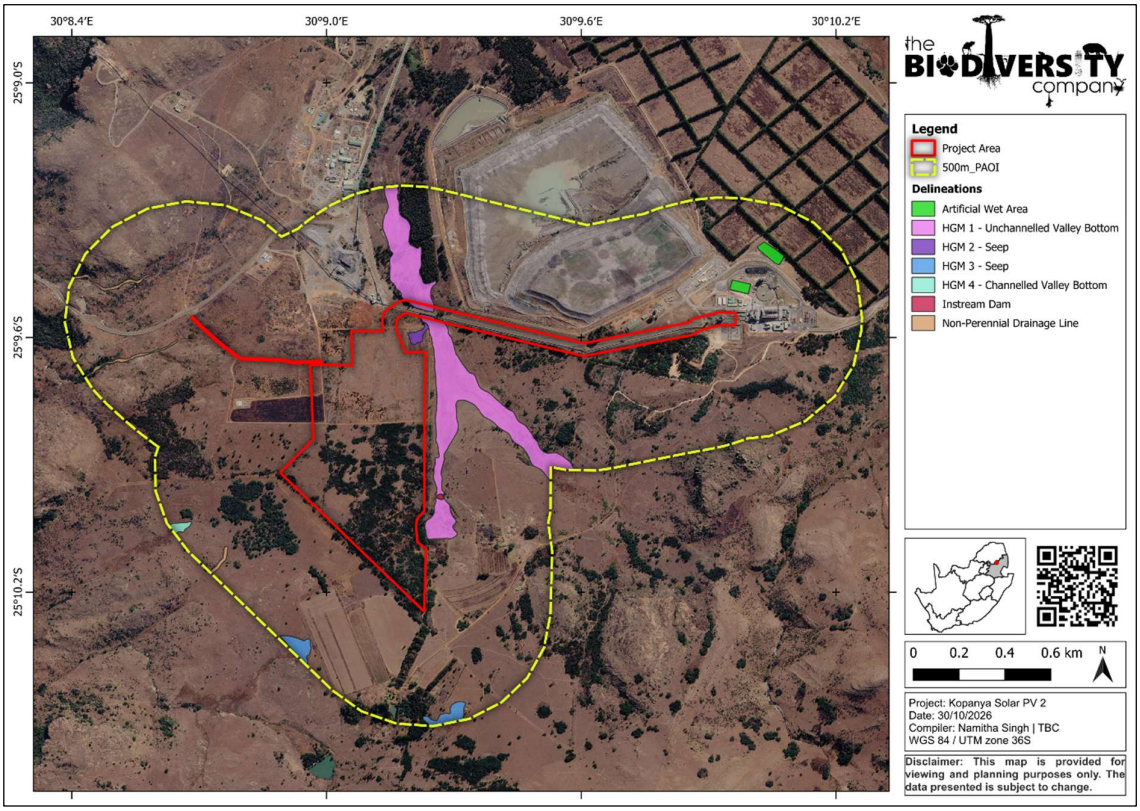


Figure 3-6 Delineation of the identified watercourses within the proposed Project Area of Influence

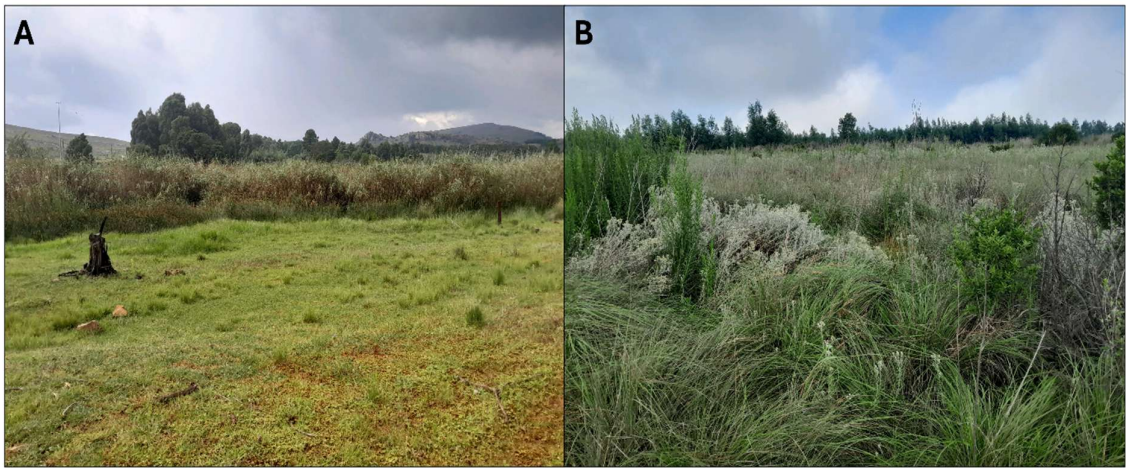


Figure 3-7 Representative photographs of the different identified features within the proposed Project Area of Influence. A) Unchannelled valley bottom; and B) Seep

3.2.2 Classification and Description

The wetland classification as per South African National Biodiversity Institute (SANBI) guidelines (Ollis *et al.,* 2013) is presented in Table 3-3.

Table 3-3 Wetland classification as per SANBI guideline (Ollis et al., 2013)

Wetland Unit	Level 1	Level 2		Level 3	Level 4		
	System	Department of Water and Sanitation Ecoregion/s	National Freshwater Priority Area Wetland Vegetation Group	Landscape Unit	4A (HGM)	4B	4C
Hydrogeomorphic (HGM) 1	Inland	Eastern Bakenveld Ecoregion	Mesic Highveld Grassland Group 7	Valley Floor	Unchannelled valley bottom	N/A	N/A
HGM 2				Slope	Seep	With channelled outflow	N/A
HGM 3				Slope	Seep	Without channelled outflow	N/A
HGM 4				Valley Floor	Channelled valley bottom	N/A	N/A

An unchannelled valley bottom wetland, is a wetland located on a valley floor, characterised by the absence of a distinct river channel (Ollis *et al.,* 2013). These wetlands are defined by their diffuse water flows, which are not confined within channel banks, allowing water to spread across the valley floor. The primary water inputs for unchannelled valley bottom wetlands include diffuse surface and subsurface flows from upstream channels that lose confinement, as well as seepage from adjacent valley side-slopes. The hydrodynamics of these wetlands are dominated by horizontal, unidirectional, diffuse surface flow, although infiltration and evapotranspiration can also be significant. This setting allows unchannelled valley bottom wetlands to function as important sites for sediment deposition, water filtration, and habitat provision, supporting a diverse range of plant and animal species. Their unique hydrological and geomorphological characteristics make them vital components of the landscape, contributing to the overall ecological health of the valley systems in which they occur. Figure 3-8 presents a diagram of a typical unchannelled valley bottom wetland, showing the dominant movement of water into, through and out of the system.

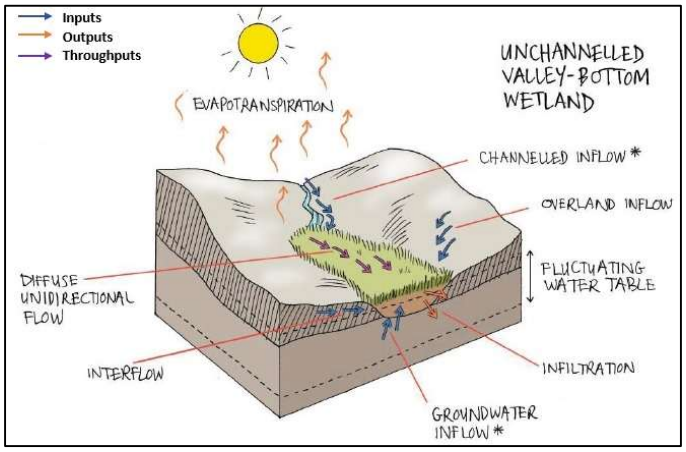


Figure 3-8 Amalgamated diagram of a typical unchannelled valley bottom, highlighting the dominant water inputs, throughputs and outputs, SANBI guidelines (Ollis et al. 2013)

A seep wetland is typically located on gently to steeply sloping land and is characterised by the colluvial, unidirectional movement of water and material downslope (Ollis *et al.,* 2013). Seeps are often found on the side-slopes of a valley but do not usually extend onto the valley floor. The primary water inputs for

seeps are subsurface flows from an upslope direction, with water movement through the seep mainly occurring as interflow. During and after rainfall events, diffuse overland flow, known as sheetwash, can also be significant. Seeps are associated with geological formations and topographic positions that either cause groundwater to discharge to the land surface or rain-derived water to seep downslope as subsurface interflow. This unique hydrological setting allows seeps to support specific vegetation adapted to these conditions, contributing to their ecological significance in the landscape. Figure 3-9 illustrates a diagram of the hillslope seeps, showing the dominant movement of water into, through and out of the system.

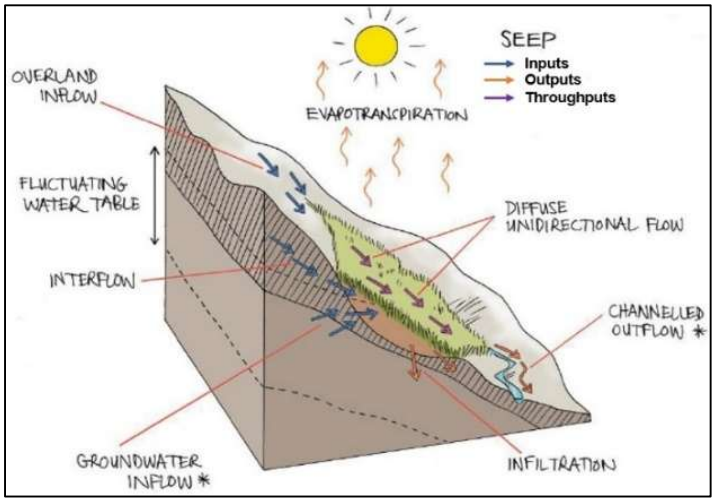


Figure 3-9 Amalgamated diagram of a typical seep, highlighting the dominant water inputs, throughputs and outputs, SANBI guidelines (Ollis et al., 2013)

A channelled valley bottom wetland, is a wetland ecosystem located along a valley floor, characterised by the presence of a river channel running through it (Ollis *et al.,* 2013). These wetlands are distinct from floodplain wetlands due to the absence of characteristic floodplain features and the presence of a defined river channel. The landscape setting of a channelled valley bottom wetland typically involves a valley floor where the wetland receives water inputs from the river channel, either as surface flow during flooding or as subsurface flow, and from adjacent valley side-slopes through overland flow or interflow. The hydrodynamics of these wetlands are influenced by the river channel, which provides a concentrated flow of water, contributing to the wetland's ecological functions such as sediment trapping, nutrient cycling, and habitat provision. This setting makes channelled valley bottom wetlands crucial for maintaining the ecological integrity of riverine systems and supporting biodiversity. Figure 3-10 presents a diagram of a typical channelled valley bottom, showing the dominant movement of water into, through and out of the system.

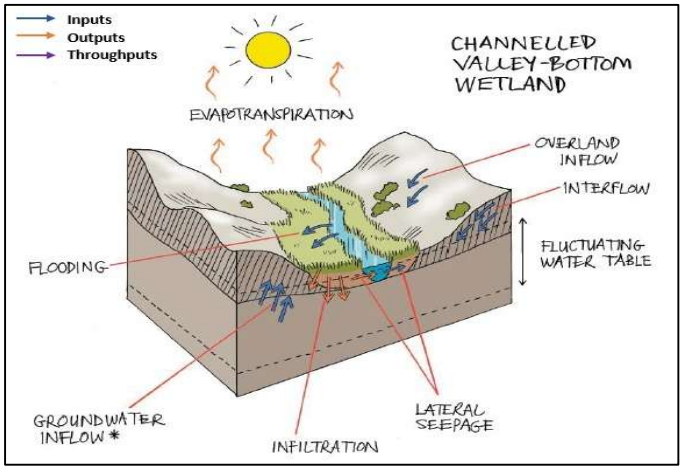


Figure 3-10 Amalgamated diagram of a typical channelled valley bottom, highlighting the dominant water inputs, throughputs and outputs, SANBI guidelines (Ollis et al. 2013)

The Department of Water Affairs and Forestry (DWAF) (2005) manual separates the classification of watercourses into three separate types of channels or sections defined by their position relative to the zone of saturation in the riparian area (Figure 3-11). The classification system separates channels into:

- those that do not have baseflow ('A' Sections);
- those that sometimes have baseflow ('B' Sections) or non-perennial; or
- those that always have baseflow ('C' Sections) or perennial.

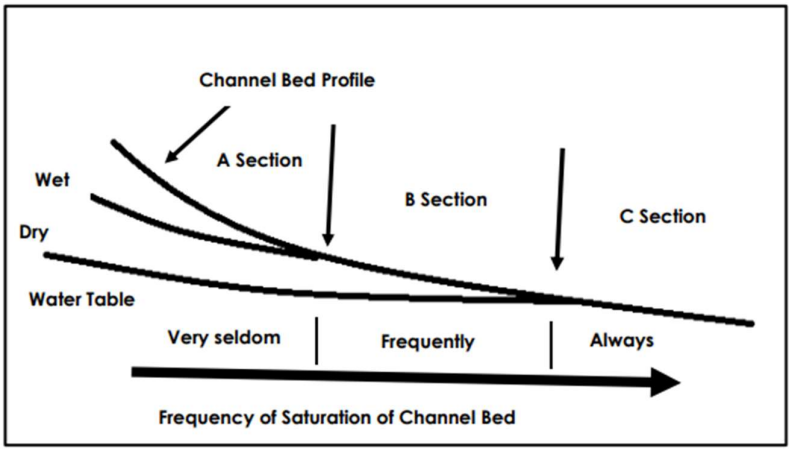


Figure 3-11 The watercourse classifications (DWAF, 2005)

3.3 Risk Screening

Table 3-4 provides the results of risk screening for the delineated wetlands and provides motivation for each of the determined categories.

Table 3-4 Risk status of the delineated wetlands

HGM unit	Risk Status	Rationale
HGM 1 HGM 2	At Risk	These HGM units were in proximity of or were downslope of the proposed activities and have therefore been determined as "at Risk".

		It is anticipated that direct and indirect impacts to the wetland systems are potential.
HGM 3 HGM 4 Non-Perennial Drainage Line	Not at Risk	These HGM units were not in proximity of or were upslope of the proposed activities and have therefore been determined as "Not at Risk". It is anticipated that no impacts to the wetland systems are potential.

3.4 Wetland Functional and Ecological Assessment

3.4.1 Functional Assessment

Only natural wetland features that were deemed to be "at Risk" (HGM 1 and HGM 2) were assessed further in terms of their ecological features.

3.4.1.1 General Functional Description

Unchannelled valley bottom wetlands (HGM1) are characterised by their location in valley bottoms without a distinct stream channel, resulting in diffuse water flow across the wetland. These wetlands are highly effective in sediment trapping due to their gentle gradients and the extensive areas that remain permanently saturated, which promote the deposition of sediments carried by runoff waters. The high levels of soil organic matter in these wetlands enhance their capacity for nitrate and toxicant removal, as the prolonged contact with runoff waters facilitates these processes. However, phosphate retention may be lower compared to other wetland types due to potential remobilisation under prolonged anaerobic conditions. Unchannelled valley bottom wetlands also contribute to streamflow regulation to some extent, although this is influenced by factors such as vegetation transpiration and soil characteristics. These wetlands play a crucial role in maintaining water quality and providing habitat for diverse species, making them vital components of the landscape (Kotze *et al.,* 2009).

Hillslope seep wetlands (HGM 2) are typically found on hillsides where water emerges from subsurface flows, creating a diffuse downslope movement. These wetlands are primarily fed by groundwater discharges, although surface water contributions can also supplement flows. Hillslope seeps are particularly effective in water quality enhancement, notably in the removal of excess nutrients and pollutants such as nitrates, through processes like denitrification. This is facilitated by the wetland's vegetation, which provides organic carbon necessary for microbial processes that assimilate these nutrients. The vegetation also plays a critical role in stabilising the soil, thereby reducing erosion risks, although the generally steep slopes of hillslope seeps can increase erosion susceptibility if vegetation cover is compromised. Additionally, these wetlands contribute to streamflow regulation by slowing down subsurface water movement, which prolongs water contribution to stream systems during low flow periods, although their flood attenuation capacity is limited once the soils are saturated (Kotze *et al.,* 2009).

It should be noted that these characteristics are representative of ideal river or wetland features and may not necessarily represent the characteristics of all rivers or wetlands. The functionality of the features and the provision of benefits is largely dependent on the river or wetland size and influence from abiotic drivers.

3.4.1.2 Ecosystem Services

The ecosystem services provided by the relevant HGM units on site were assessed and rated using the WET-EcoServices method (Kotze *et al.,* 2009). The ecosystem services scores of the delineated wetlands ranges from "Intermediate" to "Moderately Low". The main ecosystem services provided by the wetlands relate to flood attenuation, streamflow regulation, water quality enhancement, biodiversity maintenance, and regulating and provisioning benefits. The seep supports limited ecosystem functioning, due to its reduced sized and historical impact to the wetland largely from land transformation, nonetheless, the seep mainly supports improved water quality through the removal of excess nutrients and toxicants, as well as biodiversity maintenance.

3.4.2 Present Ecological State

The wetlands identified within the proposed Project Area have exhibited some degree of modification resulting from natural physical changes as well as anthropogenically induced impacts at both the local and catchment level. Resultingly, the wetlands scored average Present Ecological State (PES) scores within the "D – Largely Modified" and "E – Seriously Modified" PES classes. The results of the wetland health and integrity assessment is provided in Table 3-5.

Table 3-5 Average Present Ecological State scores for the assessed wetlands

Unit	Present Ecological State (PES) Assessment	Hydrology	Geomorphology	Water Quality	Vegetation
HGM 1	Ecological Category	E	D	D	C
	Combined Ecological Category	D – Largely Modified			
HGM 2	Ecological Category	E	E	D	E
	Combined Ecological Category	E – Seriously Modified			

The list below refers to the present-day local impacts observed within the assessed wetland areas:

- Alterations to hydrology and geomorphology through the development of roads and crossings within the wetland catchment;
- Water quality impairments from agricultural runoff and contaminated runoff from the catchment;
- Proliferation of alien invasive vegetation; and
- Erosion of watercourses from altered hydrology and geomorphology.

3.4.3 Ecological Importance and Sensitivity

The Ecological Importance and Sensitivity (EIS) assessment was applied to the HGM units in conjunction with the ecosystem service scores in the preceding sections, to assess the levels of sensitivity and ecological importance of the wetland. Various components pertaining to the protection status of a wetland is considered for the EIS, including Strategic Water Source Areas (SWSA), the NFEPA Wetland Vegetation Group protection status and the protection status of the wetland itself considering the National Biodiversity Assessment (NBA) wetland dataset. The results of the assessment are shown in Table 3-6. The wetlands average EIS scores present within the "B - High" and "C - Moderate" classes.

Table 3-6 Aspects considered in the Ecological Importance and Sensitivity assessment

HGM No.	National Freshwater Priority Area Wetland Vegetation Group			Wetland Condition (Field Survey)	National Biodiversity Assessment Wetlands		Strategic Water Source Areas (Y/N)	Critical Bio-diversity Area / Ecological Support Area (Y/N)	Ecological Importance and Sensitivity Class
	Type	Ecosystem Threat Status	Ecosystem Protection Level		Ecosystem Threat Status 2018	Ecosystem Protection Level			
HGM 1- Unchannelled Valley Bottom	Mesic Highveld Grassland Group 7	Critically Endangered	Not Protected	C – Moderately Modified	Critically Endangered	Not Protected	N	Y (ESA)	B - High
HGM 2 - Seep		Least Concern	Not Protected	D/E/F – Largely/ Seriously/ Critically Modified	Critically Endangered	Poorly Protected		N	C - Moderate

3.4.4 Recommended Ecological Category and Recommended Management Objective

The Recommended Ecological Category (REC) and Recommended Management Objective (RMO) for the wetland areas was determined from the results of the PES and EIS assessments. These assessments indicated that all wetland features within the site, had to an extent, underwent transformation as a result of historical and current impacts. Nevertheless, despite the altered ecological integrity of these systems, they are considered to provide ecological services. The appropriate REC and RMO estimated for the wetland areas is presented in Table 3-7 below.

Table 3-7 Summary of the Recommended Ecological Category and Recommended Management Objective categories assigned to the relevant wetlands

Hydrogeomorphic (HGM) Unit	Recommended Ecological Category (REC)	Recommended Management Objective (RMO)
HGM 1	C/D	Improve
HGM 2	E/F	Maintain

3.5 Buffer Requirements

The buffer requirements for the wetlands were calculated using the Site-Based Tool: Determination of buffer zone requirements for wetland ecosystems (Macfarlane *et al.,* 2014). The prescribed buffer zones are presented in Table 3-8 and Figure 3-12. The post-mitigation buffers for the wetlands and non-perennial drainage feature in relation to the proposed Project Area were calculated to be 20 m and 15 m, respectively. Provided that all recommended mitigation measures are implemented, these buffers are considered sufficient to maintain the resilience and ecosystem services of the identified watercourses.

The buffers are avoided by the proposed infrastructure, except for the EGI which intersects HGM 1 in the vicinity of an existing road crossing, which is regarded as acceptable.

Table 3-8 Buffer requirements for the relevant wetland features

Aspect	Post-Mitigation Buffer
Wetlands	20 m
Non-Perennial Drainage	15 m

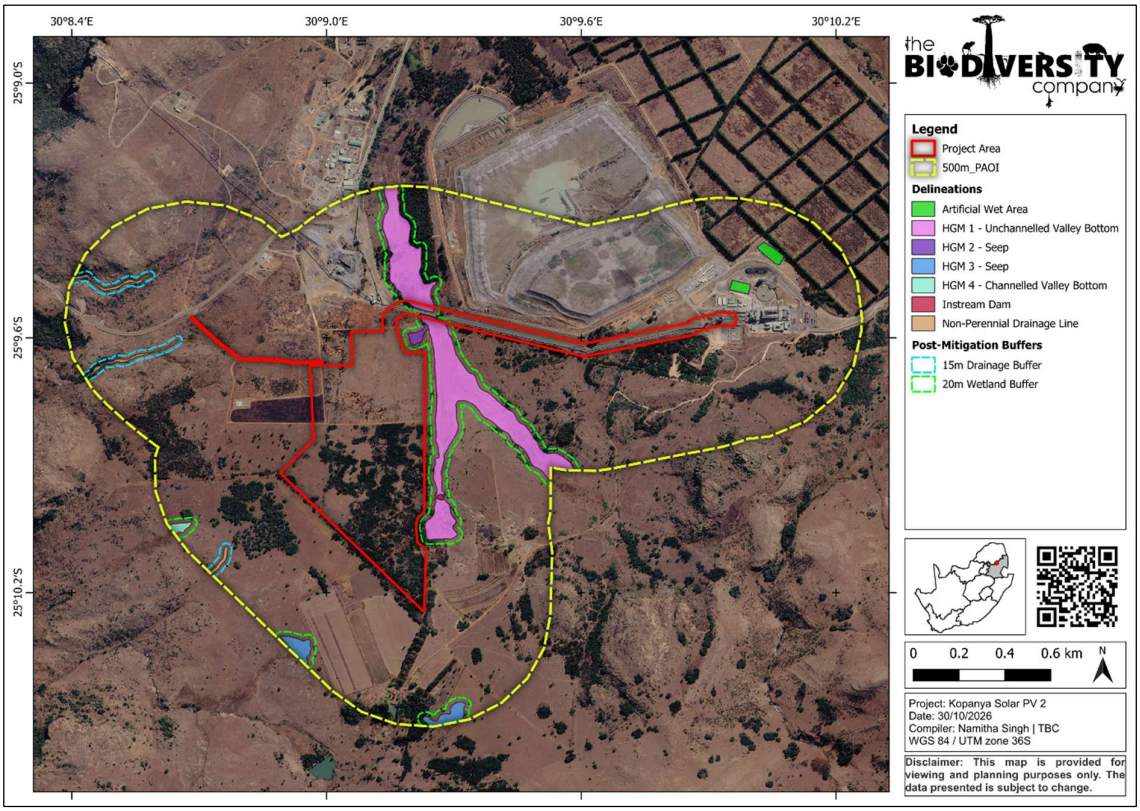


Figure 3-12 Post-mitigation buffer zones for the identified watercourses in relation to the proposed Project

3.6 Regulation Zones

Table 3-9 presents the legislated zones of regulation that would be applicable to the wetland areas.

In accordance with GN 4167 of 2023 and GN 509 of 2016, as it relates to the NWA, water uses as defined in Section 21 (c) & 21 (i) of the NWA must be considered if the proposed activities fall within the regulated zones of a watercourse as defined in the Act.

Listed activities in terms of the EIA Regulations, 2014 (GNR 326 in *GG* 40772 of 7 April 2017) as amended must be taken into consideration if any infrastructure is to be placed within the applicable zone of regulation.

Both types of authorisations (NEMA and NWA) are applicable given that the proposed Project occurs within the relevant regulated zones of the identified watercourses (Figure 3-13).

Table 3-9 Legislated zones of regulation

Regulatory authorisation required	Zone of applicability
Water Use Licence Application in terms of the National Water Act, 1998 (Act No. 36 of 1998) (NWA). Government Notice (GN) 4167 as published in the Government Gazette 49833 of 2023. GN 509 as published in the Government Gazette 40229 of 2016.	In accordance with GN 4167 of 2023 and GN 509 of 2016, as it relates to the NWA, a regulated area of a watercourse in terms of water uses as listed in Section **21c** & **21i** is defined as: • the outer edge of the 1 in 100 year flood line and/or delineated riparian habitat, whichever is the greatest distance, measured from the middle of the watercourse of a river, spring, natural channel, lake or dam; • in the absence of a determined 1 in 100 year flood line or riparian area the area within 100 m from the edge of a watercourse where the edge of the watercourse is the first identifiable annual bank fill flood bench; or • a 500 m radius from the delineated boundary (extent) of any wetland or pan in terms of this regulation.

Environmental Authorisation in terms of the Listed activities of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) EIA Regulations, 2014 (GNR 326 in GG 40772 of 7 April 2017)	Activity 12 of Listing Notice 1 (GN 327) of the EIA Regulations, 2014 (as amended) states that: "The development of: (xii) Infrastructure or structures with a physical footprint of 100 square metres or more; Where such development occurs— Within a watercourse; In front of a development setback; or If no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse." Activity 19 of Listing Notice 1 (GN 327) of the EIA Regulations, 2014 (as amended) states that: "The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse."

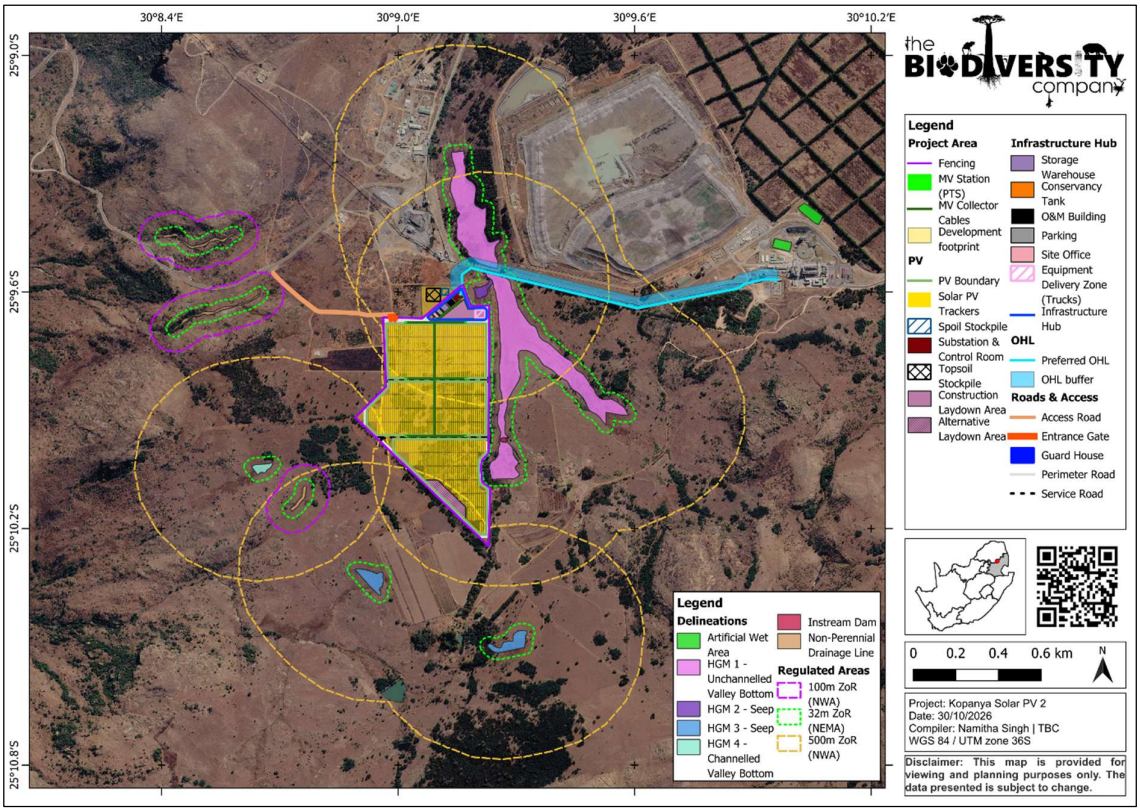


Figure 3-13 Zones of regulation in relation to the identified watercourses within the proposed Project Area of Influence

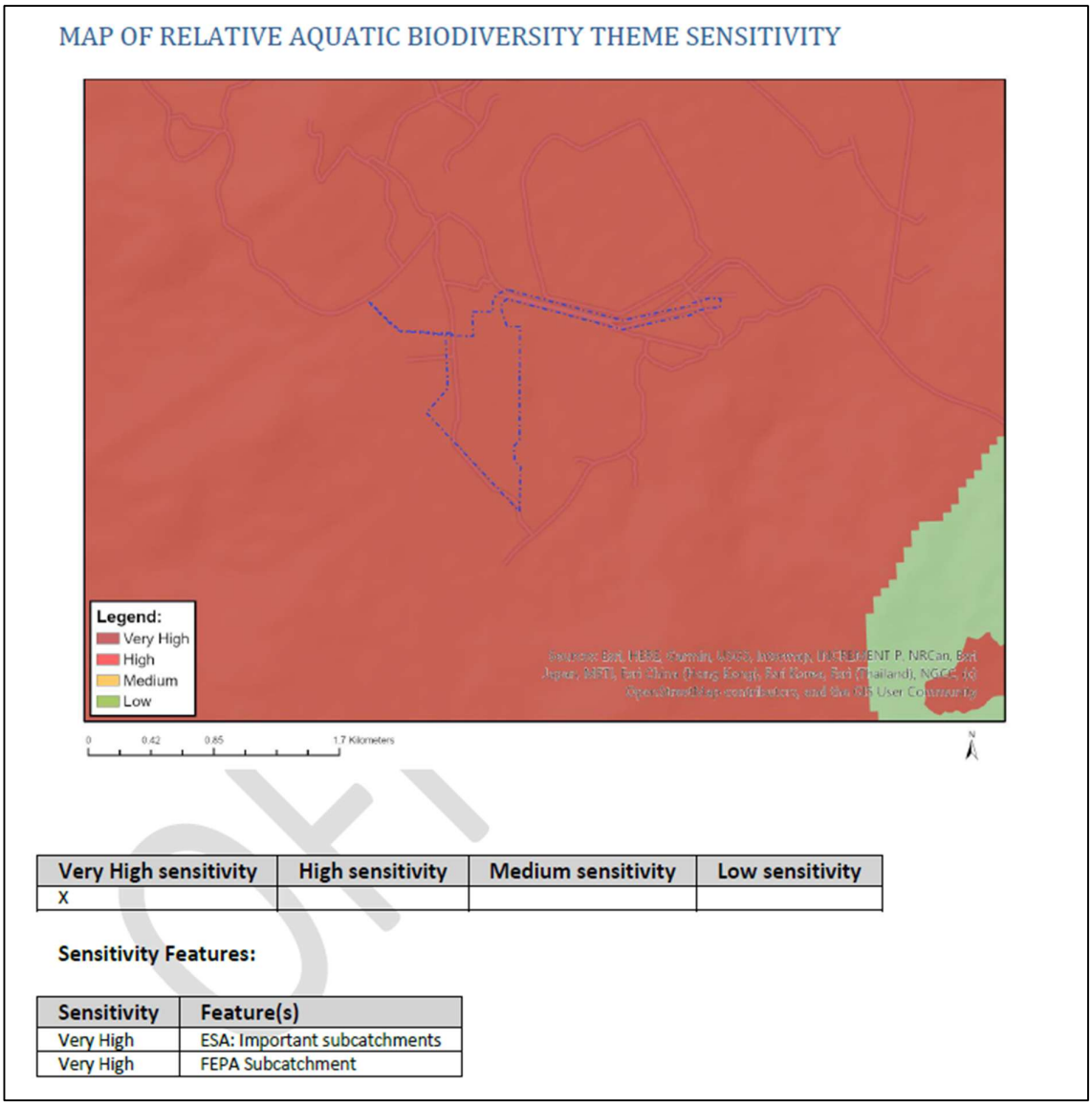
3.7 Site Sensitivity Verification

3.7.1 Desktop Ecological Sensitivity

The following is deduced from the National Web-Based Environmental Screening Tool (Regulation 16(1)(v) of the EIA Regulations 2014, (GNR 326 in *GG* 40772 of 7 April 2017):

- Aquatic Biodiversity Theme sensitivity as "Very High" sensitivity for the entire proposed Project Area attributed to the presence of:
    - ESA: Important subcatchments;
    - ESA: Wetlands;
    - Wetlands – Valley bottom wetland; and

- Freshwater Ecosystem Priority Areas (FEPA) Subcatchments (Figure 3-14).



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Very High	ESA: Important subcatchments
Very High	FEPA Subcatchment

Figure 3-14 Aquatic Biodiversity Theme Sensitivity for the proposed Project Area

3.7.2 Screening Tool Comparison

The allocated sensitivities for each of the relevant themes are either disputed or validated for the assessed areas in Table 3-10 below. A summative explanation for each result is provided as relevant. The specialist assigned sensitivity ratings are based on the presence or absence of wetlands and the nature of features and the PES and EIS assessment processes followed in the previous section. Furthermore, consideration is given to any observed or likely presence of sensitive fauna and flora. The sensitivities are displayed in Figure 3-15.

Table 3-10 Summary of the screening tool vs specialist assigned sensitivities

Aspect	Screening Tool Theme	Screening Tool	Specialist Finding	Tool Validated or Disputed by Specialist - Reasoning
Unchannelled & Channelled valley bottoms (HGM 1 & 4)		**Very High**	**High**	Disputed – The valley bottom wetlands presented with surface water along some reaches of the wetlands, and hydrophilic vegetation, supporting multiple ecological functions. Additionally, the valley bottom wetlands have hydrological connection to the surrounding watercourses, supporting overall ecosystem functioning.
Seep Wetlands (HGM 2 & 3)		**Very High**	**Medium**	Disputed – The seep wetlands exhibit some degree of modification to the wetlands; however, the wetlands still support ecological functioning.
Non-Perennial Drainage Lines		**Very High**	**Medium**	Disputed – The non-perennial drainage mainly supports water movement towards larger watercourses. Additionally, the drainage feature provides suitable habitat for the surrounding local fauna and contributes to the hydrological connectivity between the surrounding watercourses.
Watercourse Buffers		**Very High**	**Medium**	Disputed – Whilst the buffer areas do not necessarily represent freshwater features, their conservation is imperative to limiting impact to the wetlands as they form the periphery of the wetlands thereby having spatial connectivity to the wetlands. The sensitivity of the buffers is therefore determined by the landscape and the sensitivity of the features they encompass.
Artificial Wet Areas		**Very High**	**Low**	Disputed – These artificial features do not contribute to the natural hydrological regime of the landscape, nor do they support ecological functioning.
Remaining Area		**Very High**	**Low**	Disputed – These areas lack typical wetland indicators and are therefore not representative of natural wetlands or related aquatic environments.

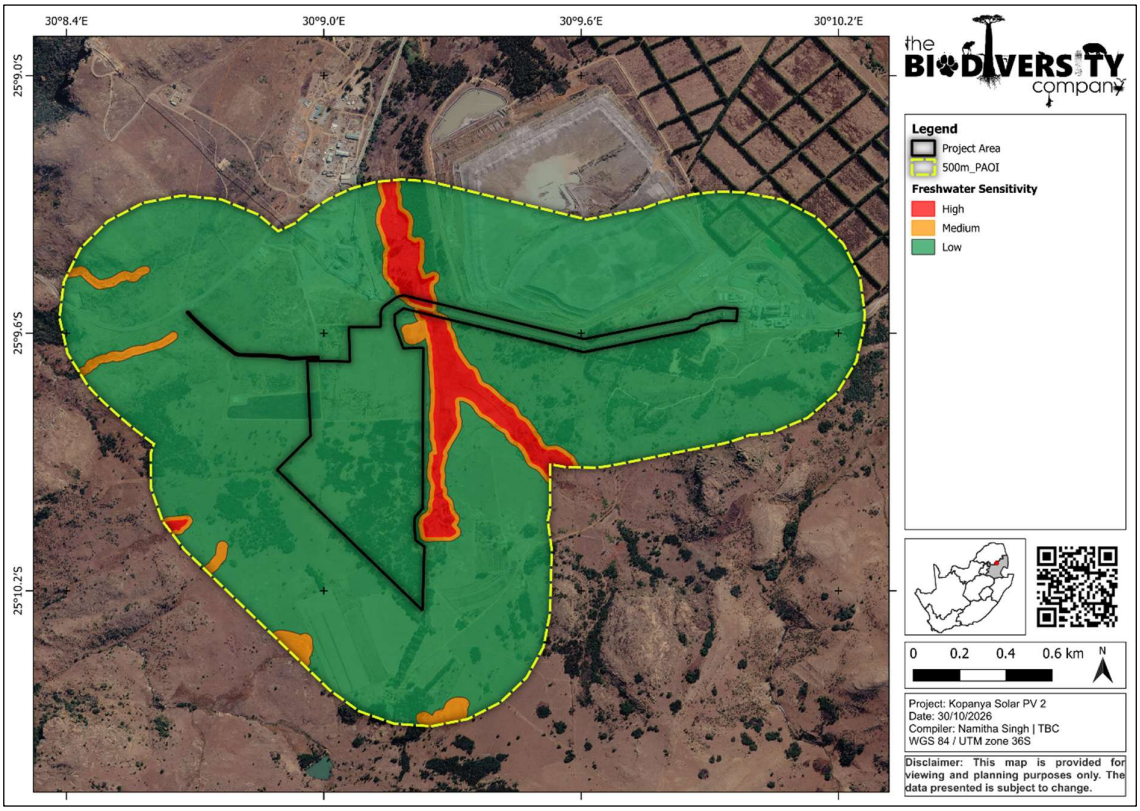


Figure 3-15 Freshwater Sensitivity for the proposed Project Area of Influence

4 Risk and Impact Assessment

The Risk Assessment Matrix (RAM) considered the indirect impacts, to the wetland systems. The mitigation hierarchy as discussed by the Department of Environmental Affairs (2013) will be considered for this component of the assessment (Figure 4-1). In accordance with the mitigation hierarchy, the preferred mitigatory measure is to avoid impacts by considering options in project location, siting, scale, layout, technology and phasing to avoid impacts.

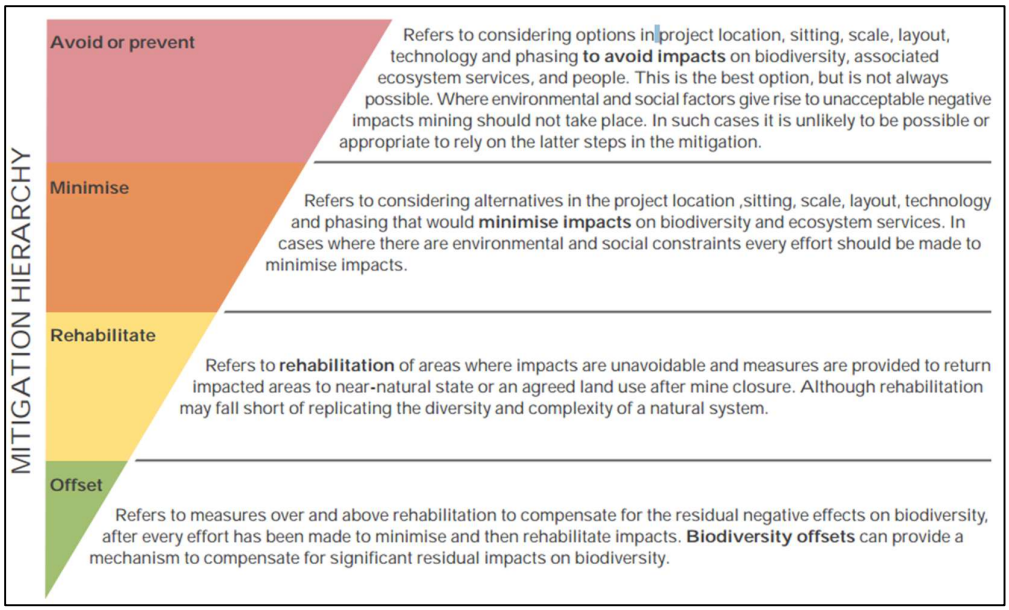


Figure 4-1 The mitigation hierarchy as described by the Department of Environmental Affairs (2013)

The RAM for the proposed Project (Table 4-1) under the assumption that the wetlands and their prescribed buffers will be avoided by the proposed Project layout. The intersection of HGM 1 by the proposed EGI is considered acceptable as the powerline route has been aligned to an existing road to minimise disturbance and potential impacts.

It is anticipated that the proposed Project will pose an overall “Low” post-mitigation risk status.

During construction, activities such as vegetation clearance, earthworks, road establishment, blasting and infrastructure installation could disturb soil and vegetation, increase erosion and sediment delivery, alter runoff patterns, and affect water quality through accidental spills or leaks. These impacts could affect HGM 1 and HGM 2. However, the RAM assigns “Low” significance to all construction-phase impacts.

During operation, potential impacts relate to runoff from roads and hardened surfaces, erosion and sediment mobilisation, water-quality impairment from cleaning products or wastewater failures, and the spread of alien invasive plants. Routine road, fence and electrical-connection maintenance may also cause localised disturbance. The potentially affected watercourses are HGM 1 and HGM 2. All operational impacts are rated “Low” in the RAM.

Decommissioning activities, including dismantling infrastructure, waste management and relandscaping, could disturb soil and vegetation, alter runoff, increase erosion and sedimentation, and create a risk of water-quality impairment from discarded materials or contaminated runoff. These potential impacts may affect HGM 1 and HGM 2. The RAM rates all decommissioning impacts as “Low”.

The proposed PV development may contribute cumulatively to sedimentation, altered runoff, erosion, vegetation loss and water-quality pressures when considered alongside other activities in the surrounding catchment. However, because the identified watercourses are avoided, direct disturbance is not anticipated, and the likelihood of indirect effects is reduced. Provided buffers are maintained and the recommended erosion, stormwater, spill-prevention and rehabilitation measures are implemented effectively, the cumulative impact on watercourses is considered Low. This rating should be confirmed against other existing and planned developments and pressures in the catchment.

Table 4-1 Summative results of the Risk Assessment conducted for the proposed Project

Phase	Activity	Impact	Potentially affected watercourses Name/s	Significance (max = 100)	Risk Rating
CONSTRUCTION	**Solar Facility and Associated Infrastructure Complex** Site clearing and preparation Earthworks and vehicle movement Temporary and portable ablutions Civil works Transportation and installation of PV panels Wiring to central inverters Establishment of access roads and tracks for machinery Storage and use of hazardous substances and equipment	Increased sedimentation and turbidity in wetlands from soil disturbance and runoff	HGM 1	**21.6**	**L**
			HGM 2	**16.2**	**L**
		Loss of native vegetation and habitat fragmentation with proliferation of alien species from vegetation clearance	HGM 1	**21.6**	**L**
			HGM 2	**16.2**	**L**
		Impaired water quality from contaminated runoff (accidental chemical and oil spills from machinery and equipment used for clearance activities and leaks from temporary ablutions)	HGM 1	**14.4**	**L**
			HGM 2	**10.8**	**L**
	Conservancy Tank Establishing and demarcating the tank footprint and temporary work area Clearing vegetation and stripping topsoil Excavating and preparing the tank foundation Installing the tank, pipework and connections Managing construction materials, wastewater and spoil Backfilling, compacting and rehabilitating disturbed areas	Soil disturbance and compaction within the catchment, potentially increasing runoff and sediment delivery to downstream wetlands or watercourses.	HGM 1	**11.2**	**L**
			HGM 2	**8.4**	**L**
		Erosion and sedimentation from exposed soil or stockpiles, which may affect water quality and wetland condition downstream.	HGM 1	**11.2**	**L**
			HGM 2	**8.4**	**L**
		Potential contamination of catchment runoff from fuel, oil, cement, sewage or other construction-related spills or leaks.	HGM 1	**11.2**	**L**
			HGM 2	**8.4**	**L**
	Perimeter Roads, Fences and Internal Roads Surveying, setting out and demarcating the working areas Clearing vegetation and stripping topsoil Excavating, grading and filling the road formation Installing drainage controls, where required Placing and compacting road material Managing spoil and rehabilitating temporary work areas	Changes to catchment runoff and drainage patterns due to road embankments, compacted surfaces or drainage structures, potentially altering flows to downstream wetlands.	HGM 1	**16.8**	**L**
			HGM 2	**12.6**	**L**
		Erosion and sediment mobilisation from cleared and exposed areas, with potential downstream sedimentation.	HGM 1	**16.8**	**L**
			HGM 2	**12.6**	**L**
		Pollution of runoff from construction materials, vehicle leaks, fuels or oils, potentially affecting receiving wetlands or watercourses.	HGM 1	**11.2**	**L**
			HGM 2	**8.4**	**L**
	Access Road Surveying, setting out and demarcating the road route and working area Clearing vegetation and stripping topsoil Excavating, grading and filling the road formation	Changes to catchment runoff and drainage patterns due to road embankments, compacted surfaces or drainage structures, potentially altering flows to downstream wetlands.	HGM 1	**4**	**L**
			HGM 2	**12.6**	**L**
		Erosion and sediment mobilisation from cleared and exposed areas,	HGM 1	**4**	**L**

	Installing drainage controls, where required Placing and compacting road material Managing spoil and rehabilitating temporary work areas	with potential downstream sedimentation.	HGM 2	**12.6**	**L**
		Pollution of runoff from construction materials, vehicle leaks, fuels or oils, potentially affecting receiving wetlands or watercourses.	HGM 1	**4**	**L**
			HGM 2	**8.4**	**L**
	Blasting (for cable trenches and building footings) Marking and securing the blasting area Drilling blast holes and preparing charges Conducting controlled blasting Removing and managing blasted rock and spoil Excavating and preparing trenches or footing areas Backfilling, reinstating and rehabilitating disturbed ground	Ground disturbance and exposed soil or spoil may increase erosion and sediment transport through the catchment to downstream wetlands or watercourses.	HGM 1	**16.8**	**L**
			HGM 2	**12.6**	**L**
		Dust, noise and vibration may temporarily disturb terrestrial fauna and nearby receptors.	HGM 1	**11.2**	**L**
			HGM 2	**8.4**	**L**
		Potential changes to local runoff or contamination of runoff from disturbed ground, blasting residues, fuels or equipment, with possible indirect effects on downstream water quality.	HGM 1	**28**	**L**
			HGM 2	**21**	**L**
	Electrical Grid Connection Site preparation Excavation and earthworks (for pylon foundations) Transportation and installation of Infrastructure Movement of heavy machinery within and around the wetland	Induced erosion and sedimentation from soil compaction and vegetation clearance	HGM 1	**28.8**	**L**
			HGM 2	**3**	**L**
		Loss of native vegetation and habitat fragmentation with proliferation of alien species from vegetation clearance	HGM 1	**28.8**	**L**
			HGM 2	**3**	**L**
		Impaired water quality from accidental chemical and oil spills from machinery and equipment used in the installation process	HGM 1	**21.6**	**L**
			HGM 2	**3**	**L**
OPERATIONAL	**Solar Facility** Stormwater management Maintenance including washing panels Road network	Water quality impairment from cleaning chemicals and contaminated runoff	HGM 1	**26.4**	**L**
			HGM 2	**19.8**	**L**
		Continued proliferation of alien invasive vegetation	HGM 1	**14.4**	**L**
			HGM 2	**10.8**	**L**
		Altered overland flows from hardened surfaces and induced erosion and sedimentation of watercourses	HGM 1	**26.4**	**L**
			HGM 2	**19.8**	**L**
	Conservancy Tank Collecting and conveying wastewater to the tank Routine inspection of the tank, pipework, connections and alarms Monitoring tank levels and arranging timely pump-out or removal of wastewater Maintaining the tank and associated equipment Responding to leaks,	Contamination of soil and catchment runoff if wastewater leaks, the tank overflows, or pipework and connections fail, with potential indirect effects on downstream wetlands or watercourses.	HGM 1	**14.4**	**L**
			HGM 2	**10.8**	**L**
		Disturbance from pump-out and maintenance activities, including vehicle movement, noise and the risk of accidental spills during wastewater handling and transport.	HGM 1	**11.2**	**L**
			HGM 2	**8.4**	**L**

	overflows, blockages or other failures Transporting and disposing of wastewater at an authorised facility Keeping records of inspections, pump-outs and maintenance				
	Access Road, Perimeter Roads and Internal Roads Using roads for routine access, inspections, maintenance and security patrols Maintaining road surfaces, including grading, repairing potholes and replenishing road material where needed Inspecting and maintaining road drainage, culverts and erosion controls Managing dust through appropriate measures, where required Removing litter, debris and obstructions from roads and drainage structures Managing vehicle movements and access to the site	Altered runoff and drainage patterns from compacted road surfaces and drainage infrastructure, potentially changing the quantity or timing of runoff reaching downstream wetlands or watercourses.	HGM 1	**26.4**	**L**
			HGM 2	**19.8**	**L**
		Erosion and sediment mobilisation from road surfaces, verges and drainage outlets, potentially affecting downstream water quality and habitat.	HGM 1	**17.6**	**L**
			HGM 2	**13.2**	**L**
		Dust, vehicle disturbance and wildlife mortality risk associated with routine traffic and road maintenance, particularly where vehicles travel at inappropriate speeds or dust controls are inadequate.	HGM 1	**5.6**	**L**
			HGM 2	**4.2**	**L**
	Fences Maintaining fences and gates, including repairs and clearing vegetation where necessary	Localised vegetation disturbance and soil exposure from fence inspections, repairs and vegetation clearing, potentially increasing erosion and sediment runoff into the catchment.	HGM 1	**5.6**	**L**
			HGM 2	**4.2**	**L**
	Electrical Grid Connection Routine maintenance using powerline servitude	Altered overland flows from existing hardened surfaces (roads) within the servitude and induced erosion and sedimentation of watercourses	HGM 1	**26.4**	**L**
			HGM 2	**10.8**	**L**
		Continued proliferation of alien invasive vegetation	HGM 1	**26.4**	**L**
			HGM 2	**10.8**	**L**
DECOMMISSIONING	**Removal of Solar Facility, Including all Associated Infrastructure and Electrical Grid Connection Infrastructure** Dismantlement and deconstruction of structure Relandscaping Waste Management Stormwater Management	Altered hydrology and induced erosion and sedimentation from disturbed soil and denuded areas	HGM 1	**21.6**	**L**
			HGM 2	**16.2**	**L**
		Loss of native vegetation from vegetation disturbance and the proliferation of alien vegetation	HGM 1	**21.6**	**L**
			HGM 2	**16.2**	**L**
		Impaired water quality from contaminated runoff from discarded infrastructure and the removal of materials	HGM 1	**21.6**	**L**
			HGM 2	**16.2**	**L**

5 Mitigation Measures

In light of the expected impacts from proposed activities the following mitigation measures have been proposed to lower the intensity of the impacts on the ecological integrity of the wetland catchment and its downslope wetland features.

The focus of mitigation measures should be to reduce the significance of potential environmental impacts associated with the mixed land use development and thereby to:

- Prevent the unnecessary destruction of, and fragmentation, of the vegetation community of the wetland areas; and
- Limit the construction area to the defined Project Areas and only impact those areas where it is unavoidable to do so otherwise.

Table 5-1 Recommended mitigation measures for the proposed Project

Phase	Activity	Potential environmental impacts	Mitigation measures
Construction	Solar facility and associated infrastructure site preparation and construction: site clearing and preparation, earthworks and vehicle movement, temporary ablutions, civil works, PV panel transportation and installation, wiring to central inverters, and hazardous-substance storage and use.	Soil disturbance and compaction, erosion and sediment mobilisation; loss of native vegetation and habitat disturbance; alien invasive plant establishment; contaminated runoff from spills, leaks or wastewater.	• Demarcate the approved construction footprint and applicable wetland and drainage-feature buffers before work starts. Do not clear, store materials or undertake earthworks outside approved areas. • Minimise vegetation clearance and soil disturbance; retain indigenous vegetation wherever practicable and keep vehicles on designated routes. • Stage earthworks to limit the area of exposed soil at any one time. Stabilise exposed ground promptly and rehabilitate disturbed areas progressively with suitable indigenous vegetation. • Install and maintain appropriate stormwater, erosion and sediment controls, such as clean-water diversions, berms, silt fences and sediment traps, where suitable to site conditions. • Place stockpiles on stable ground outside buffers and drainage pathways; protect them from wind and rain-wash. • Inspect work areas and erosion controls during construction and after rainfall; promptly repair erosion, damage or sediment-control failures. • Store fuels, oils and chemicals in secure, bunded areas away from drainage pathways and sensitive features. Refuel and maintain machinery only in designated areas. • Inspect machinery and temporary ablutions regularly for leaks or overflows. Service ablutions often enough to prevent leakage and remove wastewater through an appropriate service provider. • Keep spill kits available, train personnel in spill response, and immediately contain and clean up spills. Remove contaminated soil and waste for appropriate disposal. • Monitor disturbed areas for alien invasive plants and remove them promptly using suitable methods; avoid herbicide use near watercourses and buffers unless specifically approved.
	Roads and tracks: access road, perimeter roads, internal roads, associated earthworks and drainage installation.	Altered runoff and drainage patterns; erosion and sediment mobilisation from road surfaces, verges, stockpiles and outlets; contaminated runoff from fuels, oils, materials or vehicle leaks.	• Confirm road alignments and drainage outlets against mapped wetlands, watercourses and applicable buffers before construction; avoid sensitive areas where practicable. • Keep road construction within the approved footprint and minimise vegetation clearance and unnecessary vehicle movement. • Design road drainage to maintain natural drainage patterns as far as practicable. Avoid concentrating runoff towards wetlands, watercourses or unstable ground. • Stabilise drainage outlets and road batters to prevent scour and channel formation. Inspect culverts and drainage structures during construction and after rainfall; clear blockages and repair erosion promptly. • Use appropriate erosion and sediment controls at active

			earthworks, exposed verges and drainage outlets. Stabilise exposed soils and rehabilitate temporary work areas as soon as practicable. • Keep topsoil, spoil and road-material stockpiles stable, protected from wash-off, and outside buffers and drainage pathways. • Store and handle fuels, oils and other hazardous substances in secure, bunded areas. Refuel and maintain machinery in designated areas away from drainage pathways. • Inspect vehicles and machinery for leaks, keep spill kits available and clean up spills immediately. • Treat any proposed watercourse crossing as a separate activity: confirm the design, required approvals and site-specific controls before work begins.
	Conservancy tank installation: demarcation, vegetation clearance, excavation, tank and pipework installation, material and spoil management, backfilling and reinstatement.	Soil disturbance, compaction, erosion and sedimentation; contamination of soil or catchment runoff from wastewater, fuel, oil, cement or other spills and leaks.	• Locate the tank and associated work area outside applicable buffers and away from drainage pathways or areas prone to ponding, where practicable. • Demarcate the work area and restrict machinery to designated routes. Minimise the excavation footprint and duration. • Separate topsoil from subsoil and excavated material; place stockpiles on stable ground outside buffers and drainage pathways, and protect them from rain-wash. • Control runoff around the excavation and use suitable sediment controls to prevent sediment leaving the work area. • Keep wastewater contained during installation and testing; do not discharge it to ground or stormwater. Install the tank, pipework and connections to design specifications, inspect joints and test for leaks before commissioning. • Store fuels, oils, chemicals and cement securely with secondary containment. Keep spill kits available and train workers in spill response. • Inspect temporary sanitation facilities regularly and arrange servicing to prevent leaks or overflows. • Backfill and reinstate disturbed ground promptly, stabilise exposed soil and monitor for erosion until the area is stable.
	Blasting and associated trench or footing works: blast-area demarcation, drilling and controlled blasting, spoil removal, excavation, backfilling and rehabilitation.	Erosion and sediment transport from exposed ground and spoil; dust, noise, vibration and flyrock; runoff contamination from fuels, equipment or blast-related residues.	• Use a competent, appropriately authorised blasting contractor and an approved blast plan. • Demarcate and secure the blast area, establish suitable exclusion zones and give warnings before each blast. Comply with applicable safety and notification requirements. • Use controlled blasting methods to minimise vibration, noise, dust and flyrock; record blasts, incidents and complaints and respond to concerns. • Keep fuels, explosives, equipment and blast-related materials in designated, secure areas away from drainage pathways and buffers. • Keep spoil and blasted rock in stable, designated locations outside buffers and drainage pathways; protect stockpiles from runoff and wind dispersion. • Apply erosion and sediment controls to exposed ground and spoil. Stabilise or reinstate disturbed areas promptly and inspect for sediment movement after rainfall. • Prevent blast residues, drilling fluids, fuel or waste from entering stormwater drains or the surrounding catchment. Contain and clean up spills immediately and dispose of contaminated material appropriately.
	Electrical grid connection: site preparation, excavation and earthworks for foundations, infrastructure transport and installation, and associated machinery movement.	Soil disturbance, compaction, erosion and sedimentation; native vegetation loss and alien invasive plant establishment; contaminated runoff from machinery or hazardous substances.	• Confirm the alignment and foundation locations against mapped wetlands, drainage features and applicable buffers; avoid sensitive areas and minimise the work footprint where practicable. • Demarcate work areas and access routes. Restrict machinery to designated routes and use lower-ground-pressure equipment where practicable. • Minimise vegetation clearance and retain indigenous vegetation where possible. Rehabilitate disturbed areas with suitable indigenous species. • Keep excavated material and stockpiles stable and away from buffers and drainage pathways. Install appropriate sediment

			controls and stabilise exposed ground promptly. • Store fuels, oils and chemicals securely with secondary containment; refuel and maintain machinery in designated areas away from drainage pathways. • Inspect machinery for leaks, keep spill kits available and ensure workers know spill-response procedures. Promptly contain and clean up spills and appropriately dispose of contaminated material. • Monitor rehabilitated areas for erosion and alien invasive plants, and undertake corrective action as needed. • Where work involves a watercourse crossing or buffer encroachment, confirm the design, required approvals and additional site-specific controls before construction.
Operation	Solar facility operation and maintenance: stormwater management, panel washing, maintenance of the facility and road network, and alien plant control.	Water-quality impacts from cleaning chemicals or contaminated runoff; altered runoff, erosion and sedimentation from hardened surfaces and drainage infrastructure; alien invasive plant establishment or spread.	• Maintain stormwater infrastructure and erosion-control measures so they function as designed; inspect them routinely and after heavy rainfall. • Direct runoff from roads and hardened surfaces to stable discharge areas. Prevent concentrated flows from causing scour or carrying sediment towards wetlands or watercourses. • Maintain suitable ground cover beneath and around panels where practicable to reduce erosion and support infiltration. • Use water and panel-cleaning products appropriate for the equipment; avoid hazardous products where practicable and store cleaning materials securely. • Prevent wash water containing chemicals or contaminants from entering stormwater drains or flowing uncontrolled towards wetlands and watercourses. • Inspect infrastructure for leaks, spills or contaminated runoff and address problems promptly. • Monitor disturbed and rehabilitated areas for alien invasive plants and remove them promptly using suitable methods. Avoid herbicide use near watercourses and buffers unless specifically approved.
	Conservancy tank operation and maintenance: wastewater collection and conveyance, inspections, level monitoring, pump-out, maintenance and response to failures.	Soil or runoff contamination from leaks, overflows or pipework failure; spills and disturbance during pump-out, maintenance and wastewater transport.	• Inspect the tank, pipework, connections and alarms regularly, maintain them according to specifications, and keep inspection and maintenance records. • Monitor tank levels and arrange pump-out before capacity is reached. Use an appropriate service provider and authorised disposal facility. • Supervise wastewater transfer and hose connections; keep spill-response materials available during pump-out. • Respond immediately to leaks, overflows or blockages. Contain any release, prevent runoff from leaving the area, and clean up and appropriately dispose of contaminated material. • Schedule pump-out and maintenance to minimise unnecessary vehicle movements; use designated access routes.
	Road network operation and maintenance: access road, perimeter roads and internal roads, including traffic, surface repairs and drainage maintenance.	Altered runoff and drainage patterns; erosion and sediment mobilisation from roads, verges and drainage outlets; dust, vehicle disturbance and wildlife collision risk.	• Maintain road drainage, culverts and erosion controls to prevent blockage, failure or unintended diversion of runoff. • Inspect roads, verges and drainage outlets routinely and after heavy rainfall. Repair potholes, ruts, scour and damaged controls promptly. • Manage grading and road-material replenishment to avoid pushing loose sediment into drainage pathways; dispose of removed sediment and debris in a stable, appropriate location. • Apply site speed limits and keep drivers on designated roads. Use dust suppression where needed while avoiding excessive water use or runoff. • Instruct drivers to report wildlife incidents and investigate recurring risks; implement additional controls if monitoring indicates a need.
	Fence inspection and maintenance: repairs to fences and gates, and necessary vegetation management.	Localised vegetation and soil disturbance, potentially increasing erosion and sediment runoff; potential wildlife entrapment or movement barriers.	• Limit clearing and repair work to the minimum area required; use existing access routes and avoid unnecessary disturbance of drainage pathways. • Collect and remove fencing materials and other waste after repairs. • Stabilise exposed soil and rehabilitate disturbed areas with suitable indigenous vegetation; monitor for erosion and alien invasive plants.

			• Inspect fences and gates for wildlife entanglement or injury and record incidents. Where recurring risks are identified, review fence design or maintenance practices, consistent with site security requirements.
	Electrical grid connection operation and maintenance: routine maintenance in the powerline servitude and use of associated access tracks.	Altered runoff, erosion and sedimentation from tracks and hardened surfaces; alien invasive plant establishment or spread.	• Maintain existing access tracks and drainage structures to prevent blockages, concentrated flows and erosion. Avoid creating or widening tracks unless necessary and appropriately assessed. • Inspect road edges, drainage outlets and the servitude for erosion and sediment movement; implement corrective measures promptly. • Reinstate areas disturbed during maintenance with suitable indigenous vegetation or other appropriate stabilisation. • Monitor the servitude and access tracks for alien invasive plants and remove them promptly using suitable methods.
Decommissioning	Decommissioning and rehabilitation of the solar facility, associated infrastructure and grid connection: dismantling, removal, waste management, relandscaping and stormwater management.	Soil disturbance, altered runoff, erosion and sedimentation; vegetation disturbance and alien invasive plant establishment; contaminated runoff from waste, residual substances or spills.	• Prepare and implement a decommissioning, erosion-control and rehabilitation plan before removal begins. • Demarcate work areas, maintain applicable buffers and avoid disturbance outside the approved footprint. • Phase removal to limit exposed soil; maintain or adapt stormwater and sediment controls throughout dismantling and relandscaping. • Segregate and remove dismantled infrastructure, hazardous substances and general waste. Do not leave materials where runoff could transport them. • Inspect equipment and components for oils, fuels or residues before removal; store hazardous substances securely with secondary containment. • Keep spill kits available, train personnel in spill response and immediately contain and clean up spills. Remove contaminated soil and materials for appropriate disposal. • Manage temporary sanitation facilities to prevent leaks or overflows, and remove them without discharging wastewater to the ground or drainage system. • Salvage and replace topsoil where practicable. Rehabilitate disturbed areas with suitable indigenous species and stabilise exposed ground promptly. • Monitor rehabilitation for erosion, sediment movement and alien invasive plants; undertake follow-up stabilisation, planting or weed control until the area is stable.

6 Conclusion

Four HGM units were identified within the PAOI, consisting of one unchannelled valley bottom wetland (HGM 1) containing an instream dam, two seep wetland systems (HGM 2 and 3) and one channelled valley bottom wetland (HGM 4). Additionally, three non-perennial drainage line was identified along the border of the PAOI, as well as artificial wet areas resulting from mining operations.

The non-perennial drainage feature is referred to as an 'A' Section channels that convey surface runoff immediately after a storm event and are not associated with a baseflow (DWAF, 2005). Only natural wetland features that were deemed to be "at Risk" were assessed further in terms of their ecological features.

The results for the assessed wetlands are in the table below:

Table 6-1 Result summary of the functional assessments for the assessed wetlands

Hydrogeomorphic (HGM) Unit	Present Ecological State (PES)	Ecosystem Service Score	Ecological Importance and Sensitivity (EIS)	Recommended Ecological Category (REC) Recommended Management Objective (RMO)
HGM 1	D – Largely Modified	Intermediate	High	C/D - Improve
HGM 2	E – Seriously Modified	Moderately Low	Moderate	E/F - Maintain

The prescribed post-mitigation buffers for the wetlands (HGM 1 and HGM 2) are 20 m with a 15 m buffer prescribed for the non-perennial drainage feature.

6.1 Risk Assessment

A Risk Assessment was conducted for the proposed Project. The post-mitigation risk presented within the "Low" significance category given adherence to the post-mitigation buffers and prescribed mitigation measures. The intersection of HGM 1 by the proposed EGI is considered acceptable as the powerline route has been aligned to an existing road to minimise disturbance.

6.2 Specialist Opinion

Considering the assessment findings and the assumption that the suggested mitigation measures will be implemented, no fatal flaws are evident for the proposed Project at this stage. It is the opinion of the specialists that the proposed Project may be favourably considered for authorisation.

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8 Appendix Items

8.1 Appendix A – Methodology

8.1.1 Desktop Dataset Assessment

The desktop assessment was undertaken using GIS to access, view and overlay the latest available related datasets with the Project Area. The information represented within the datasets was used to develop the relevant digital maps used to identify potentially environmentally sensitive areas. These datasets and their respective dates of publishing are provided below:

- Vegetation Types - Vegetation Map of South Africa, Lesotho and Swaziland (SANBI, 2018 & Mucina and Rutherford 2006);
- Soils and Geology - Land Types Database (Land Type Survey Staff, 1972 - 2006); and
- Topographical Inland Water Areas and River Lines (based on the 1994 1:500 000 topographic maps as per the Chief Directorate of the National Geo-spatial Information).

8.1.1.1 Vegetation Types - Vegetation Map of South Africa, Lesotho and Swaziland

The Vegetation Map of South Africa, Lesotho and Swaziland (SANBI, 2018) is the latest and updated version of the maps published in earlier time such as those presented by Mucina and Rutherford (2006) and those presented in the National Biodiversity Assessment (2011). The map provides spatial details on the representative vegetation of South Africa and is complemented in this report using information from Strelitzia (Mucina & Rutherford, 2006) to provide insight on the landscape features, biogeography, climate, geology, and soils of the Project Area.

8.1.1.2 Soils and Geology - Land Type Database

The Land Type Survey provides information on the soils, terrain, climate, and geology of areas within South Africa. The data includes the pedological classification of soils and is used in this report to provide insight on the common soil forms associated with aquatic or freshwater systems of a particular area.

8.1.1.3 Topographical River Lines and Inland Water Areas

Topographical Inland Water Areas and River Lines for South Africa are based on the topographic maps dated 1994 as per the National Geo-spatial Information. These datasets are used in this report to provide insight on potential wetland areas and serves to highlight the location and extent of drainage features, dams, wetlands, reservoirs and other relevant inland waterbodies.

8.1.1.4 Ecologically Important Landscape Features

The datasets listed below were incorporated to establish the relation between the project and ecologically important or sensitive freshwater entities. Emphasis was placed around the following spatial datasets:

- South African Inventory of Inland Aquatic Ecosystems (SAIIAE), NBA 2018 Rivers and Wetlands (Van Deventer *et al.,* 2019);
- National Freshwater Priority Areas, Rivers and Wetlands, 2011 (Nel *et al.,* 2011);
- Strategic Water Source Areas, 2021 (Lötter & Le Maitre, 2021).

8.1.1.4.1 The South African Inventory of Inland Aquatic Ecosystems

The SAIIAE was established during the 2018 NBA, the SAIIAE is a collection of spatial data layers that represent the extent of river and inland wetland ecosystem types as well as the pressures on these systems. The same two headline indicators, and their associated categorisations, are applied as with the terrestrial ecosystem NBA, namely Ecosystem Threat Status and Ecosystem Protection Level. The Ecosystem Threat Status of river and wetland ecosystem types are based on the extent to which each ecosystem type had been altered from its natural condition.

8.1.1.4.2 National Freshwater Ecosystem Priority Areas, Rivers and Wetlands

In an attempt to better conserve aquatic ecosystems, South Africa has categorised its inland aquatic systems according to set ecological criteria (i.e., ecosystem representation, water yield, connectivity, unique features, and threatened taxa) to identify FEPAs. The FEPAs are intended to be conservation support tools and it is envisioned that they will guide the effective implementation of measures to achieve the National Environment Management: Biodiversity Act's biodiversity conservation goals (Nel *et al.,* 2011).

8.1.1.4.3 Strategic Water Source Areas

SWSAs are defined as areas of land that supply a disproportionate quantity of mean annual surface water runoff in relation to their size, and therefore contribute considerably to the overall water supply of the country, as well as national aquatic and terrestrial biodiversity resources. These are considered key ecological infrastructure assets and the effective protection of SWSAs is vital for national security because a lack of water security will compromise national security and human wellbeing on all levels.

8.1.2 Wetland Field Survey

8.1.2.1 Identification and Mapping

The wetland areas were delineated in accordance with the DWAF (2005) guidelines, a cross section is presented in Figure 8-1. The outer edges of the wetland areas were identified by considering the following four specific indicators:

- The Terrain Unit Indicator helps to identify those parts of the landscape where wetlands are more likely to occur;
- The Soil Form Indicator identifies the soil forms, as defined by the Soil Classification Working Group (1991), which are associated with prolonged and frequent saturation;
- The soil forms (types of soil) found in the landscape were identified using the South African soil classification system namely; Soil Classification: A Taxonomic System for South Africa (Soil Classification Working Group, 1991);
- The Soil Wetness Indicator identifies the morphological "signatures" developed in the soil profile as a result of prolonged and frequent saturation; and
- The Vegetation Indicator identifies hydrophilic vegetation associated with frequently saturated soils.

Vegetation is used as the primary wetland indicator. However, in practise the soil wetness indicator tends to be the most important, and the other three indicators are used in a confirmatory role.

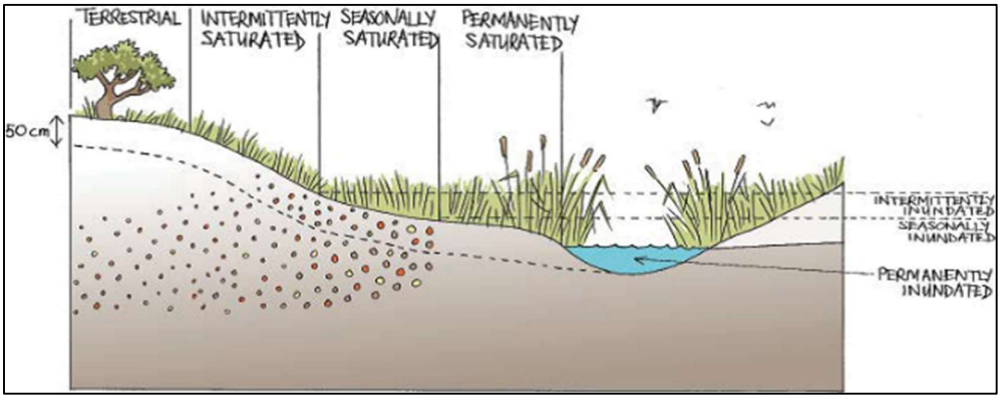


Figure 8-1 Cross section of a wetland, indicating how the soil wetness and vegetation indicators respond to changes in topography (Ollis et al. 2013)

8.1.2.2 Delineation

The wetland indicators described above are used to determine the boundaries of the wetlands within the Project Area. These delineations are then illustrated by means of maps accompanied by descriptions.

8.1.2.3 Classification and Description

The National Wetland Classification Systems (NWCS) developed by the South African National Biodiversity Institute (SANBI) will be considered for this study. This system comprises a hierarchical classification process of defining a wetland based on the principles of the hydrogeomorphic (HGM) approach at higher levels, and then also includes structural features at the lower levels of classification (Ollis *et al.,* 2013).

8.1.3 Wetland Functional and Ecological Assessment

8.1.3.1 Functional Assessment

Wetland Functionality refers to the ability of wetlands to provide healthy conditions for the wide variety of organisms found in wetlands as well as humans. Eco Services serve as the main factor contributing to wetland functionality.

The assessment of the ecosystem services supplied by the identified wetlands was conducted per the guidelines as described in WET-EcoServices (Kotze *et al.,* 2009). 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 8-1).

Table 8-1 Classes for determining the likely extent to which a benefit is being 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

8.1.3.2 Present Ecological Status

The overall approach as described by Macfarlane *et al.,* 2009, is to quantify the impacts of human activity or clearly visible impacts on wetland health, and then to convert the impact scores to a PES

score. This takes the form of assessing the spatial extent of impact of individual activities/occurrences and then separately assessing the intensity of impact of each activity in the affected area. The extent and intensity are then combined to determine an overall magnitude of impact. The Present State categories are provided in Table 8-2.

Table 8-2 The Present Ecological Status categories (Macfarlane et al., 2009)

Impact Category	Description	Impact Score Range	PES Score (%)	PES
None	Unmodified, natural.	0 to 0.9	90-00	A
Small	Largely Natural with few modifications. A slight change in ecosystem processes is discernible and a small loss of natural habitats and biota may have taken place.	1.0 to 1.9	80-89	B
Moderate	Moderately Modified. A moderate change in ecosystem processes and loss of natural habitats has taken place, but the natural habitat remains predominantly intact.	2.0 to 3.9	60-79	C
Large	Largely Modified. A large change in ecosystem processes and loss of natural habitat and biota has occurred.	4.0 to 5.9	40-59	D
Serious	Seriously Modified. The change in ecosystem processes and loss of natural habitat and biota is great, but some remaining natural habitat features are still recognisable.	6.0 to 7.9	20-39	E
Critical	Critically Modified. The modifications have reached a critical level and the ecosystem processes have been modified completely with an almost complete loss of natural habitat and biota.	8.0 to 10	0-19	F

8.1.3.3 Ecological Importance and Sensitivity

The importance and sensitivity of water resources is determined in order establish resources that provide higher than average ecosystem services, biodiversity support functions or are particularly sensitive to impacts. The mean of the determinants as described by Rountree *et al.,* 2013, is used to assign the EIS category as listed in Table 8-3.

Table 8-3 Description of Ecological Importance and Sensitivity categories

EIS Category	Range of Mean	Recommended Ecological Management Class
Very High	3.1 to 4.0	A
High	2.1 to 3.0	B
Moderate	1.1 to 2.0	C
Low Marginal	< 1.0	D

8.1.3.4 Recommended Ecological Category and Recommended Management Objective

The Recommended Ecological Category (REC) and Recommended Management Objective (RMO) (Table 8-4) was determined based on the results obtained from the PES and EIS of the assessed wetlands, with the objective of recommending how a water resource should be managed. This is achieved by either maintaining or improving the ecological integrity of the wetland in order to ensure continued ecological functionality (DWA, 1999).

Table 8-4 Recommended Ecological Category and Recommended Management Objectives for water resources based on Present Ecological State and Ecological Importance and Sensitivity scores

		Ecological Importance and Sensitivity			
PES		***Very High***	***High***	***Moderate***	***Low***
	A (Pristine)	A Maintain	A Maintain	A Maintain	A Maintain

	B (Natural)	A Improve	A/B Improve	B Maintain	B Maintain
	C (Good)	A Improve	B/C Improve	C Maintain	C Maintain
	D (Fair)	C Improve	C/D Improve	D Maintain	D Maintain
	E/F (Poor)	D Improve	E/F Improve	E/F Maintain	E/F Maintain

8.1.4 Buffer Requirements

The "Preliminary Guideline for the Determination of Buffer Zones for Rivers, Wetlands and Estuaries" (Macfarlane *et al.,* 2014) was used to determine the appropriate buffer zone for the proposed activity.

8.1.5 Site Sensitivty Verification

The baseline aquatic / freshwater sensitivity of the Project Area was obtained using the National Web-Based Environmental Screening Tool (Regulation 16(1)(v) of the EIA Regulations 2014, as amended). The allocated sensitivities for each of the relevant themes are either disputed or validated for the assessed areas based on the specialist assigned EIS of the different systems (where applicable), with consideration been given to the presence of observed or likely sensitive fauna and flora.

8.2 Appendix B – Risk and Impact Assessment

8.2.1 Risk Assessment

The DWS risk matrix assesses impacts in terms of consequence and likelihood. The significance of the impact is rated according to the classes presented in Table 8-5.

Table 8-5 Significance ratings matrix

Rating	Class	Management Description
1 – 29	(L) Low Risk	Acceptable as is or with proposed mitigation measures. Impact to watercourses and resource quality small and easily mitigated, or positive.
30 – 60	(M) Moderate Risk	Risk and impact on watercourses are notable and require mitigation measures on a higher level, which costs more and require specialist input. Licence required.
61 – 100	(H) High Risk	Watercourse(s) impacts by the activity are such that they impose a long-term threat on a large scale and lowering of the Reserve. Licence required.

8.2.2 Methodology for Assessing Impacts

The impacts of the proposed project will be assessed and rated according to the methodology described below and which was developed to align with the requirements of Appendix 3 of the Environmental Impact Assessment Regulations, 2014. The assessment process will follow a structured approach comprising four key activities:

- Identification and assessment of potential impacts likely to result from the project activities.
- Prediction of the nature, magnitude, extent, and duration of these impacts, with specific focus on those that may be significant.
- Identification of appropriate mitigation measures to reduce, avoid, or manage the severity or significance of the potential impacts.
- Evaluation of residual impacts to determine the significance of the impact after implementation of mitigation measures.

The assessment of significance was guided by a set of criteria, including:

- Cumulative impacts in the broader environmental and social context.

- Nature of the impact, i.e., whether it is positive, negative, direct, or indirect.
- Extent of the impact, ranging from localised to regional or national scale.
- Probability of occurrence of the impact.
- Reversibility of the impact, i.e., whether it can be restored to pre-impact conditions.
- Irreplaceability of affected resources, considering whether resources lost can be substituted or recovered.
- Potential for mitigation, i.e., the extent to which the impact can be avoided, minimised, or offset.

The evaluation of significance followed a consequence–probability approach:

Consequence = (Duration + Extent + Irreplaceability of resource) × Severity

The overall significance of an impact was then determined using the formula:

Significance = Consequence × Probability

A summary of the criteria used to assess the significance of impacts is provided in Table 8-6, with detailed explanations presented in Table 8-7.

Table 8-6 Criteria and Rating Scales to be used in the Assessment of the Potential Impacts

Criteria	Rating Scales	Notes
Nature	Positive (+)	An evaluation of the effect of the impact related to the proposed development.
	Negative (-)	
Duration	Temporary (1)	The duration of the activity associated with the impact will last 0 - 6 months.
	Short-term (2)	The duration of the activity associated with the impact will last 6-18 months.
	Medium-term (3)	The duration of the activity associated with the impact will last 18 months - 5 years.
	Long term (4)	The duration of the activity associated with the impact will last more than 5 years.
Extent	Footprint (1)	The impact only affects the area in which the proposed activity will occur.
	Site (2)	The impact will affect only the development area.
	Local (3)	The impact affects the development area and adjacent properties.
	Regional (4)	The effect of the impact extends beyond municipal boundaries.
	National (5)	The effect of the impact extends beyond more than 2 regional/ provincial boundaries.
	International (6)	The effect of the impact extends beyond country borders.
Severity	Low (1)	Where the impact affects the environment in such a way that natural, cultural, and social functions and processes are minimally affected.
	Moderate (2)	Where the affected environment is altered but natural, cultural, and social functions and processes continue albeit, in a modified way, and valued, important, sensitive, or vulnerable systems or communities are negatively affected.
	High (3)	Where natural, cultural, or social functions and processes are altered to the extent that the natural process will temporarily or permanently cease, and valued, important, sensitive, or vulnerable systems or communities are substantially affected.
Potential for impact on irreplaceable resources	No (0)	No irreplaceable resources will be impacted.
	Yes (1)	Irreplaceable resources will be impacted.
Consequence	Extremely detrimental (-25 to -33)	A combination of extent, duration, intensity, and the potential for impact on irreplaceable resources.
	Highly detrimental (-19 to -24)	

	Moderately detrimental (-13 to -18)	
	Slightly detrimental (-7 to -12)	
	Negligible (-6 to 0)	
	Slightly beneficial (0 to 6)	
	Moderately beneficial (13 to 18)	
	Highly beneficial (19 to 24)	
	Extremely beneficial (25 to 33)	
Probability (the likelihood of the impact occurring)	Improbable (0)	It is highly unlikely or less than 50% likely that an impact will occur.
	Probable (1)	It is between 50 and 70% certain that the impact will occur.
	Definite (2)	It is more than 75% certain that the impact will occur or the impact will occur.
Significance	Very high – negative (-49 to -66)	A function of Consequence and Probability.
	High – negative (-37 to -48)	
	Moderate – negative (-25 to -36)	
	Low – negative (-13 to -24)	
	Neutral - Very low (0 to -12)	
	Low positive (0 to 12)	
	Moderate–positive (13 to 24)	
	High–positive (37 to 48)	
	Very high – positive (49 to 66)	

Table 8-7 Explanation of Assessment Criteria

Criteria	Explanation
Nature	This is an evaluation of the type of effect the construction, operation, and management of the proposed development would have on the affected environment. Will the impact of change on the environment be positive, negative, or neutral?
Extent or Scale	This refers to the spatial scale at which the impact will occur. The extent of the impact is described as footprint (affecting only the footprint of the development), site (limited to the site), and regional (limited to the immediate surroundings and closest towns to the site). The extent of scale refers to the actual physical footprint of the impact, not to the spatial significance. It is acknowledged that some impacts, even though they may be of a small extent, are of very high importance, e.g., impacts on species of very restricted range. To avoid "double counting," specialists have been requested to indicate spatial significance under "intensity" or "impact on irreplaceable resources" but not under "extent" as well.
Duration	The lifespan of the impact is indicated as temporary, short, medium, and long term.
Severity	This is a relative evaluation within the context of all the activities and the other impacts within the framework of the project. Does the activity destroy the impacted environment, alter its functioning, or render it slightly altered?
Impact on irreplaceable resources	This refers to the potential for an environmental resource to be replaced should it be impacted. A resource could be replaced by natural processes (e.g., by natural colonisation from surrounding areas), through artificial means (e.g., by reseeding disturbed areas or replanting rescued species) or by providing a substitute resource, in certain cases. In natural systems, providing substitute resources is usually not possible, but in social systems, substitutes are often possible (e.g., by constructing new social facilities for those who are lost). Should it not be possible to replace a resource, the resource is essentially irreplaceable, e.g., red data species that are restricted to a particular site or habitat to a very limited extent.
Consequence	The consequence of the potential impacts is a summation of the above criteria, namely the extent, duration, intensity, and impact on irreplaceable resources.
Probability of occurrence	The probability of the impact occurring is based on the professional experience of the specialist with environments of a similar nature to the site and/or with similar projects. It is important to distinguish between the probability of the impact occurring and the probability that the activity causing a potential impact will occur. Probability is defined as the probability of the impact occurring, not as the probability of the activities that may result in the impact.
Significance	Impact significance is defined to be a combination of the consequence (as described below) and the probability of the impact occurring. The relationship between consequence and probability highlights that the impact (or impact significance) must be

	evaluated in terms of the seriousness (consequence) of the impact, weighted by the probability of the impact occurring. In simple terms, if the consequence and probability of an impact are high, then the impact will have a high significance. The significance defines the level to which the impact will influence the proposed development and/or environment. It determines whether mitigation measures need to be identified and implemented and whether the impact is important for decision making.
Degree of confidence in predictions	Specialists and the environmental team were required to indicate the degree of confidence (low, medium, or high) that there is in the predictions made for each impact based on the available information and their level of knowledge and expertise. The degree of confidence is not considered in the determination of consequence or probability.
Mitigation measures	Mitigation measures are designed to reduce the consequence or probability of an impact or to reduce both consequence and probability. The significance of impacts has been assessed both with mitigation and without mitigation.

8.2.3 Cumulative Assessment Methodology

"Cumulative impact, in relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities."

The cumulative impact assessment will be undertaken using a structured, qualitative methodology, supported by quantitative indicators where feasible. The assessment will evaluate the contribution of the proposed project in combination with existing developments and reasonably foreseeable future activities occurring within the surrounding landscape.

Cumulative impacts will be clearly defined and, where practicable, quantified, including but not limited to:

- Cumulative land transformation (expressed in hectares).
- Loss and fragmentation of natural and semi-natural habitats.
- Reduction in ecological connectivity.
- Cumulative pressure on aquatic systems and wetlands.
- Cumulative visual and landscape character change.
- Additive disturbance to biodiversity and ecosystem processes.

The identified cumulative impacts will be assessed and rated using the same significance rating methodology applied to project-specific impacts.

8.3 Appendix C – Specialist Declaration of Independence

Declaration

I, Khume Mtshweni, declare that:

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the Applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the Applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.



Khume Mtshweni

Ecologist

The Biodiversity Company

July 2026

8.4 Appendix D – Specialist CVs

Khume Mtshweni



Pr Sci Nat 138592 +27 63 772 7501 khume@thebiodiversitycompany.com

PROFILE SUMMARY

Environmental and ecological specialist with 8 years' consulting experience, with international working experience. Specialist experience in mining, engineering, agriculture, renewable energy, and private sector developments. Project management of national multi-disciplinary projects. Provides specialist guidance, technical support, and facilitation for compliance with in-country legislative requirements. Registered Pr Sci Nat with the South African Council for Natural Scientific Professions.

PERSONAL INFO

Nationality: South African

Date of birth: 06 August 1994

EXPERIENCE

Comprehensive Wetland assessments

Rehabilitation Plans and Monitoring

Environmental Management Programmes (EMP)

Surface and Ground water Biomonitoring

Faunal and Floral Assessments

SKILLS

- ✓ Ecology
- ✓ Rehabilitation
- ✓ Offsets
- ✓ Monitoring & Management Plans

LANGUAGES

English – Proficient
Afrikaans – Proficient
Sepedi – Proficient
Isizulu – Proficient
Isindebele – Proficient
Sesotho – Proficient
Tsonga - Conversational

Signed: Khume Mtshweni

ACADEMIC QUALIFICATIONS

University of Johannesburg (2020): MAGISTER SCIENTIAE (MSc) - Aquatic Health

University of Johannesburg (2017): BACCALAUREUS SCIENTIAE CUM HONORIBUS (Hons) – Zoology

University of Johannesburg (2016): BACCALAUREUS SCIENTIAE IN NATURAL AND ENVIRONMENTAL SCIENCES. Majors: Zoology and Physiology.

PROFESSIONAL EXPERIENCE

Apr 2023 – Present	**The Biodiversity Company** Ecology
March 2021 – March 2023	**Milnex CC** Ecologist / Manager
Jan 2017 – Jul 2020	**Golder Associates** Graduate Intern / Freshwater Ecology

INTERNATIONAL EXPERIENCE

Angola, Lesotho, South Africa