The Aquatic Biodiversity Compliance Statement for the Proposed Kareerand Battery Energy Storage Systems (Bess) and Grid Project

Potchefstroom Local Municipality, DR Kenneth Kaunda District Municipality, North West Province, South Africa

2/19/2024

Prepared by:

The Biodiversity Company

Cell: +27 81 319 1225

Fax: +27 86 527 1965

info@thebiodiversitycompany.com

www.thebiodiversitycompany.com

Report Name	**The Aquatic Biodiversity Compliance Statement for the Proposed Kareerand Battery Energy Storage Systems (Bess) and Grid Project**	
Specialist Theme	Aquatic Biodiversity Theme	
Project Reference	Kareerand BESS & OHL	
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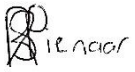
Environmental Assessment Practitioner	Cape EAPrac	
Fieldwork	Rian Pienaar (SACNASP 135544)	
Report Writer	Andrew Husted (SACNASP 400213/11)	
Declaration	The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, 2017. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science.	

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1 Introduction

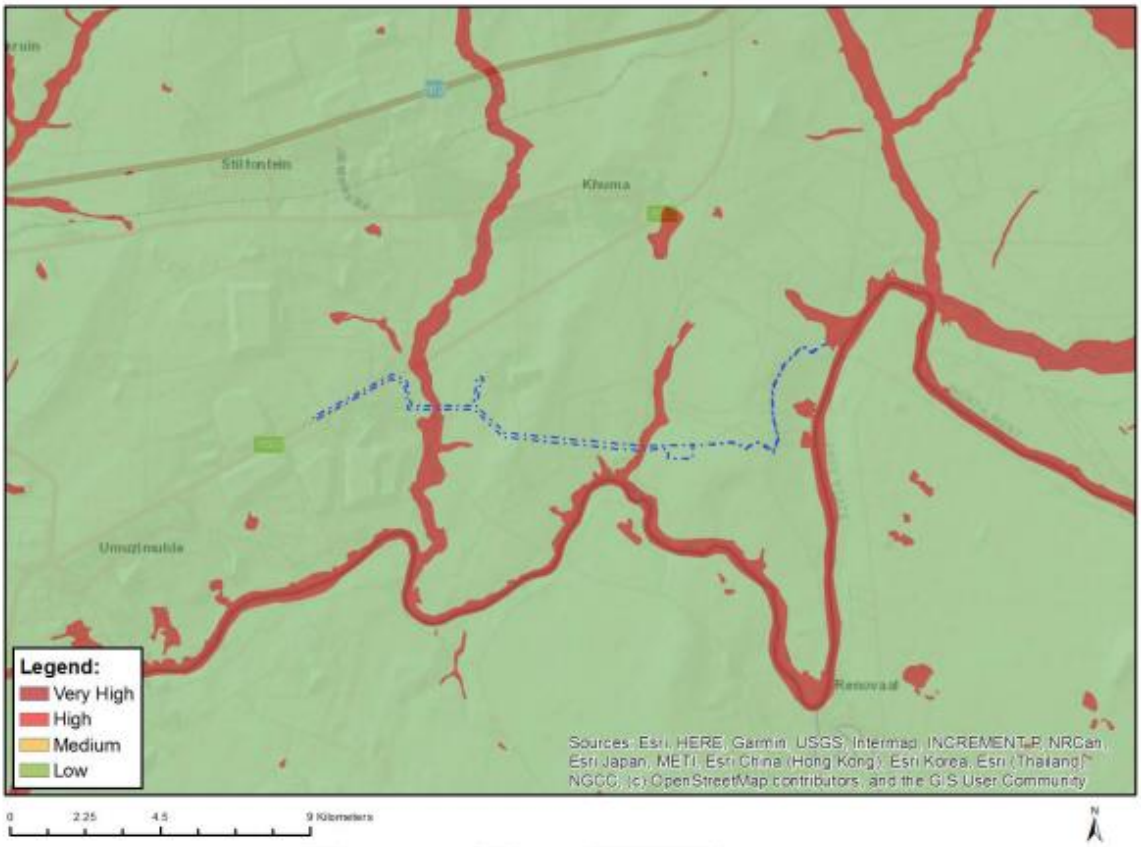
1.1 Background

The Biodiversity Company was appointed to complete an Aquatic Biodiversity compliance statement for the for the proposed Kareerand Battery Energy Storage Systems (BESS) and the 132 kV Overhead Power Line (OHL), located approximately 6.5 km south of a mining town of Khuma and furthermore, 31 km south-west of Potchefstroom, in the North West Province. The proposed project area is found within the Potchefstroom Local Municipality in the Dr Kenneth Kaunda District Municipality. This development area is referred to as the Project Area of Influence (PAOI), comprising the BESS, access road and OHL corridor.

This assessment was conducted in accordance with the amendments to the Environmental Impact Assessment Regulations. 2014 (GNR 326, 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 Government Notices (GN) 320 (20 March 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). The National Web based Environmental Screening Tool has characterised the aquatic theme sensitivity as predominantly “Low” for the PAOI (Figure 1-1), with suspected wetland areas and rivers characterised as “Very High” sensitivity.

The purpose of conducting the specialist study is to provide relevant input into the overall Environmental Authorisation application process, with a focus on the proposed project activities and their associated impacts. This report, after taking into consideration the findings and recommendations provided by the specialist herein, should inform and guide the Registered Environmental Assessment Practitioner (EAP) and regulatory authorities, enabling informed decision making as to the ecological viability of the proposed project.

MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity
Very High	ESA 1
Very High	Rivers_EF
Very High	Wetlands_Dry Highveld Grassland Bioregion (Valley-bottom)
Very High	Wetlands_Mesic Highveld Grassland Bioregion (Seep)

Figure 1-1 The aquatic biodiversity theme sensitivity

1.2 Project Area

A map of the PAOI in relation to the local region is presented in Figure 1-2. A map illustrating the proposed layout of to be assessed is presented in Figure 1-3.

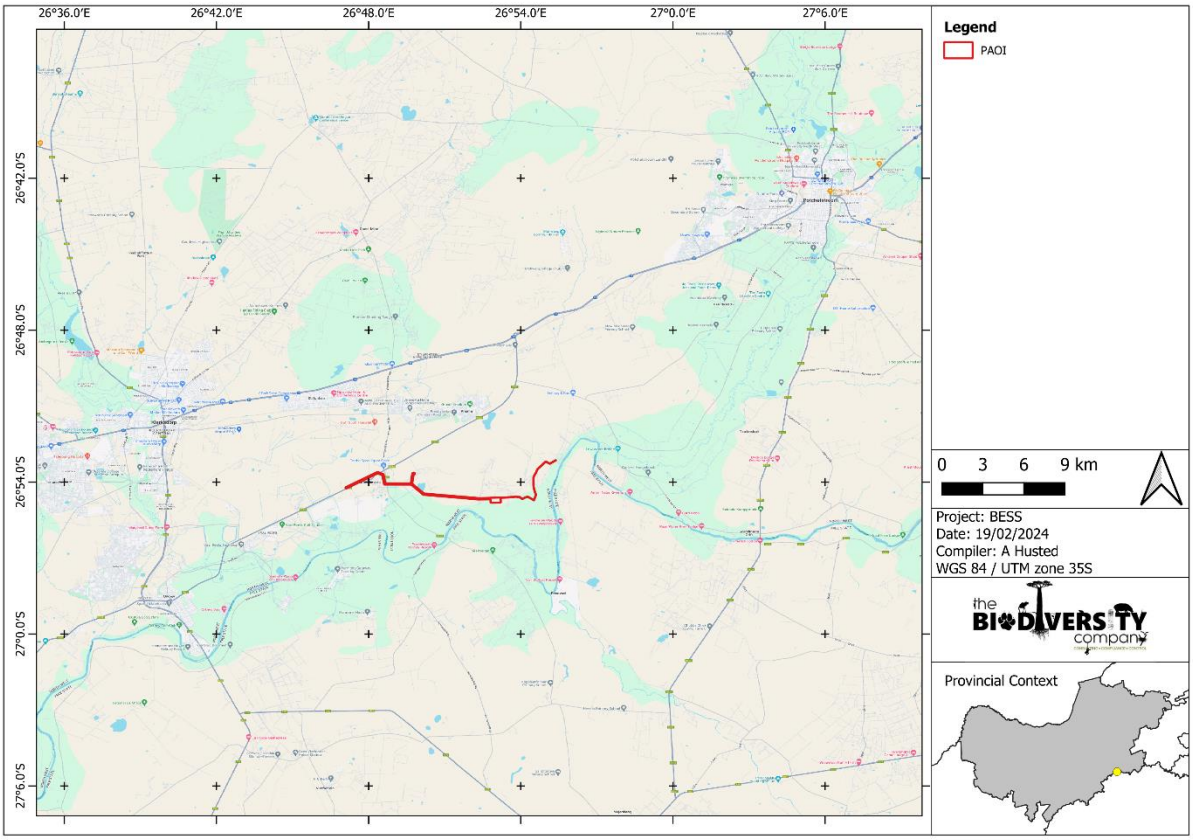


Figure 1-2 Spatial context of the proposed development

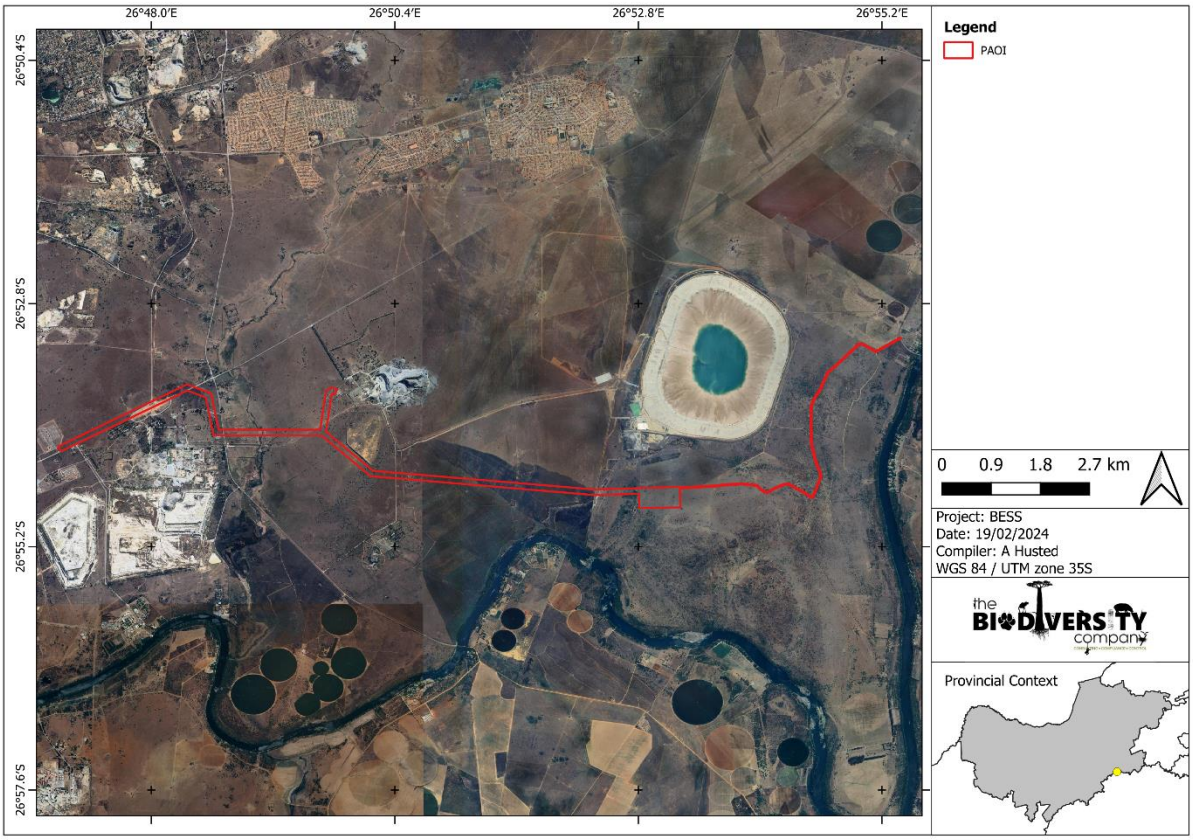


Figure 1-3 The proposed components of the project

1.3 Project Description

Kareerand BESS (Pty) Ltd is proposing the construction of the Kareerand Battery Energy Storage (BESS) Facility, consisting of a BESS and solar photovoltaic (PV) infrastructure located on Portion 3 of the Farm Kareerand No. 444, approximately 22 km east of Klerksdorp within the North West Province.

The Applicant is also proposing to upgrade the existing access road on Portion 3 of the Farm Kareerand No. 444, Portion 4 of the Farm Kareerand 444, Portion 16 of the Farm Kromdraai 420, Portion 17 of the Farm Kromdraai 420, Farm Umfula No. 575, Portion 20 of Farm Umfula No. 567 and Portion 56 of the Farm Kromdraai 420; and to construct new 132kV grid connection infrastructure on Portion 3 of the Farm Kareerand No. 444, Portion 15 of the Farm Kromdraai 443, Remainder of Portion 5 of Farm no. 422, Portion 6 of the Farm Buffelsfontein 443, Portion 3 of the Farm Kareerand 444, Portion 2 of the Farm Buffelsfontein 443, Portion 103 of the Farm Hartebeestfontein 422, Portion 38 of the Farm Hartebeestfontein 422, Portion 79 of the Farm Hartebeestfontein 422, Portion 8 of the Farm Hartebeestfontein 422, Portion 2 of the Farm Mapaiskraal No. 441, Portion 41 of the Farm Hartebeestfontein 422 and Portion 4 of the Farm Mapaiskraal 441.

The Kareerand BESS facility will have a total development footprint of up to approximately 25 ha and will have a maximum export capacity of up to 77 MW. The development area is situated within the City of Matlosana Local Municipality and the JB Marks Local Municipality. The site is accessible via existing tarred and gravel roads to the north-east of the site. These existing gravel roads will be upgraded to a maximum width of 8m.

The proposed Kareerand BESS facility will include the following infrastructure:

- PV modules and mounting structures (up to 10 ha);
- Inverters and transformers;
- Solid State Battery Energy Storage System (BESS) (up to 10 ha);
- Site and internal access roads (up to 8m wide);
- Operation and Maintenance buildings including a gate house and security building, control centre, offices, warehouses and workshops for storage and maintenance (up to 1 ha);
- Laydown areas (3 ha temporary and 1 ha permanent);
- A 132 kV facility substation (up to 1 ha); and
- 33 kV cabling between the project components and the facility substation.

The project will also include Grid connection infrastructure consisting of:

- A 132 kV Eskom Switching Station (up to 1 ha).
- 132 kV powerline (up to 11.5 km long) connecting the Eskom switching station to the Hermes Main Transmission Substation (a grid connection corridor of 100m wide will be assessed to allow for environmental sensitivities and/or micro-siting).

The Grid connection infrastructure, although assessed cumulatively with the BESS, will be subject to a separate environmental application process administered by the provincial authority.

1.4 Legislative Framework

In line with the protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial biodiversity, as per Government Notice 320 published in terms of NEMA, dated 20 March 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" – 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:
    - "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.

An Aquatic Biodiversity Compliance Statement must contain the information as presented in Table 1-1below.

Table 1-1 Aquatic Biodiversity Compliance Statement 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
contact details of the specialist, their SACNASP registration number, their field of expertise and a curriculum vitae	6
a signed statement of independence by the specialist	Appendix A
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 / 3.3
a baseline profile description of biodiversity and ecosystems of the site	3.3
the methodology used to verify the sensitivities of the aquatic biodiversity features on the site including the equipment and modelling used where relevant;	2
in the case of a linear activity, confirmation from the aquatic biodiversity specialist that, in their opinion, based on the mitigation and remedial measures proposed, the land can be returned to the current state within two years of completion of the construction phase	4.1
where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr	3.6.3
a description of the assumptions made as well as any uncertainties or gaps in knowledge or data	2.7
any conditions to which this statement is subjected	4.3

A signed copy of the compliance statement must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.

2 Methodology

A site visit was conducted on 6th February 2024, which is considered a suitable (wet) season to undertake a freshwater assessment.

2.1 Identification and Mapping

The wetland areas were delineated in accordance with the DWAF (2005) guidelines, a cross section is presented in Figure 2-1. 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 practice the soil wetness indicator tends to be the most important, and the other three indicators are used in a confirmatory role.

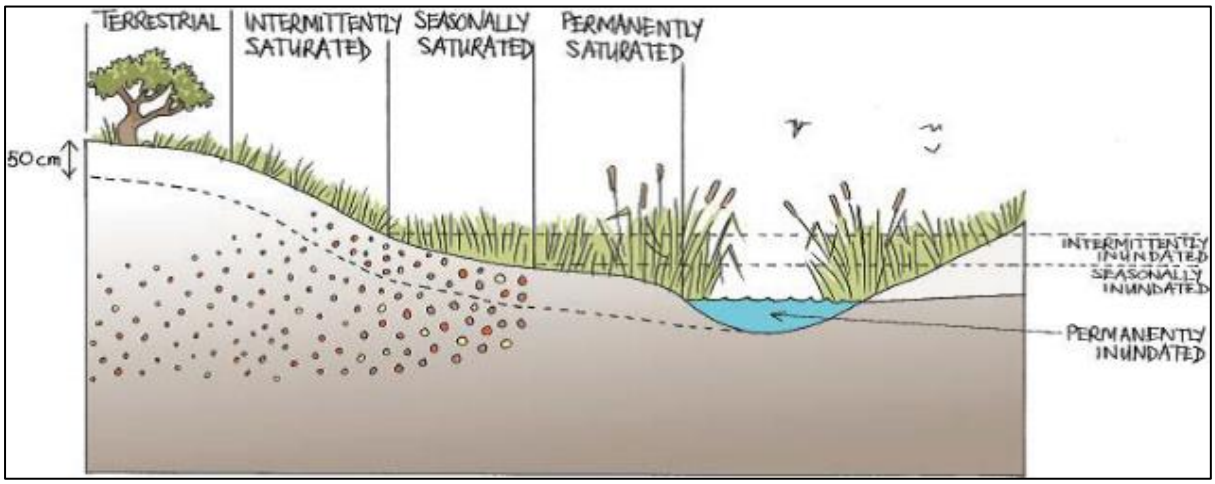


Figure 2-1 Cross section through a wetland, indicating how the soil wetness and vegetation indicators change (Ollis et al. 2013)

The DWAF (2005) manual separates the classification of watercourses into three (3) separate types of channels or sections defined by their position relative to the zone of saturation in the riparian area. 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.

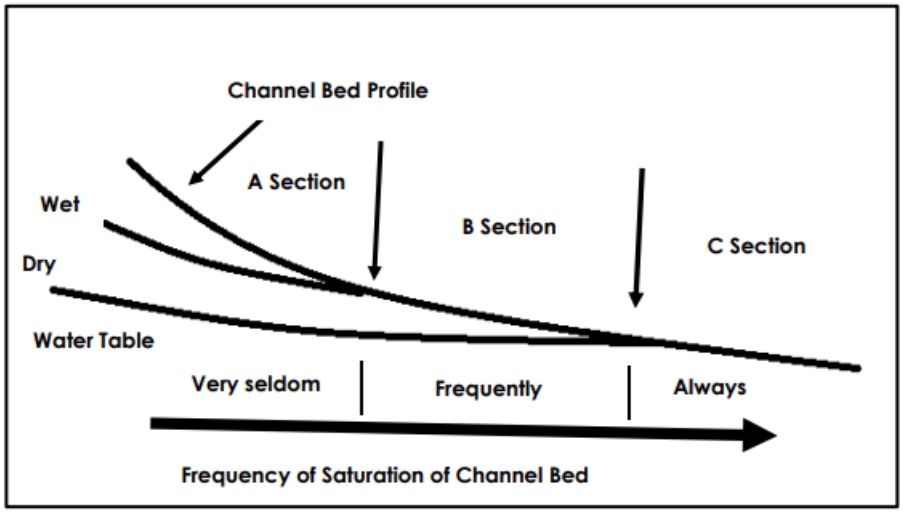


Figure 2-2 The watercourse classifications (DWAF, 2005)

2.2 Ecological 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).

2.3 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 serves 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. 2008). 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 2-1).

Table 2-1 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

2.4 Present Ecological Status

The overall approach is to quantify the impacts of human activity or clearly visible impacts on wetland health, and then to convert the impact scores to a Present Ecological Status (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 2-2.

Table 2-2 The Present Ecological Status categories (Macfarlane, et al., 2008)

Impact Category	Description	Impact Score Range	PES
None	Unmodified, natural	0 to 0.9	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	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	C
Large	Largely Modified. A large change in ecosystem processes and loss of natural habitat and biota has occurred.	4.0 to 5.9	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 recognizable.	6.0 to 7.9	E
Critical	Critical Modification. 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	F

2.5 Importance and Sensitivity

The importance and sensitivity of water resources is determined to establish resources that provide higher than average ecosystem services, biodiversity support functions or are particularly sensitive to impacts. The mean of the determinants is used to assign the Importance and Sensitivity (IS) category as listed in Table 2-3.

Table 2-3 Description of Importance and Sensitivity categories

IS 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**

2.6 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.

2.7 Limitations

The following limitations should be noted for the assessment:

- The assessment area was based on the spatial file provided by the client and any alterations to the development area may affect the results;
- The seasonality of the site survey is not considered to be a limiting factor for this project; and
- It is noted that the aquatic theme sensitivity for the area is “Low”, with suspected wetland areas and rivers characterised as “Very High” sensitivity.

3 Receiving Environment

3.1 South African Inventory of Inland Aquatic Ecosystems

The South African Inventory of Inland Aquatic Ecosystems (SAIIAE) wetland dataset is a recent outcome of the National Biodiversity Assessment (NBA, 2018) and, was a collaborative project by the South African National Biodiversity Institute (SANBI) and the Council for Scientific and Industrial

Research (CSIR). The SAIIAE dataset provides further insight into wetland occurrences and extents building on the information from the NFEPA, as well as other datasets. The proposed corridor will traverse a seepage and valley bottom system associated with the OHL within the PAOI (Figure 3-1).

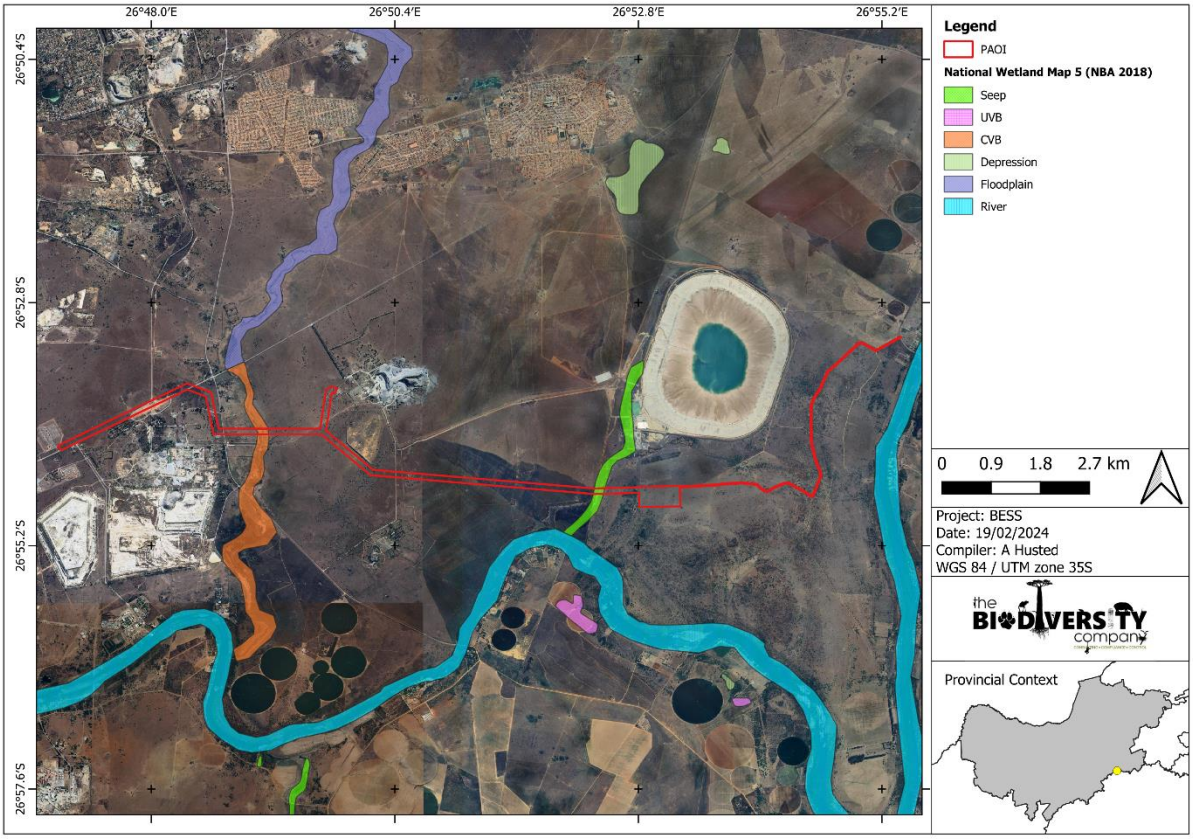


Figure 3-1 The NWM5 database in relation to the PAOI

3.2 National Freshwater Ecosystem Priority Areas

The National Freshwater Ecosystem Priority Areas (NFEPA) database forms part of a comprehensive approach to the sustainable and equitable development of South Africa's scarce water resources. This database provides guidance on how many rivers, wetlands and estuaries, and which ones, should remain in a natural or near-natural condition to support the water resource protection goals of the National Water Act (Act 36 of 1998) (NWA). This directly applies to the NWA, which feeds into Catchment Management Strategies, water resource classification, reserve determination, and the setting and monitoring of resource quality objectives (Nel et al., 2011). The NFEPAs are intended to be conservation support tools and envisioned to guide the effective implementation of measures to achieve the biodiversity goals of the National Environment Management Biodiversity Act (NEM:BA) (Act 10 of 2004), informing both the listing of threatened freshwater ecosystems and the process of bioregional planning provided for by this Act (Nel et al., 2011). The PAOI will traverse a river system and partially extend into a non-priority wetland system (Figure 3-2).

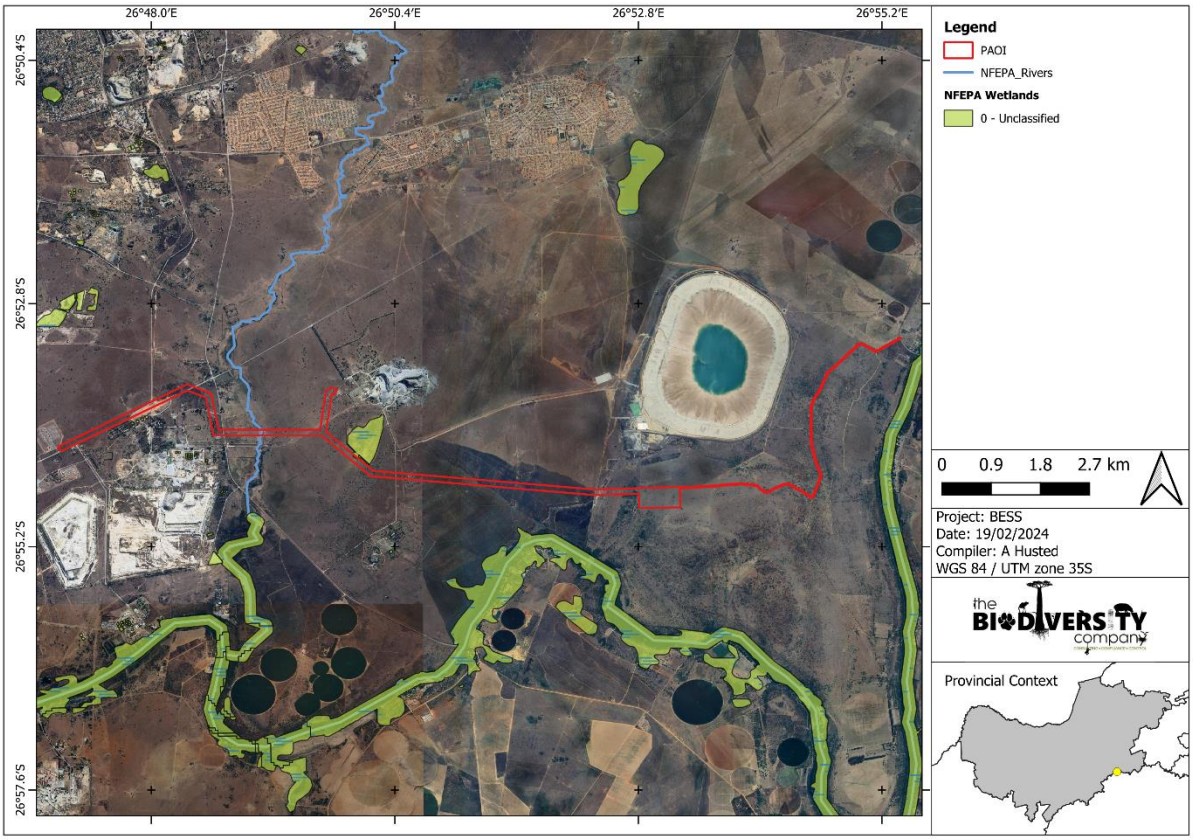


Figure 3-2 The NFEPA database in relation to the PAOI

3.3 Survey Results

The water resources were delineated in accordance with the DWAF (2005) guidelines. A site visit was conducted on 6th February 2024, this would constitute a wet season survey. The development area was traversed on foot, with serval checks being undertaken to identify any soil wetness indicators, and to determine the local soil forms.

Two (2) hydro-geomorphic unit was identified traversing the PAOI, namely an unchanneled valley bottom (UCVB) wetland and a floodplain system. This system will be traversed by the OHL only. Figure 3-3 presents the delineated system in relation to the PAOI. Photographs of the system are presented in Figure 3-4. Due to the avoidance of any appreciable level of risk to the system, succinct findings from the functional assessment are presented in the subsequent sections.

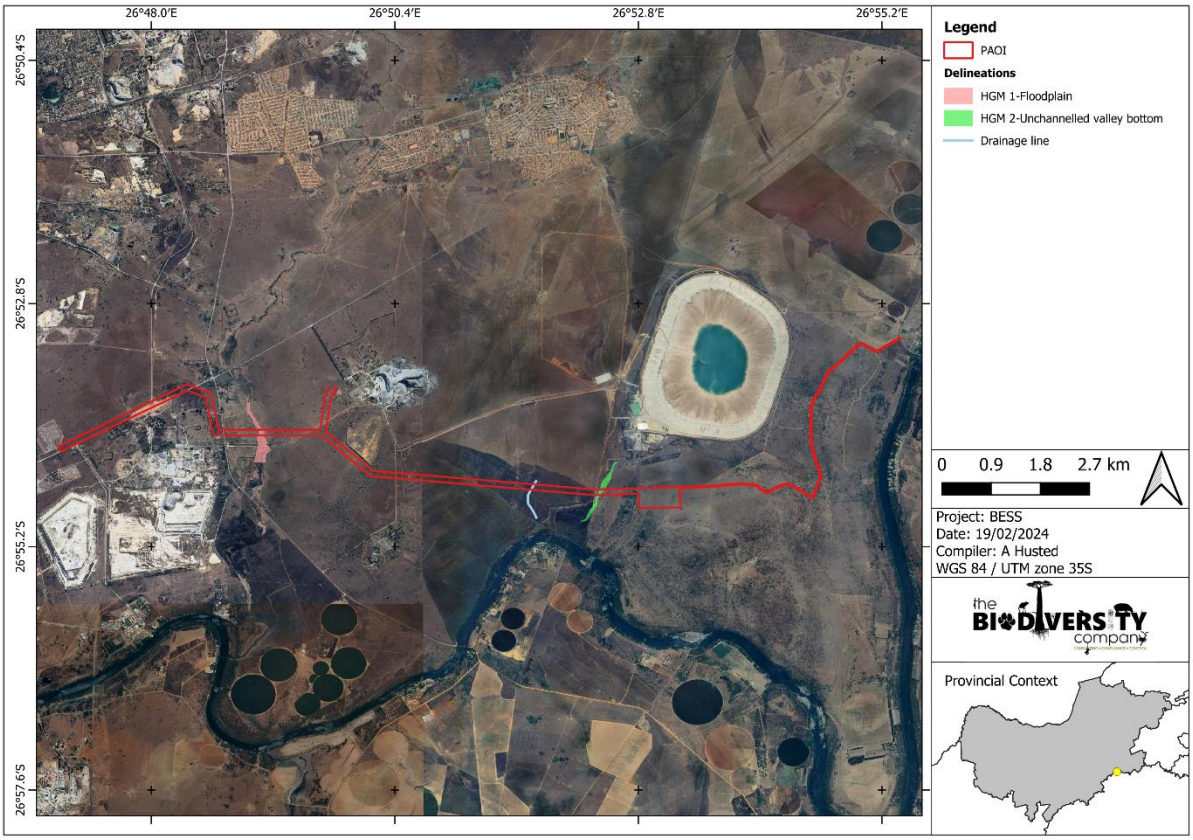


Figure 3-3 The delineated system of the PAOI

Figure 3-4 A photograph of the delineated floodplain (left) and valley bottom system (right) within the PAOI

Unchannelled valley bottom wetlands are typically found on valley floors where the landscape does not allow high energy flows. Figure 3-5 presents a diagram of a typical unchannelled valley bottom wetland, showing the dominant movement of water into, through and out of the system.

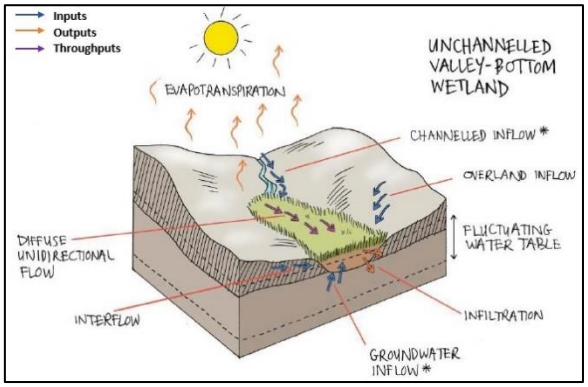


Figure 3-5 Amalgamated diagram of a typical unchannelled valley bottom, highlighting the dominant water inputs, throughputs and outputs, SANBI guidelines (Ollis et al. 2013)

Floodplain wetlands are located on valley floors and are characterised by a well-defined stream channel with typical floodplain features, including levees, scroll bars and oxbows. The water inputs of this wetland is mainly from overspills from the stream channel's banks during flooding events. Figure 3-6 presents a diagram of the delineated floodplain, showing the dominant movement of water into, through and out of the system.

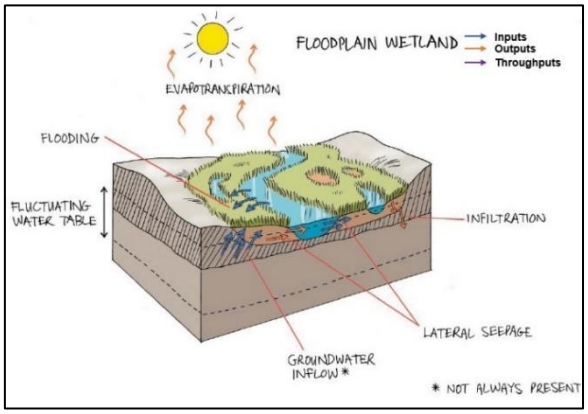


Figure 3-6 Amalgamated diagram of a typical floodplain system, highlighting the dominant water inputs, throughputs and outputs, SANBI guidelines (Ollis et al. 2013)

3.3.1 Functional Assessment

The ecosystem services provided by the wetland units identified on site were assessed and rated using the WET-EcoServices method (Kotze *et al.,* 2008). The overall functional benefit of the services provided by the systems were determined to be moderate (class C).

Unchannelled valley bottoms are characterised by sediment deposition, a gentle gradient with streamflow generally being spread diffusely across the wetland, ultimately ensuring prolonged saturation levels and high levels of organic matter. The assimilation of toxicants, nitrates and phosphates are usually high for unchanneled valley-bottom wetlands, especially in cases where the valley is fed by sub-surface interflow from slopes. The shallow depths of surface water within this system adds to the degradation of toxic contaminants by means of sunlight penetration.

Floodplains generally are formed during high flow events which subsequently cause water to overspill its banks. Due to the topographic setting of floodplains, flood attenuation for these systems are very high, especially during seasons where the soil within the wetland is not yet saturated and before the oxbows are filled. Seeing that floodplains usually are characterised by clayey soils which retain water for long periods and are susceptible to vast amounts of evapotranspiration, very little streamflow

regulation is expected for floodplains. In hindsight, floodplains with course soil types are ideal in regulating streamflow. Floodplains are excellent in assimilating phosphates due to the decrease in velocity during the overspill of banks. During this process, lateral deposition of sediment is prone to happen. Phosphorus tends to bound strongly to mineral particles which ensures that the phosphorus is retained on the floodplain after the deposition of these particles. Denitrification does occur to a lesser extent due to little exposure of large amounts of water seeing that these water masses are dependent on floods. Additionally, sub-surface flows are rare for floodplains which decrease the possibility of denitrification even more so.

It is however important to note that the descriptions of the above-mentioned functions are merely typical expectations. All wetland systems are unique and therefore, the ecosystem services rated high for these systems on site might differ slightly to those expectations.

3.3.2 Present Ecological Status

The integrity of the systems was determined to be Largely Modified (class D). Considering the anthropogenic activities and influences within the landscape, several negative impacts to wetlands are expected for the area. These include:

- The altered hydrological regime of the system, caused by linear infrastructure traversing the system;
- The geomorphic changes due to the encroachment of agriculture on the system;
- The impacts to the system caused by commercial farming in the area; and
- The establishment of alien vegetation for the system.

3.3.3 Importance and Sensitivity

The results of the ecological IS assessment are shown in the table below. The ecological IS of the systems was determined to be moderate (class C). Various components pertaining to the protection status of a wetland is considered for the IS, including SWSAs, the NFEPA wet Veg protection status and the protection status of the wetland itself, considering the NBA wetland dataset.

At a regional scale, the NFEPA Wetveg database recognises valley bottom wetland and floodplain type within the Dry Highveld Grassland Group 5 as Endangered (EN) and Least Threatened (LT) respectively (Nel and Driver, 2012). The following was also considered for the IS description, the project area:

- The Rand Highveld Grassland and Vaal Reefs Dolomite Sinkhole Woodland vegetation types are Vulnerable and Least Concern respectively;
- Is not located in a SWSA;
- Does traverse with designated ESAs; and
- The potential presence of species of conservation concern for the area is limited.

3.3.4 Recommended Ecological Category and Recommended Management Objective

The REC and RMO for the wetland area was determined from the results of the PES and ecological IS assessments. These assessments indicated that the wetland system, had to an extent, underwent transformation as a result of historical and current impacts. Nevertheless, despite the altered ecological integrity of the system, it is considered to provide important ecological services. The appropriate REC and RMO estimated for the wetland areas is presented in Table 3-1 below.

Table 3-1 Summary of the REC and RMO categories assigned to the relevant wetland

HGM Unit	REC – RMO
Valley Bottom & floodplain	D - Maintain

3.3.5 Buffer Requirements

The "*Buffer zone guidelines for wetlands, rivers and estuaries*" (Macfarlane *et al.,* 2014) was used to determine the appropriate wetland buffer zone for the proposed project.

Buffer zones have been used in land-use planning to protect natural resources and limit the impact of one land-use on another. A buffer zone has been prescribed for this project to serve as a "barrier" between the proposed development and the wetland systems. This buffer area would only be applicable to wetland areas that will not be lost or where infrastructure is required to traverse a system due to the project.

The wetland buffer zone tool was used to calculate the appropriate buffer required for the proposed linear infrastructure, namely the powerline. The model shows that the largest risk posed by the project during the construction phase is that of "increased sediment inputs and turbidity". During the operational phase, the flow patterns being altered (increase flood peaks); increased sediment inputs; and altered water quality are high risks. These risks are based on what could threaten the wetland and what buffer would be required at a desktop level. A post-mitigation buffer of 15 m is recommended for the wetland.

Table 3-2 Post-mitigation buffer requirement

Required Buffer after mitigation measures have been applied	
Valley Bottom	**15 m**

Only infrastructure and activities required for the traversing of these water resources are permitted within the recommended buffer areas, all other aspects must adhere to the buffer widths.

3.4 Ecological Sensitivity

The National Web based Environmental Screening Tool has characterised the aquatic theme sensitivity of the PAOI as "Low" sensitivity, with suspected wetland areas and rivers characterised as "Very High" sensitivity.

Table 3-3 provides a comparison between the Environmental Screening Tool and the specialist determined Site Ecological Importance (SEI) of the project. The specialist-assigned sensitivity ratings are based largely on the SEI process.

Table 3-3 Summary of the Screening Tool Sensitivity versus the Specialist assigned Site Ecological Importance (SEI) for the Field Survey Area of the Project Area

Screening Tool Theme	Screening Tool	System	Specialist	Tool Validated or Disputed by Specialist - Reasoning
Aquatic Biodiversity Theme	Low	-	Low	Confirmed – No natural water resources located within the BESS / PAOI.
	Very High	-	Medium	Disputed – The system is of moderate ecological importance and sensitive. The risks to the system are negligible for the OHL and all direct risks can be avoided.

3.5 Impact Assessment: BESS & Road

No natural wetlands or rivers are located within the PAOI. No systems will be directly affected by the proposed development. The access road will constitute the upgrade of an existing route. Based on this, the undertaking of an impact assessment is not necessary (nor feasible) for the proposed project.

3.6 Impact Assessment: OHL

Potential impacts were evaluated against the data captured during the fieldwork and from a desktop perspective to identify relevance to the project area of interest, specifically the proposed development footprint area. Bennun *et al* (2021) describes three broad types of impacts associated with solar energy development:

- Direct impacts – Impacts that result from project activities or operational decisions that can be predicted based on planned activities and knowledge of local biodiversity, such as habitat loss under the project footprint, habitat fragmentation as a result of project infrastructure and species disturbance or mortality as a result of project operations;
- Indirect impacts – Impacts induced by, or 'by-products' of, project activities within a project's area of influence; and
- Cumulative impacts – Impacts that result from the successive, incremental and/or combined effects of existing, planned and/or reasonably anticipated future human activities in combination with project development impacts.

The assessment of impact significance considers pre-mitigation as well as implemented post-mitigation scenarios. Two phases were considered for the impact assessment, with the grid assume to be permanent and no decommissioning phase required:

- Construction Phase; and
- Operational Phase.

3.6.1 Construction Phase

The following impacts were considered during the construction phase:

- Loss, disturbance and degradation of wetland systems;
- Loss or degradation in ecosystem services;
- Altered hydrological regimes;
- Increase in erosion and sedimentation of receiving systems;
- Introduction and spread of alien and invasive vegetation;
- Impaired water quality.

The pre-mitigation and post-mitigation impact ratings for the construction phase are shown in Table 3-4.

Table 3-4 Impacts associated with the Construction Phase

Nature of the Impact	Status	Cumulative Effect	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable ?
Loss, disturbance and/or degradation of wetland systems;	Before mitigation	2	28	Low (6-28)	Yes	Yes
	After mitigation	1	8	Low (6-28)		
Loss or degradation in ecosystem services;	Before mitigation	2	28	Low (6-28)	Yes	Yes

	After mitigation	1	8	Low (6-28)		
Altered hydrological regimes;	Before mitigation	2	28	Low (6-28)	Yes	Yes
	After mitigation	1	7	Low (6-28)		
Increase in erosion and sedimentation of receiving systems;	Before mitigation	2	24	Low (6-28)	Yes	Yes
	After mitigation	1	6	Low (6-28)		
Introduction and spread of alien and invasive vegetation;	Before mitigation	2	24	Low (6-28)	Yes	Yes
	After mitigation	1	6	Low (6-28)		
Impaired water quality.	Before mitigation	2	26	Low (6-28)	Yes	Yes
	After mitigation	1	6	Low (6-28)		

3.6.2 Operation Phase

The following impacts were considered during the operational phase:

- Loss or degradation in ecosystem services;
- Altered hydrological regimes;
- Increase in erosion and sedimentation of receiving systems; and
- Introduction and spread of alien and invasive vegetation.

The pre-mitigation and post-mitigation impact ratings for the construction phase are shown in Table 3-5.

Table 3-5 Impacts associated with the Operational phase

Nature of the Impact	Status	Cumulative Effect	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable ?
Loss or degradation in ecosystem services;	Before mitigation	2	24	Low (6-28)	Yes	Yes
	After mitigation	1	6	Low (6-28)		
Altered hydrological regimes;	Before mitigation	2	26	Low (6-28)	Yes	Yes
	After mitigation	1	6	Low (6-28)		
Increase in erosion and sedimentation of receiving systems;	Before mitigation	2	24	Low (6-28)	Yes	Yes
	After mitigation	1	6	Low (6-28)		
Introduction and spread of alien and invasive vegetation;	Before mitigation	2	26	Low (6-28)	Yes	Yes
	After mitigation	1	6	Low (6-28)		

3.6.3 Management Outcomes

The aim of the management outcomes is to present the mitigations in such a way that the can be incorporated into the Environmental Management Programme (EMPr), allowing for more successful implementation and auditing of the mitigations and monitoring guidelines. Table 3-6 presents the prescribed mitigation measures for the assessment.

Table 3-6 project management measures for the water resources

Nature of the Impact	Proposed Mitigation Measures
Construction Phase	
Loss, disturbance and degradation of wetland systems;	• Avoid wetlands and buffers where feasible. Restrict infrastructure and activities required for the traversing of the water resource within the recommended buffer areas, all other aspects must adhere to the buffer widths. • Cleared areas must be rehabilitated and stabilised to avoid impacts to adjacent wetland and buffer areas. • Reduce the disturbance footprint and the unnecessary clearing of vegetation when traversing the wet areas. • Make use of existing access routes as much as possible, before new routes are considered. Any selected "new" route must not encroach into the wetland areas.
Loss or degradation in ecosystem services;	• Cleared areas must be rehabilitated and stabilised to avoid impacts to adjacent wetland and buffer areas. • Reduce the disturbance footprint and the unnecessary clearing of vegetation when traversing the wet areas. • Promptly remove all alien and invasive plant species that may emerge during construction (i.e. weedy annuals and other alien forbs) must be removed.
Altered hydrological regimes;	• Keep excavation and soil heaps neat and tidy. • Ensure soil stockpiles sand are sufficiently safeguarded against rain wash. • Mixing of concrete must under no circumstances take place in any wetland or their buffers.. • Avoid the unauthorised placement of components within wetlands and buffer areas where feasible. • Do not situate any of the construction material laydown areas within any wetland or buffer area. Try adhere to the buffer in these instances. • No machinery should be allowed to parked in any wetlands or buffer areas.
Increase in erosion and sedimentation of receiving systems;	• Limit soil disturbance • Appropriately stockpile topsoil cleared from the development footprint. • Minimize unnecessary clearing of vegetation beyond the development footprints. • Keep excavation and soil heaps neat and tidy. • Ensure soil stockpiles and concrete / building sand are sufficiently safeguarded against rain wash.
Introduction and spread of alien and invasive vegetation;	• Promptly remove all alien and invasive plant species that may emerge during construction (i.e. weedy annuals and other alien forbs) must be removed. • Limit soil disturbance • The use of herbicides is not recommended in or near wetlands (opt for mechanical removal). • Appropriately stockpile topsoil cleared from the development footprint. • Clearly demarcate development construction footprint, and limit all activities to within this area. • Minimize unnecessary clearing of vegetation beyond the development footprints. • Lightly till any disturbed soil around the development footprint to avoid compaction.
Impaired water quality.	• Make sure all excess consumables are removed from site and deposited at an appropriate waste facility. • Appropriately contain any generator diesel storage tanks, machinery spills (e.g. accidental spills of hydrocarbons oils, diesel etc.) or construction materials on site (e.g. concrete) in such a way as to prevent them leaking and entering wetland or buffer areas. • Mixing of concrete must under no circumstances take place within the wetland or buffer areas. • Check for oil leaks, keep a tidy operation, and promptly clean up any spills or litter. • Provide appropriate sanitation facilities for workers during construction and service them regularly. • The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected must be disposed of at a licensed disposal facility; • The Contractor must be in possession of an emergency spill kit that must be complete and available at all times on site. • Any possible contamination of topsoil by hydrocarbons must be avoided. Any contaminated soil must be treated in situ or be placed in containers and removed from the site for disposal in a licensed facility.
Operational Phase	
Loss or degradation in ecosystem services;	• Ensure successful rehabilitation of areas disturbed during construction and these areas are stabilised to avoid impacts to adjacent wetland and buffer areas. • Control all alien and invasive plant species that may emerge during operation (i.e. weedy annuals and other alien forbs) must be removed.
Altered hydrological regimes;	• Avoid the unauthorised placement of components within wetlands and buffer areas where feasible. • No machinery should be allowed to parked in any wetlands or buffer areas.

Increase in erosion and sedimentation of receiving systems;	• Ensure successful rehabilitation of areas disturbed during construction and these areas are stabilised to avoid impacts to adjacent wetland and buffer areas.
Introduction and spread of alien and invasive vegetation;	• Implement the eradication and control of alien and invasive plant species that may emerge during operation (i.e. weedy annuals and other alien forbs) must be removed.

3.7 Cumulative Impacts

The quantitative impact of the proposed project in isolation on freshwater biodiversity is anticipated to be "Low" due to the expected avoidance of these systems and adherence to the buffer widths (Table 3-7). The cumulative impact of the proposed project on freshwater biodiversity is also anticipated to be "Medium". It should be noted that pre-existing modifications to the wetland systems do exist to some degree. Due to the fact that the sensitive area can be avoided by the proposed development layout and the other suggested measures be implemented, the wetland's integrity and functionality conditions are not expected to deteriorate further as a result of the proposed development and no irreplaceable loss of freshwater biodiversity is anticipated.

Table 3-7 Cumulative Impacts to avifauna associated with the proposed project

Status	Cumulative Effect	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable ?
Impact in isolation	1	10	Low (6-28)	Yes	Yes
Cumulative impact	2	33	Medium (29-50)		

4 Conclusions

The development area was traversed on foot, with serval checks being undertaken to identify any soil wetness indicators, and to determine the local soil forms.

Two (2) hydro-geomorphic unit was identified traversing the PAOI, namely an unchanneled valley bottom (UCVB) wetland and a floodplain system. The following is summarised for the functional assessment:

- The overall functional benefit of the services provided by the systems were determined to be moderate (class C);
- The integrity of the systems was determined to be Largely Modified (class D);
- The ecological importance and sensitivity of the systems was determined to be moderate (class C);
- The recommended ecological category for the system I to maintain a largely modified (class D) category; and
- The buffer widths for the systems is 15 m.

The National Web based Environmental Screening Tool has characterised the aquatic theme sensitivity for the area as "Low" sensitivity, with suspected wetland areas and rivers characterised as "Very High" sensitivity. The overall sensitivity for the delineated resources is presented below, with supporting justifications:

Screening Tool Theme	Screening Tool	System	Specialist	Tool Validated or Disputed by Specialist - Reasoning

Aquatic Biodiversity Theme	Low	-	Low	Confirmed – No natural water resources located within the BESS / PAOI.
	Very High	-	Medium	Disputed – The system is of moderate ecological importance and sensitive. The risks to the system are negligible and all direct risks can be avoided.

4.1 Linear Activity Impact

It is stated that the aquatic biodiversity beneath the overhead powerlines can be returned to the current state within two years of construction, with the implementation of management measures. The residual impact is negligible.

The proposed access road constitutes the upgrade of an existing route, with no wetland areas identified proximal to the route. The residual impact is negligible.

4.2 Specialist Statement

The proposed project area will have an acceptable negative impact on the aquatic biodiversity of the area. Due to the limited footprint disturbance of the powerline, the hydrology of the systems will remain largely unaltered. The development will not alter the integrity (class D) of the system, and maintenance of this category is recommended for the project. The proposed development can be favourably considered for authorisation.

4.3 Statement Conditions

The conclusion of this assessment on the acceptability of the proposed project and the recommendation for its approval is subject to the prescribed mitigation measures provided herein.

5 References

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Nel JL, Murray KM, Maherry AM, Petersen CP, Roux DJ, Driver A, Hill L, Van Deventer H, Funke N, Swartz ER, Smith-Adao LB, Mbona N, Downsborough L and Nienaber S. 2011. Technical Report for the National Freshwater Ecosystem Priority Areas project. WRC Report No. K5/1801.

Ollis DJ, Snaddon CD, Job NM, and Mbona N. 2013. Classification System for Wetlands and other Aquatic Ecosystems in South Africa. User Manual: Inland Systems. SANBI Biodiversity Series 22. South African Biodiversity Institute, Pretoria.

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6 Appendix Items

6.1 Appendix A – Specialist Declaration of Independence

I, Andrew Husted, 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.

Andrew Husted

Freshwater Ecologist

The Biodiversity Company

February 2024

6.2 Appendix B – Specialist CVs

Andrew Husted

M.Sc Aquatic Health (*Pr Sci Nat*)

Cell: +27 81 319 1225
Email: andrew@thebiodiversitycompany.com
Identity Number: 7904195054081
Date of birth: 19 April 1979

Profile Summary

Working experience throughout South Africa, West and Central Africa and also Armenia & Serbia.

Specialist experience in exploration, mining, engineering, hydropower, private sector and renewable energy.

Experience with project management for national and international multi-disciplinary projects.

Specialist guidance, support and facilitation for the compliance with legislative processes, for in-country requirements, and international lenders.

Specialist expertise include Instream Flow and Ecological Water Requirements, Freshwater Ecology, Terrestrial Ecology and also Ecosystem Services.

Areas of Interest

Sustainability and Conservation.

Instream Flow and Ecological Water Requirements.

Publication of scientific journals and articles.

Key Experience

- Familiar with World Bank, Equator Principles and the International Finance Corporation requirements
- Environmental, Social and Health Impact Assessments (ESHIA)
- Environmental Management Programmes (EMP)
- Ecological Water Requirement determination experience
- Wetland delineations and ecological assessments
- Rehabilitation Plans and Monitoring
- Fish population structure assessments
- The use of macroinvertebrates to determine water quality
- Aquatic Ecological Assessments
- Aquaculture

Country Experience

Botswana, Cameroon

Democratic Republic of Congo

Ghana, Ivory Coast, Lesotho

Liberia, Mali, Mozambique

Nigeria, Republic of Armenia,

Senegal, Serbia, Sierra Leone, South Africa

Tanzania

Nationality

South African

Languages

English – Proficient

Afrikaans – Conversational

German - Basic

Qualifications

- MSc (University of Johannesburg) – Aquatic Health.
- BSc Honours (Rand Afrikaans University) – Aquatic Health
- BSc Natural Science
- Pr Sci Nat (400213/11)
- Certificate of Competence: Mondi Wetland Assessments
- Certificate of Competence: Wetland WET-Management
- SASS 5 (Expired) – Department of Water Affairs and Forestry for the River Health Programme
- EcoStatus application for rivers and streams