63 Wessel Road, Rivonia, 2128 PO Box 2597, Rivonia, 2128 South Africa
Tel: +27 (0) 11 803 5726 **Fax:** +27 (0) 11 803 5745 **Web:** www.gcs-sa.biz

Draft Basic Assessment Report

Ummbila Emoyeni Borrow Pit Application,

Version – Draft for Public Review

September 2024

Applicant: Stefanutti Stock (Pty) Ltd

GCS Project Number: 23-0766

DMRE Reference: MP30/5/1/3/2/14646MP

GCS (Pty) Ltd. **Reg No:** 2004/000765/07 Est. 1987
Offices: **Johannesburg** (Head Office) | Durban | Gaborone | Lusaka | Maseru | Windhoek | Ostrava
Directors: AC Johnstone (CEO) | H Botha | W Sherriff (Financial) | N Marday (HR)

mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

BASIC ASSESSMENT REPORT And ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED).

NAME OF APPLICANT: Stefanutti Stock (Pty) Ltd

TEL NO: 078 456 3420

FAX NO:

POSTAL ADDRESS: PO Box 724, Melville

PHYSICAL ADDRESS: Protec Park, cnr Zuurfontein Avenue and Oranjeriver Drive, Chloorkop

FILE REFERENCE NUMBER SAMRAD: MP30/5/1/3/2/14646MP

FILE REFERENCE NUMBER SAMRAD: MP30/5/1/3/2/14646MP

1. IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002 as amended), the Minister must grant a prospecting or mining right if among others the mining "will not result in unacceptable pollution, ecological degradation or damage to the environment".

Unless an Environmental Authorisation can be granted following the evaluation of an Environmental Impact Assessment and an Environmental Management Programme report in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

In terms of section 16(3)(b) of the EIA Regulations, 2014, any report submitted as part of an application must be prepared in a format that may be determined by the Competent Authority and in terms of section 17 (1) (c) the competent Authority must check whether the application has taken into account any minimum requirements applicable or instructions or guidance provided by the competent authority to the submission of applications.

It is therefore an instruction that the prescribed reports required in respect of applications for an environmental authorisation for listed activities triggered by an application for a right or a permit are submitted in the exact format of, and provide all the information required in terms of, this template. Furthermore please be advised that failure to submit the information required in the format provided in this template will be regarded as a failure to meet the requirements of the Regulation and will lead to the Environmental Authorisation being refused.

It is furthermore an instruction that the Environmental Assessment Practitioner must process and interpret his/her research and analysis and use the findings thereof to compile the information required herein. (Unprocessed supporting information may be attached as appendices). The EAP must ensure that the information required is placed correctly in the relevant sections of the Report, in the order, and under the provided headings as set out below, and ensure that the report is not cluttered with un-interpreted information and that it unambiguously represents the interpretation of the applicant.

2. Objective of the Basic Assessment Process

The objective of the basic assessment process is to, through a consultative process─

(a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;

(b) identify the alternatives considered, including the activity, location, and technology alternatives;

(c) describe the need and desirability of the proposed alternatives,

(d) through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage , and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on the these aspects to determine:

(i) the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
(ii) the degree to which these impacts—

(aa) can be reversed;

(bb) may cause irreplaceable loss of resources; and

(cc) can be managed, avoided or mitigated;

(e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to—
(i) identify and motivate a preferred site, activity and technology alternative;

(ii) identify suitable measures to manage, avoid or mitigate identified impacts; and

(iii) identify residual risks that need to be managed and monitored.

3. Contact Person and correspondence address

a) Details of

i) Details of the EAP

Name of The Practitioner: Rona Schröder

Tel No.: 011 803 5726

Fax No. 011 803 5745

e-mail address: ronas@gcs-sa.biz

ii) Expertise of the EAP.

(1) **The qualifications of the EAP**
(with evidence).

Rona Schröder holds a B.Sc (Hons) in Environmental Analyses and Management and a B.Sc in Geology and Management.

(2) **Summary of the EAP's past experience**.
(In carrying out the Environmental Impact Assessment Procedure)

Rona has over 10 years's experience within the environmental management, water and mining field and is aimed at delivering the required environmental services for each client.

Rona has experience in the environmental fields as an Environmental Assessment Practitioner as well as having worked in the mining field on-site ensuring environmental compliance for several mining and processing sites.

She has dealt with projects in the mining, municipal, farming, electricity generation, telecommunications and water industries. She has been involved with environmental projects from site screening and feasibility, environmental application, writing of Environmental Management Programmes (EMPr), writing of technical reports all the through to Stakeholder Engagement Processes and completing of projects up to issuing authorization permits and licenses.

- Proposal Writing and project management

- Stakeholder Management and Engagement
- Government institution and authority liaison
- Water Use Licence Applications
- Environmental Impact Assessment / Basic Assessments
- Environmental Compliance Officer
- Public Participation Processes
- Environmental Compliance Auditing
- Mining Environmental Projects and Licensing
- Environmental Screening and Site Evaluations
- Environmental Training

b) Location of the overall Activity.

The Ummbila Emoyeni Borrow Pit Project is located on Portion 9 of the Farm Sukkelaar 421 IS some 15km from Bethal in the Mpumalanga Province. The site is located in the Lekwa Local Municipality within the Gert Sibande District Municipality.

Farm Name:	Farm Sukkelaar 421 IS Portion 9
Application area (Ha)	4.9Ha
Magisterial district:	Standerton Magisterial District
Distance and direction from nearest town	The application area is located approximately 15km to the south of the town of Bethal and 19km from Morgenzon.
21 digit Surveyor General Code for each farm portion	T0IS00000000042100009

c) Locality map

(show nearest town, scale not smaller than 1:250000).

Refer to Figure 3-1 for the Locality Map.

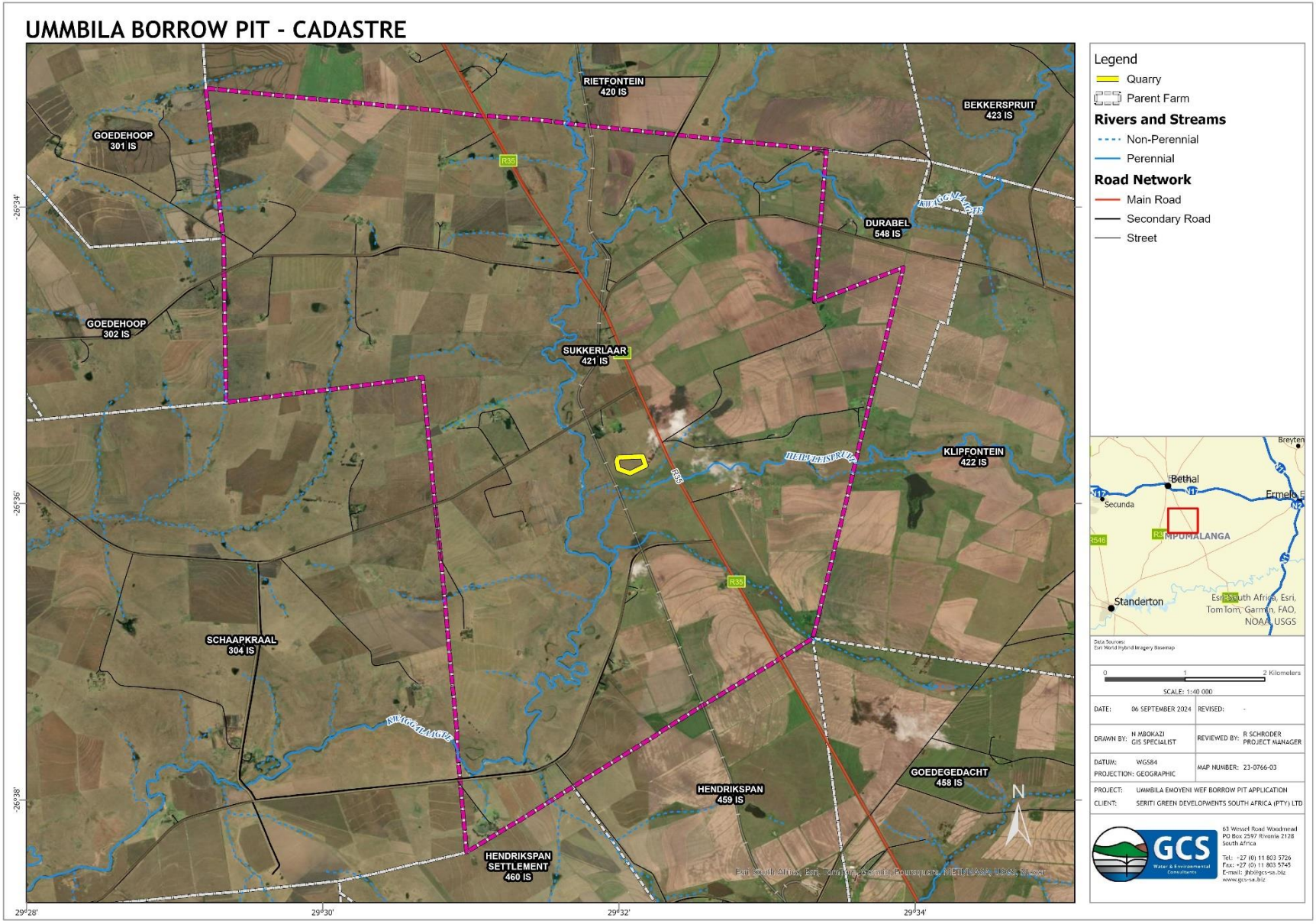


Figure 3-1: Locality Map of 1: 40 000 Scale

d) Description of the scope of the proposed overall activity.

Provide a plan drawn to a scale acceptable to the competent authority but not less than 1: 10 000 that shows the location, and area (hectares) of all the aforesaid main and listed activities, and infrastructure to be placed on site

Stefanutti Stocks (Pty) Ltd proposes to establish a borrow pit to be used to abstract construction aggregate for the construction of the Seriti Green Developments South Africa (Pty) Ltd Ummbila Emoyeni Wind Energy Facility, between Bethal and Morgenzon in the Mpumalanga Province.

The site selected would provide the correct quality and quantity of gravel material needed, also the site is located close to the construction site where the material will be used, this reduces the distance that the hauling trucks will need to travel and a reduction in travel time and costs. The site is easily accessible and as such no additional long access roads are required, only a separate entrance from the farmer.

The site will consist of the following components:

- The borrow pit;
- Topsoil stockpile area;
- Generator and fuel storage area;
- Crushing area;
- Spoils area.

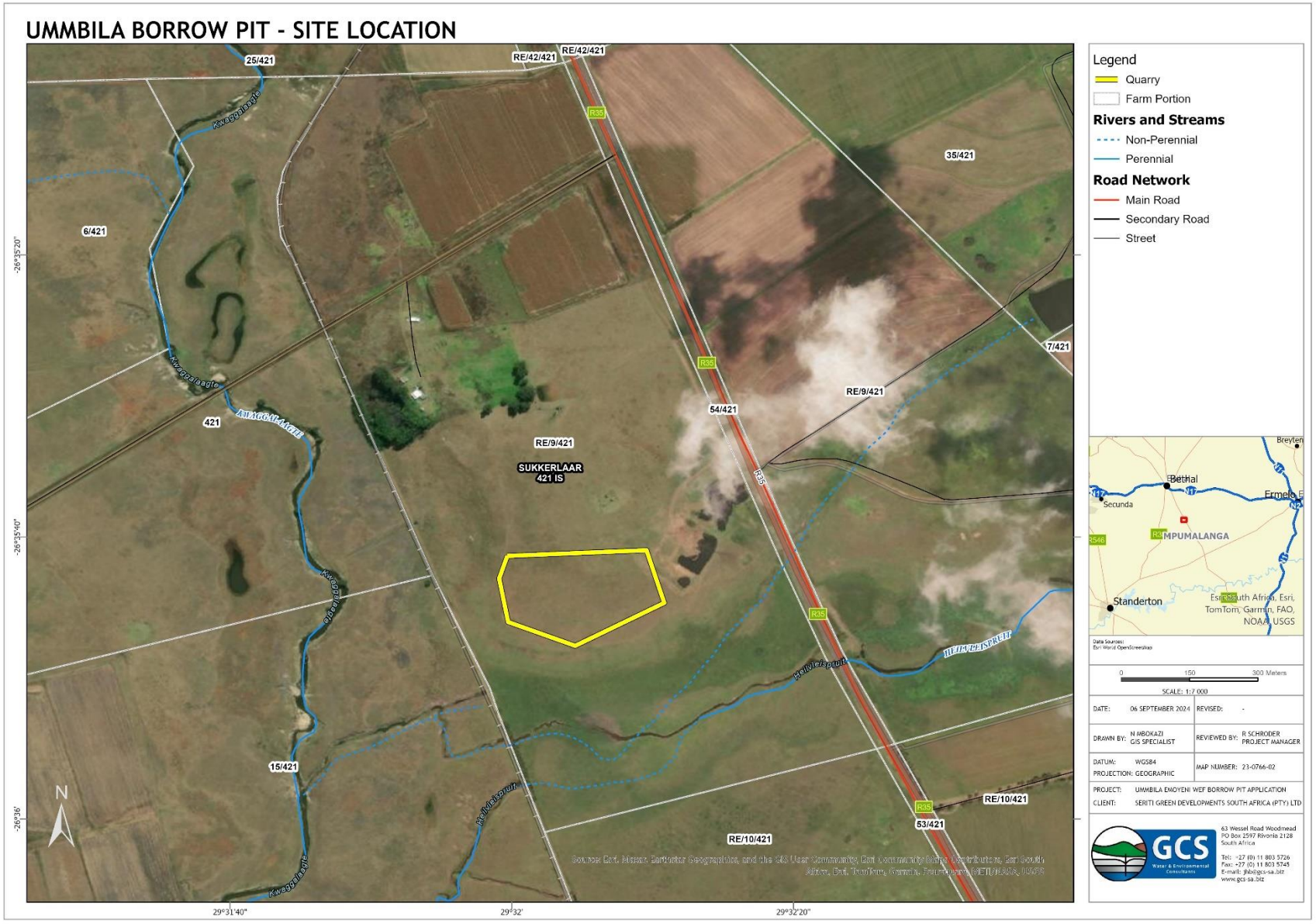


Figure 3-2: Site Location

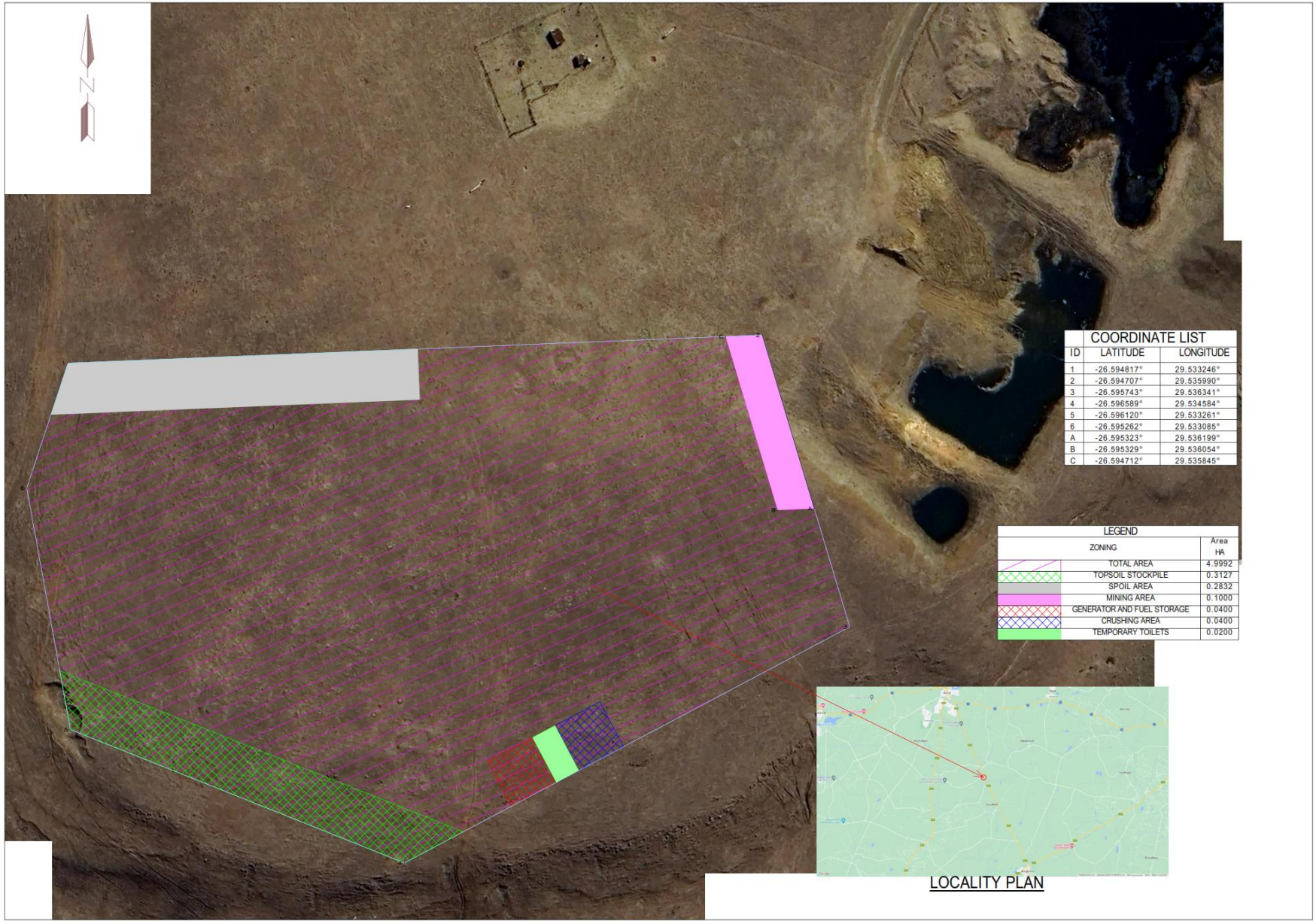


Figure 3-3: Site Layout Plan.

(i) Listed and specified activities

NAME OF ACTIVITY **(E.g. For prospecting -** drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route **etc…etc…etc** **E.g. for mining**,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines,	**Aerial extent of the Activity Ha or m²**	**LISTED ACTIVITY Mark with an X where applicable or affected.**	**APPLICABLE LISTING NOTICE (*GNR 544, GNR 545 or GNR 546)***
For mining – Excavation, possible blasting for a borrow pit with associated infrastructure such as offices, stockpiles, ablution facilities, etc. for construction material for the Ummbila Emoyeni Wind Energy Facility.	4.9 Ha	X	GN R327, Activity 21 Listing Notice 1
Clearance of natural vegetation for the Excavation, possible blasting for a borrow pit with associated infrastructure such as offices, stockpiles, ablution facilities, etc. for construction material for the Ummbila Emoyeni Wind Energy Facility	4.9 Ha	X	GN R327 Activity 27 Listing Notice 1

(ii) (ii) Description of the activities to be undertaken

(Describe Methodology or technology to be employed, including the type of commodity to be prospected/mined and for a linear activity, a description of the route of the activity)

The proposed project involves the development of a borrow pit and associated infrastructure to supply construction materials for a new Ummbila Emoyeni Wind Energy Facility. The wind energy facility, which will be situated closely to the proposed borrow pit, aims to generate renewable energy through the installation of wind turbines and is planned to provide power to the Seriti Coal Mines and reduce the reliance on the National Grid for power supply. To support the construction of infrastructure such as access roads, turbine foundations, and other necessary facilities, a borrow pit will be established to extract aggregate materials.

The following activities are specific to the borrow pit:

Construction/Pre-mining:

- Engage with landowners who may be affected by the operations.
- The contractor will verify the mining process and create a mining method statement.
- The contractor will prepare a Mining Plan outlining the layout for mining activities and facilities, including fencing, access routes, aggregate and topsoil stockpiles,

storage containers, crushing and screening areas, office and support buildings, haul roads, and overburden placement. (Refer to Appendix 3 for a site layout plan.)
- Assess and manage site drainage and stormwater by constructing sediment retention basins and redirecting up-slope water around the mining area.
- Prepare the site through clearing and grubbing.
- Remove the topsoil.
- Install fencing around the mining area.
- Set up temporary areas for fuel storage, equipment maintenance, and other facilities.

Mining - Extracting Construction Materials:

- Extract the aggregate material for use in road construction.
- Conduct blasting if needed, with prior notification to affected landowners.
- Regulate the depth and scope of the borrow pit, including side slopes and the floor of the mined area.
- Safely store topsoil and overburden material in temporary stockpiles for future rehabilitation.
- Process the extracted material by crushing and screening it for earthworks.
- Load the material into tipper trucks and transport it to the designated road sections.
- Use inert and spoil material for landscaping and rehabilitating the borrow pit.
- Implement stormwater management measures to address water ponding, especially during summer rainfall.

Post-mining:

- Grade the site.
- Remove all structures and infrastructure related to mining activities.
- Stabilize, restore, and rehabilitate the borrow pit.
- Develop and execute a Closure Plan for the borrow pit.

Mining Equipment:

- Excavators
- Bulldozers and front-end loaders
- Tipper trucks
- Graders
- Water trucks
- Low-bed trucks (for transporting machinery on and off the site)

e) Policy and Legislative Context

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT. (E.g. In terms of the National Water Act a Water Use License has/ has not been applied for)
Environmental Impact Assessment Regulations, 2014	Guideline for the application process	Guideline for the Impact Assessment and the document requirements
Mineral and Petroleum Resource Development Act 28 of 2002. Section 27 requirements for Mining Permit.	The borrow pit	A Mining Permit is being applied for the Borrow Pit
National Environmental Management Act, 19989 (Act 107 of 1998),	The borrow pit and associated infrastructure	Listed activities which require the need for an Environmental Authorisation. Listing Notice 1, Activities 21 and 27 are triggered which require a Basic Assessment process to be followed.
National Water Act, 1998 (Act 36 of 1998)	The borrow pit and associated infrastructure	A General Authorisation is required for Section 21(c) & (i) for working within 500m of a wetland.

f) Need and desirability of the proposed activities.

(Motivate the need and desirability of the proposed development including the need and desirability of the activity in the context of the preferred location).

The Need for this Borrow Pit for the Ummbila Emoyeni Borrow Pit includes:

a) Material Supply for the Wind Energy Facility:

- Foundation/ structures construction: Wind turbine foundations require significant amounts of aggregate materials such as gravel, sand, and crushed rock. The borrow pit will provide these essential materials.
- Access roads and other infrastructure: The construction of access roads, crane pads, offices and other infrastructure for the wind energy facility also requires large quantities of aggregate.

b) Cost Efficiency:

- Reduced Transportation Costs: Having a nearby borrow pit reduces the need for transporting materials from distant sources, which can significantly lower transportation costs and logistical challenges.
- Project Budget Management: Access to a local source of materials helps in controlling costs and budgeting effectively for the wind energy facility project.

c) Project Timeliness:

- Minimised Delays: Localising material supply through a borrow pit helps in maintaining project timelines by reducing delays associated with material procurement and transportation.
- Availability: Ensures a steady and reliable supply of materials, avoiding potential interruptions in the construction schedule.

The desirability of a Borrow Pit for the wind energy facility includes the following aspects:

a) Economic Benefits:

- Job Creation: The development and operation of a borrow pit can create local employment opportunities, contributing to the regional economy.
- Economic Growth: A local source of materials supports the broader economic development of the area, potentially stimulating further infrastructure and industrial activities.

b) Environmental Management:

- Sustainable Practices: With proper planning and management, a borrow pit can be operated in an environmentally responsible manner, minimizing impacts on the surrounding ecosystem.
- Rehabilitation: The site can be rehabilitated after closure to restore or enhance local habitats, contributing positively to future land use.

c) Community and Stakeholder Relations:

- Local Benefits: Engaging with local communities and stakeholders about the borrow pit can help address concerns and ensure that the project aligns with community interests.
- Transparency: Open communication and involvement in the planning process creates positive relationships and build trust with stakeholders.

d) Logistical Advantages:

- Accessibility: A nearby borrow pit improves logistical efficiency for transporting materials to the construction site.
- Operational Collaboration: Integrating the borrow pit operation with the wind energy facility construction can streamline workflows and operational coordination.

e) Regulatory Compliance:

- Permits and Approvals: Securing necessary permits and complying with local regulations for a borrow pit ensures that the project meets legal and environmental standards.
- Mitigation Measures: Implementing mitigation measures and monitoring systems addresses potential environmental impacts, making the project more acceptable to regulators and the public.

g) Motivation for the overall preferred site, activities and technology alternative.

Selecting the preferred site was based on the following aspects and decisions. There are many factors to take into account such as:

a) Location – Required a site that is close enough to the Ummbila Emoyeni Wind Energy Facility that would keep transport costs and material costs as low as possible. The preferred borrow pit site is close enough to the wind energy facility to be able to reduce the transportation of materials from other suppliers.

d) Landowner consent – It is crucial to obtain landowner consent for the borrow pit prior to starting with the authorization process to ensure that the project will be able to realise once the approvals are in place. Landowner consent has been obtained for the preferred site.

e) Material – The geological structures and available rock and aggregate play a role in the site selection, as specific aggregate is required for the construction of the foundations for the wind turbines, etc. The preferred site has the correct aggregate required for the construction.

f) Cost – The cost of materials is an important part of the budgeting and feasibility of a project. Reducing the costs of materials and transportation of materials is a major contributor to the feasibility of a project. Due to the location of the wind energy facility, the transportation of materials from depots increases the costs of the project and makes it less feasible. Having the materials excavated in close proximity to the site makes the project more feasible.

g) Accessibility – The proposed site is close to the R35 to be able to avoid lengthy access to the site and reduce costs for access road construction.

h) Timing – The construction of the Wind Energy Facility is tarting and the requirements for of the aggregate for construction is urgent therefore the application for the mining Permit is being undertaken now.

h) Full description of the process followed to reach the proposed preferred alternatives within the site.

NB!! – This section is about the determination of the specific site layout and the location of infrastructure and activities on site, having taken into consideration the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout.

i) Details of the development footprint alternatives considered.

With reference to the site plan provided as Appendix 4 and the location of the individual activities on site, provide details of the alternatives considered with respect to:

a) the property on which or location where it is proposed to undertake the activity;
b) the type of activity to be undertaken;
c) the design or layout of the activity;
d) the technology to be used in the activity;
e) the operational aspects of the activity; and
f) the option of not implementing the activity.

a) the property on which or location where it is proposed to undertake the activity;

No property alternative has been considered as the specific aggregate material needed for the construction is located on the property, landowner consent has been provided and the property is located close enough to the Wind Energy Facility to make the material extraction feasible.

b) the type of activity to be undertaken

The type of activity alternative is not applicable, as specific construction material is required for the construction of the Wind Energy Facility.

c) the design or layout of the activity;

The design layout has been considered with different layouts. The proposed layout has been chosen as it would have the optimum for cost effectiveness and to reduce the footprint and impact area.

d) the technology to be used in the activity;

Due to the fact that the borrow pit will be supplying aggregate material for the Ummbila Emoyeni Wind Energy Facility, the cost and machinery used need to be considered to ensure the cost of material is kept to a minimum. It is therefore crucial to keep machinery and technology to be cost-effective and to a minimum.

e) the operational aspects of the activity; and

No alternative operational aspects have been considered, as the applicant is an operational specialist and knows the operational requirements.

f) the option of not implementing the activity.

The option to not implement the activity will affect the construction and development of the Ummbila Emoyeni Wind Energy Facility. The Emoyeni Wind Energy Facility is a Strategic Infrastructure Project so the borrow pit is an important key to the development of the facility.

ii) Details of the Public Participation Process Followed

Describe the process undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings. (Information to be provided to affected parties must include sufficient detail of the intended operation to enable them to assess what impact the activities will have on them or on the use of their land.

Regulations 41 to 44 of the EIA Regulations 2014 (GN R326), as amended, provide guidance for public engagement, which is a crucial legal need for an environmental authorisation process. This proposed project is following Regulation 40 of the EIA Regulations 2014 (GN R326, as amended), which outlines the objectives of public participation.

Advertisement and Notifications

The commencement of the Basic Assessment process and availability of the Draft Basic Assessment Report and Draft Environmental Programme (EMPr) was announced to the I&APs and authorities via the following:

- Site notices announcing the project and inviting the public to comment were placed at the borrow pit site on the 12th of September 2024.
- An advertisement announcing the proposed project and availability of the Draft Basic Assessment Report was advertised in The Bulletin Newspaper.
- The registered I&APs were notified by email about the availability of the Draft Basic Assessment Report on the 12th of September 2024.
- The Draft Basic Assessment Report is available at the Public Bethal Library and the GCS Consultants website using link https://www.gcs-sa.biz/public-documents/

See Appendix 5 for proof of PPP. 5.

iii) Summary of issues raised by I&APs

(Complete the table summarising comments and issues raised, and reaction to those responses)

** Complete record of communications and Issued Raised and Responses will be included in the Final Basic Assessment once the PPP has been completed.*

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
AFFECTED PARTIES					
Landowner/s	**X**				
Lawful occupier/s of the land					
Landowners or lawful occupiers on adjacent properties	**X**				
Municipal councillor	**X**				
Municipality	**X**				

Organs of state (Responsible for infrastructure that may be affected Roads Department,					
Eskom, Telkom, DWA e					
Communities					
Dept. Land Affairs					
Traditional Leaders					
Dept. Environmental Affairs					
Other Competent Authorities affected					
OTHER AFFECTED PARTIES					
INTERESTED PARTIES					

iv) The Environmental attributes associated with the alternatives.(The environmental attributed described must include socio-economic, social, heritage, cultural, geographical, physical and biological aspects)

(1) Baseline Environment

(a) Type of environment affected by the proposed activity.

(its current geographical, physical, biological, socio- economic, and cultural character).

Socio-Economic

The Lekwa Local Municipality, which forms part of the Gert Sibande District Municipality in Mpumalanga, is characterised by a diverse socio-economic environment. The municipal area is associated predominantly by agricultural and mining activities, with a high unemployment rate and several informal trading place. Some socio-economic aspects are set out below:

- **Economic Activities**
  - Agriculture: The region has a strong agricultural base, with farming being a significant economic activity. Major crops include maize, soybeans, and sunflowers, while cattle farming also plays a crucial role.
  - Mining: Historically, mining has been an important part of the local economy, though it's less dominant today compared to other sectors within the Lekwa Municipality.
  - Small and Medium Enterprises (SMEs): Local businesses and SMEs contribute to the economic landscape, offering services and goods to the community.

- **Employment and Income**
  - Employment Rate: The municipality faces challenges with unemployment, which is higher than the national average. Many residents engage in informal sector activities due to limited formal job opportunities.
  - Income Levels: The income levels vary significantly, with many households facing economic hardship. Poverty is a pressing issue, particularly in rural areas.

- **Infrastructure**
  - Transport: Infrastructure such as roads and transportation networks are critical for connecting rural areas with markets and services. Improvements and maintenance of these are ongoing concerns.
  - Utilities: Access to basic services like electricity, water, and sanitation varies, with some areas experiencing inadequate provision or service delivery challenges whereas the majority of the services are available in the formal areas.

- **Education and Skills Development**
  - Educational Facilities: There are several schools in the municipality, but the quality of education can be inconsistent, impacting skill development and future employment prospects.

- Skills Training: Initiatives for vocational training and skills development are in place but often limited, affecting the local workforce's ability to meet the demands of a changing job market.

- **Social Issues**
  - Healthcare: Access to healthcare services is a critical issue, with some areas lacking sufficient facilities and medical professionals.
  - Social Development: Efforts are made to address social issues like poverty and inequality, but challenges persist in achieving sustainable development.

- **Community and Culture**
  - Cultural Heritage: The municipality is home to a rich cultural heritage, with traditions and practices that influence community life.
  - Community Initiatives: Local community groups and organisations play a vital role in addressing social issues and promoting development through various programs and initiatives.

Overall, while the Lekwa Local Municipality has potential due to its agricultural and natural resources, it faces significant socio-economic challenges. Addressing issues like unemployment, poverty, and infrastructure development is crucial for developing sustainable growth and improving the quality of life for its residents.

Climate

Bethal experiences a subtropical highland climate with relatively mild temperatures throughout the year. The climate is characterised by distinct wet and dry seasons. Summers in Bethal area is typically warm with temperatures ranging from about 15°C to 28°C. Daytime temperatures can be quite high, especially in December and January. Winters are cooler, with temperatures ranging from about 4°C to 22°C. Frost can occur on colder nights, but daytime temperatures are generally mild and pleasant.

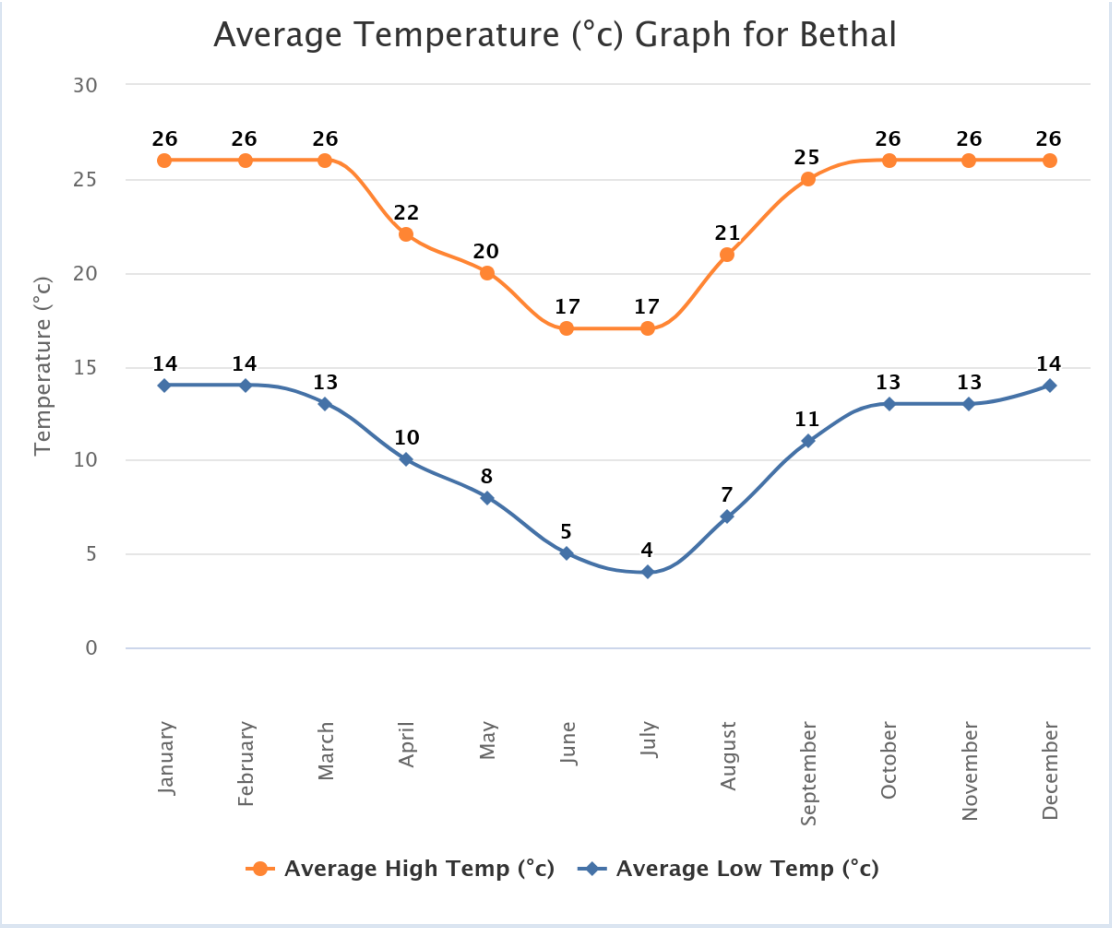


Figure 3-4: Average daily temperatures in the project area vicinity.

Rainfall

Bethal has a moderate rainfall pattern, with most precipitation occurring in the summer months. The town receives an average annual rainfall of approximately 600 to 800 mm.

- Wet Season: The summer months, from November to March, are the primary rainy season, with frequent afternoon thunderstorms and rainfall.
- Dry Season: The dry season extends from May to September, during which rainfall is significantly reduced. Rainfall during this period is minimal.

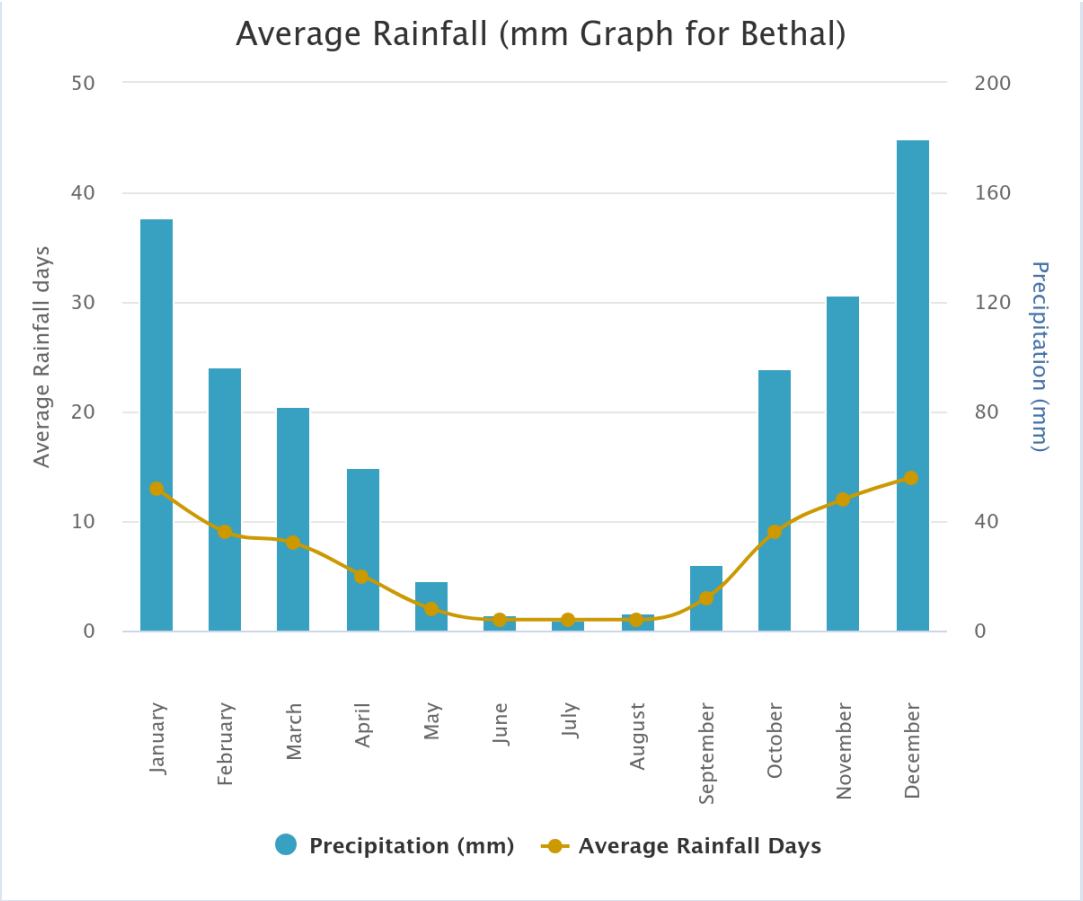


Figure 3-5: Average rainfall in the project area vicinity.

Wind

The wind patterns in Bethal are generally mild but can vary with the seasons.

- Summer Winds: During the summer months, the region can experience occasional gusty winds associated with thunderstorms and convective activity. Wind speeds are typically moderate.
- Winter Winds: In winter, the winds are usually light to moderate. However, cold fronts can occasionally bring stronger winds.

Vegetation Cover

The project site is located in the Soweto Highveld Grassland (Gm8) (Mucina and Rutherford, 2006) that extends between Ermelo and Johannesburg in the north, Perdekop in the southeast and the Vaal River in the south and westwards as far as Randfontein.

The vegetation on the project site consists of indigenous grasses dominated by *Aristida junciformis* (Ngongoni Grass), *Elionurus muticus* (Wire Grass), and *Tristachya leucothrix* (Hairy Trident Grass). A very small number of *Themeda triandra* (Red Grass) is present within the footprint of the project site.

The vegetation does not resemble a pristine stand of Soweto Highveld Grassland, but rather a transformed stand which contains limited species that occur within the vegetation type.

Important plant species

No important plant species occur within the project site.

Disturbances to the vegetation on the site

The presence of abovementioned grasses and in particular the presence of *Aristida junciformis* (Ngongoni Grass), indicates that the vegetation on the project site has been subjected to heavy overgrazing over time. This has resulted in the decreasing grass species composition within the area and a significant reduction in the climax species, *Themeda triandra* (Red Grass). *Themeda triandra* (Red Grass) is the most palatable grass species that will occur on the site and as such will be selectively grazed by livestock. This overgrazing results in a decrease in the presence of this grass species and the settlement of the more pioneering, unpalatable grasses.

(b) Description of the current land uses.

The land is currently used by the farmer as a grazing area for his cattle. See below Figure 3-6 for the current land use map.

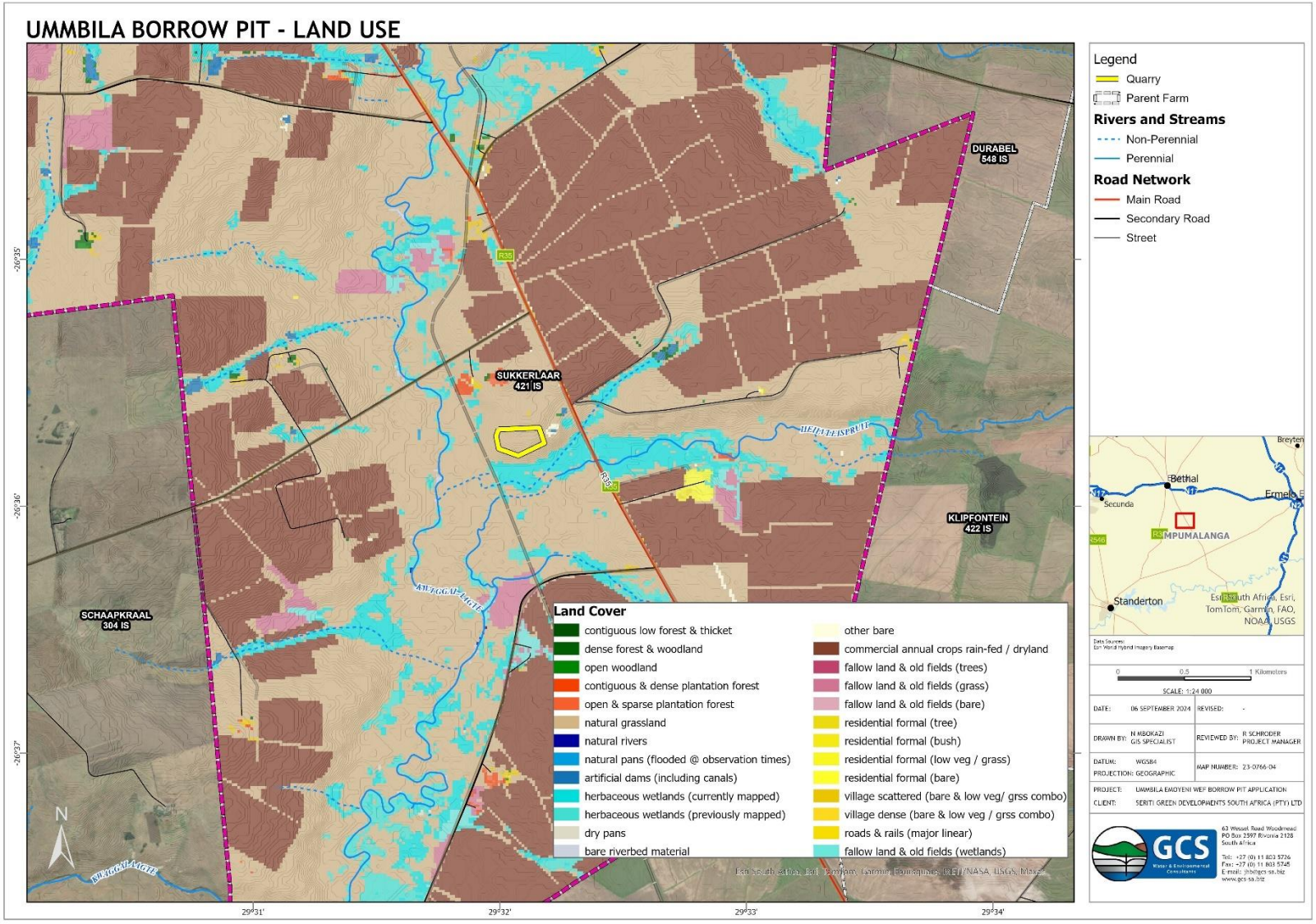


Figure 3-6: Current Land Use Map

(c) Description of specific environmental features and infrastructure on the site.

The area where the borrow pit is proposed is currently grassland that the farmer uses for cattle grazing. There are steep ridges towards the south and west of the borrow pit and towards the northeast of the pit there is remnants of a previous borrow pit that is currently being used as a watering area for the cattle. There are two worker houses located about 100m from the borrow pit and the farmhouse is situated approximately 350m from the site.

Figure 3-7: Photograph of the current environment at the proposed borrow pit location. (Taken 21 August 2024)

Figure 3-8: Photograph of the current environment at the proposed borrow pit location with the trucks on the R35 visible from the location. (Taken 21 August 2024)

(d) Environmental and current land use map.

(Show all environmental, and current land use features)

Land Use

Please refer to Figure 3-6 for the current Land Use Map.

Biodiversity Features

The Mpumalanga Biodiversity Conservation Plan (2014) is a dataset that contains the following layers: Ecological Support Areas (ESAs), land scape corridors, vegetation types, Critical Biodiversity Areas (CBAs), provincial conservation status and Protected Areas.

The dataset indicated the presence of the project within a CBA (Optimal) and an ESA. The total area CBA (Optimal) associated with the project is approximately 50ha in size with the ESA being approximately 97ha. The CBA (Optimal) area that occurs within the project site is approximately 0.98ha while the ESA area within the project site is approximately 4ha. The project site covers approximately 2% of the total CBA and approximately 4% of the total ESA falls within the associated project site.

The location and extent of the CBA and ESA is provided in Figure 10-3.

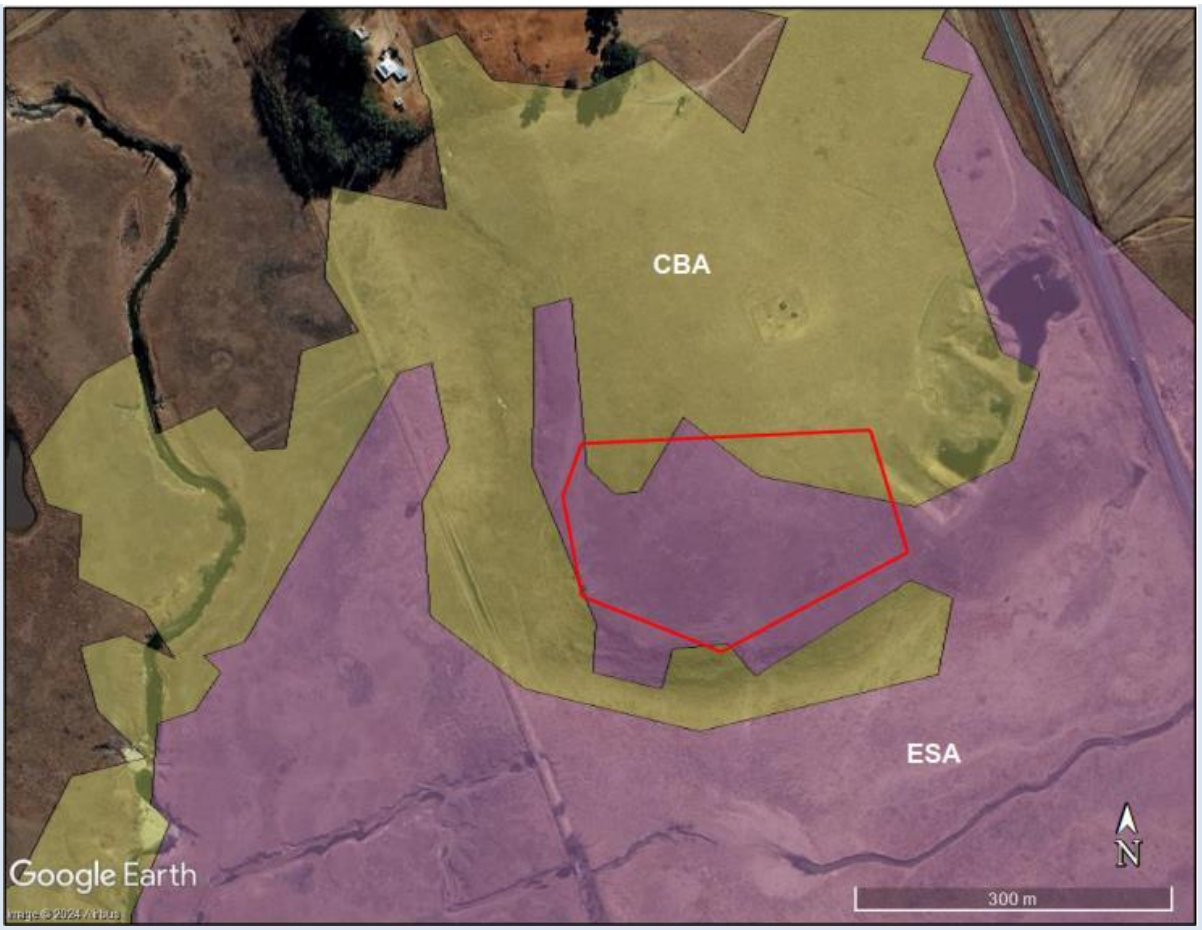
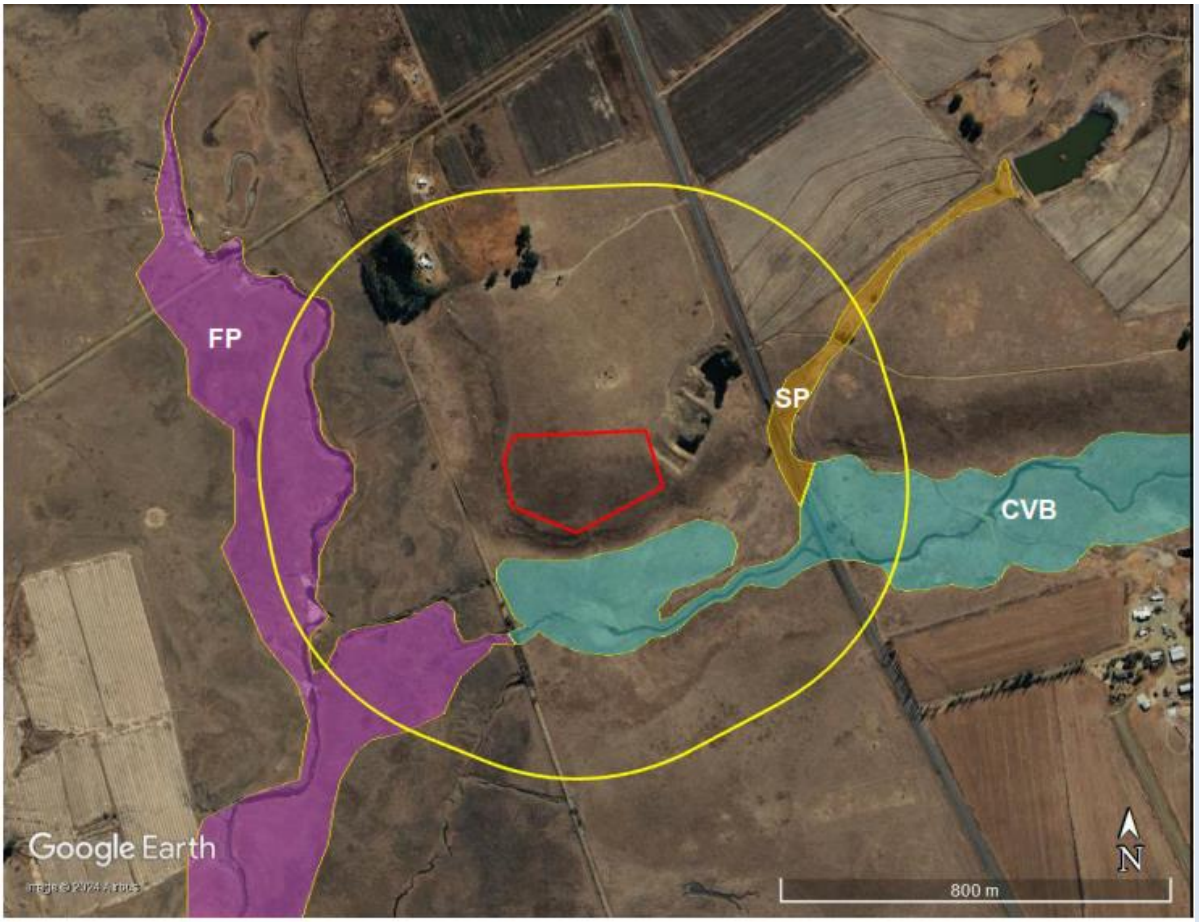


Figure 3-9: Location and extent of the ESA and CBA areas associated with the project site (shown in red) (Ecolink, 2024a)

Aquatic Features

The site assessment confirmed the absence of any natural wetland features within the boundaries of the project site. Furthermore, it identified three wetland features, one a Floodplain wetland (FP) associated with the Kwaggalaagte River, one a Channelled Valley Bottom wetland (CVB) associated with the Heilvleispruit and a Seep wetland (SP) within a 500m radius of the project site. The location of these features are indicated in Figure 3-10.



FP = Flood Plain; CVB = Channelled Valley Bottom; SP = Seep

Figure 3-10: Location of the wetland features identified during the field assessment (shown in green) within a 500m radius (shown in yellow) of the development site (shown in red) (Ecolink, 2024b)

v) Impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts

(Provide a list of the potential impacts identified of the activities described in the initial site layout that will be undertaken, as informed by both the typical known impacts of such activities, and as informed by the consultations with affected parties together with the significance, probability, and duration of the impacts. Please indicate the extent to which they can be reversed, the extent to which they may cause irreplaceable loss of resources, and can be avoided, managed or mitigated).

Please refer to Appendix 8 for the Environmental Impact Assessment conducted. The EAP considered all the environmental aspects that will be affected by the proposed development while considering the inputs from the Aquatic Specialist and Terrestrial Biodiversity Specialist.

vi) Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;

(Describe how the significance, probability, and duration of the aforesaid identified impacts that were identified through the consultation process was determined in order to decide the extent to which the initial site layout needs revision).

Possible impacts are identified through comments from I&APs, specialist reports, and from the EAP's experience. The assessment of potential impacts was addressed in a standard manner to ensure that a wide range of impacts were comparable. The ranking criteria and rating scales were applied to all specialist studies for this project. To enable a scientific approach to the determination of the environmental significance (importance), a numerical value is linked to each rating scale.

Clearly defined rating and rankings scales (Table 3-1**-** Table 3-6) were used to assess the impacts associated with the proposed activities. The impacts identified by each specialist study and through public participation were combined into a single impact rating table for ease of assessment.

Table 3-1: Severity or magnitude of impact

High	3
Moderate	2
Low	1
None	0

Table 3-2: Extent of activity

International	6
National	5
Regional	4
Local	3
Site	2
Footprint	1

Table 3-3: Duration of activity

Permanent / Beyond life of the activity	5
Long-term (more than 5 years)	4
Medium-term (18 months - 5 years)	3
Short-term (6-18 months)	2
Temporary (0-6 months)	1

Table 3-4: Reversibility of impacts

Low to non-reversible	3
Moderate	2
High	1

Table 3-5: Probability of impact

Definite (75% to 100%)	2
Probable (50% to 75%)	1
Improbable (0-less than 50%)	0

Table 3-6: Loss of Irreplaceable Resources

Yes	1
No	0

Each impact identified must be assessed in terms of probability (likelihood of occurring); the consequence of the impact (spatial scale, severity and duration); and the associated risk (impact significance).

Consequence was then determined as follows:

CONSEQUENCE = (Duration + Extent + Irreplaceable Loss) x Severity

The significance or risk of each identified impact was then based on the product of consequence and likelihood:

SIGNIFICANCE = Consequence x Probability

Impacts were rated as either of high, medium or low significance on the basis provided in **Table 3-7**. Each impact was also assessed in terms of the level to which there is an irreplaceable loss of resources and its degree of reversibility. The ratings as described in Table 3-7: Impact significance ratings..

Table 3-7: Impact significance ratings.

The nature of the Impact is can be rated as positive or negative impacts. And the significance of the impacts are rated accordingly.

Nature
+
-

Risk Rating	***Significance***	***Colour Code***
High (positive)	49 to 72	H
Medium (positive)	25 to 48	M
Low (positive)	1 to 24	L
Neutral	0	N
Low (negative)	-1 to - 24	L
Medium (negative)	-25 to -48	M
High (negative)	-49 to -72	H

The significance of an impact gives an indication of the level of mitigation measures required in order to minimise negative impacts and reduce environmental damage during the construction, operational and decommissioning phases. Suitable and appropriate mitigation measures, to ensure avoidance, management and mitigation of impacts, were identified for each of the potential impacts based on specialist recommendations and GCS expertise.

vii) The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected.

(Provide a discussion in terms of advantages and disadvantages of the initial site layout compared to alternative layout options to accommodate concerns raised by affected parties)

No alternative site has been investigated. Please refer to Appendix 8 for the Impact Assessment Tables.

viii) The possible mitigation measures that could be applied and the level of risk.

(With regard to the issues and concerns raised by affected parties provide a list of the issues raised and an assessment/ discussion of the mitigations or site layout alternatives available to accommodate or address their concerns, together with an assessment of the impacts or risks associated with the mitigation or alternatives considered).

Please refer to Appendix 8 for the Impact Assessment Tables.

ix) Motivation where no alternative sites were considered.

No alternative site has been considered, although alternative layouts, size and orientation have been considered. The reason for not considering other sites is due to the following crucial aspects:

1. Landowner consent has been received.
2. The required material is available at the site of the construction of the Wind Energy Facility.
3. The site is within close proximity of the Wind Energy Facility.
4. The site is close enough to the R35 that transportation of the material and access for workers is reduced.
5. There are no structures in the proposed borrow pit area.

x) Statement motivating the alternative development location within the overall site. **(Provide a statement motivating the final site layout that is proposed)**

Refer to Section ix for the motivation for the proposed site selection.

i) Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity. (Including (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process and (ii) an assessment of the significance of each issue and risk

and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.)

Please refer to Section vi and Appendix 8 for the Impact Methodology and the Impact Assessment Tables.

j) Assessment of each identified potentially significant impact and risk

(This section of the report must consider all the known typical impacts of each of the activities (including those that could or should have been identified by knowledgeable persons) and not only those that were raised by registered interested and affected parties).

NAME OF ACTIVITY **(E.g. For prospecting -** drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route **etc…etc…etc** **E.g. For mining**,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water	**POTENTIAL IMPACT** (Including the potential impacts for cumulative impacts) (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution	**ASPECTS AFFECTED**	**PHASE** In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)	**SIGNIFICANCE** if not mitigated	**MITIGATION TYPE** (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) E.g. Modify through alternative method. Control through noise control	**SIGNIFICANCE** if mitigated
Please refer to Appendix 8						

The supporting impact assessment conducted by the EAP must be attached as an appendix, marked **Appendix 8**

k) Summary of specialist reports.

(This summary must be completed if any specialist reports informed the impact assessment and final site layout process and must be in the following tabular form):-

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE BAR REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
Aquatic Impact Assessment	It is recommended that an Environmental Control Officer, who meets the requirements of the NEMA: EIA Regulations (2014) as amended, be appointed to conduct monthly audits of the construction phase of the project. An audit report must be completed for each monthly audit and be submitted to the relevant authority. A Stormwater Management Plan must be developed before the establishment of the borrow pit can commence. This management plan must make provision for the following key principles: (1) Diversion of all stormwater runoff from above (north) the borrow pit area around the borrow pit. (2) All stormwater that accumulates in the excavated areas within the borrow pit after rainfall events must be discharged in a controlled manner into the environment. The discharge must be controlled to ensure that the pre-development runoff does not exceed the post-development runoff. (3) Provision must be made for the capturing of any silt that may wash from the material stockpile areas to ensure that the silt is not released directly into the environment. (4) No uncontrolled stormwater runoff must be allowed to the south, east and west of the borrow pit area. (5) The stormwater management plan must be submitted for approval by the Seriti Green.	X	Appendix 8 Impact Assessment Tables

Aquatic Impact Assessment	(1) All plant and equipment that will be used in the construction activities must be inspected on a regular basis to ensure that any leaks are detected as soon as possible. (2) Any leaking plant and equipment must be removed from the construction site and only be allowed to return when the leaks have been addressed. (3) A Spill Contingency Plan must be in place for the duration of the construction phase that details the steps that needs to be taken if spills of various sizes are to occur. (4) No plant or equipment will be allowed to be parked overnight within a 40m buffer from the delineated edge of any aquatic feature.	X	Appendix 8 Impact Assessment Tables
Aquatic Impact Assessment	(1) In the event that any hydrocarbon materials are to be stored within the site during the operational phase, provision must be made that the storage facility is fully bunded in a bund that has a volume of 110% of the total volume of hydrocarbons that are stored. (2) The bund must be provided with a closable drainage tap for use when fluid needs to be drained from the bund. (3) The hydrocarbon storage facility may not be located within the 35m buffer from the delineated edge of any aquatic feature. If the edge is not known during the establishment of the storage feature, this must be delineated by an aquatic specialist before implementation. (4) A Spill Contingency Plan must be in place for the construction phase that details the management and mitigation actions that needs to be undertaken in the event of any spillages from the hydrocarbon storage facility.	X	Appendix 8 Impact Assessment Tables
Aquatic Impact Assessment	(1) All portable ablution facilities that will be used on site must be located 40m away from the edge of the delineated aquatic feature. If the edge is not clearly defined, this must be done by an aquatic specialist before implementation of the ablutions can take place. (2) The portable ablution facilities must be provided with sealed wells in which the sewage is collected. (3) The servicing of these portable ablution facilities must be conducted by a registered service provider who must dispose of the material at a Municipal facility. (4) A Spill Contingency Plan must be put in place to provide the appropriate management and mitigation measures to be implemented in the event of any spillages from these ablution facilities.	X	Appendix 8 Impact Assessment Tables

Terrestrial Biodiversity Assessment	An Alien Invasive Species Management Plan must be implemented for the duration of the operation and decommissioning of the borrow pit. The plan must include, as a minimum, measures for: • Scheduled monitoring of the site for the establishment of alien species; • Identification of alien species that do settle on the site; and • Identification and implementation of species appropriate alien invasive species management measures.	X	Appendix 8 Impact Assessment Tables
Terrestrial Biodiversity Assessment	Provision must be made in the Rehabilitation Plan for the borrow pit area for the following: • Collection and conservation of topsoil; • Grass species identification before removal to ensure that appropriate species are used in the re-vegetation; and • Continuous rehabilitation of the mined out areas within the borrow pit if appropriate.	X	Appendix 8 Impact Assessment Tables
Terrestrial Biodiversity Assessment	The following management and mitigation measures must be included into the Environmental Management Programme for the project: • All plant and equipment that make use of petrochemical substances must be checked leakages on a daily basis before operations commence. • All plant and equipment that are found to be leaking must be removed from the property and only returned once the leakages have been addressed. • If any petrochemical substances are stored on the property, this storage must be done on an impermeable surface in a bunded area that makes provision for 110% of volume of the substances that are stored. • All refuelling of plant and equipment must be conducted over a drip-tray. • If any plant or equipment is to be parked on the site, these must be parked within the demarcated borrow pit footprint that has been cleared. • If any spillages from plant or equipment occur, the spill must be immediately contained, the contaminated soils must be collected and bagged in impermeable bags and stored on site to be removed and disposed of by a registered service provider.	X	Appendix 8 Impact Assessment Tables

Attach copies of Specialist Reports as appendices 6 & 7

l) Environmental Impact Statement

(i) (i) Summary of the key findings of the environmental impact assessment;

The impacts and risks of the proposed development of the borrow pit were assessed in the Impact Significance Assessment Table in Appendix 10.

(ii) (ii) Final Site Map

Provide a map at an appropriate scale which superimposes the proposed overall activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers .Attach as **Appendix 4**

Refer to Appendix 4 for the Site Plan.

(iii) (iii)Summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;

Potential Negative Impacts

The potential negative impacts of the borrow pit project include vegetation removal, possible soil erosion, and surface and groundwater contamination from hydrocarbons and other mining activities. The noise and air quality impacts are expected to be low due to the low residential pollution around the site. The visual impact from the site would not affect residents or motorists as the site is located 250m from the R35. With the implementation of the proposed mitigation measures the impacts of the borrow pit has been found to be low.

Potential Possible Impacts

The potential possible impacts include the creation of job opportunities at the borrow pit and the construction of the Ummbila Emoyeni Wind Energy Facility which is a Strategic Infrastructure Project (SIP).

m) Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr;

Based on the assessment and where applicable the recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation.

Management Objection 1: Biodiversity Preservation

Ensure the borrow pit area stays within the site plan and demarcated area to minimise the disturbance of the biodiversity area.

Management Objective 2: Heritage Resources Preservation
Ensure the responsible Environmental Control Officer (ECO) should monitor all substantial excavations for fossil material. In the case of any significant fossil finds during construction (e.g. vertebrate teeth, bones, burrows, petrified wood, shells), these should be safeguarded - preferably in situ - and reported by the ECO as soon as possible to SAHRA (Tel: 021 202 8651), so that appropriate mitigation can be implemented.

Management Objective 3: Water Quality Preservation
Implementing the mitigation measures to ensure that the activity will not impact on the water resources.

n) Aspects for inclusion as conditions of Authorisation.

Any aspects which must be made conditions of the Environmental Authorisation

It is recommended that the following conditions be included in the authorisation:

- Should any deviations from the current layout be contemplated, such changes must be communicated to DMRE, and it must be determined whether the changes are allowable in terms of the EA or if amendment of the EA must be applied for first;
- No additional activities triggering the listed activities contained in the EIA Regulations may take place, unless EA is obtained first. Should any additional activities listed in terms of the EIA Regulations be planned on the site, the appropriate application(s) for authorisation must be lodged with the relevant authority.
- The impact mitigation measures contained in the EMPR accompanying this report must be implemented to minimise and/or mitigate the possible environmental impacts.

o) Description of any assumptions, uncertainties and gaps in knowledge.

(Which relate to the assessment and mitigation measures proposed)

- It is presumed that the data provided by the client or other expert consultants is accurate, unless explicitly stated otherwise.
- The evaluation of specific site impacts and proposed mitigation strategies is based on a one-time field survey and relevant specialist reports, reflecting the professional judgment of the assessor or specialist.
- The predicted impacts related to the project are based on probabilistic methods. The precision of these predictions relies heavily on the quality of available environmental data and the extent of understanding of the environmental features and their attributes.

p) Reasoned opinion as to whether the proposed activity should or should not be authorised

i) Reasons why the activity should be authorized or not.

This activity is linked to the Seriti Green Developments South Africa (Pty) Ltd Ummbila Emoyeni Wind Energy Facility which has been gazetted as a Strategic Infrastructure Project for the economy of the country.

ii) Conditions that must be included in the authorisation

Please refer to Section n for the proposed conditions to be included.

q) Period for which the Environmental Authorisation is required.

The applicant is applying for a Mining Permit which is valid for a period of 2 years, with the possible renewal of three more periods of one year each. It is therefore recommended that the Environmental Authorisation also be granted for a period of 5 years.

r) Undertaking

Confirm that the undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Basic assessment report and the Environmental Management Programme report.

Refer to Part B, Section 3 of the report for the complete undertaking of the BAR and EMP sections.

s) Financial Provision

State the amount that is required to both manage and rehabilitate the environment in respect of rehabilitation.

i) Explain how the aforesaid amount was derived.

Please refer to Appendix 9 rehabilitation financial provision of the proposed borrow pit.

ii) Confirm that this amount can be provided for from operating expenditure.

(Confirm that the amount, is anticipated to be an operating cost and is provided for as such in the Mining work programme, Financial and Technical Competence Report or Prospecting Work Programme as the case may be).

Please refer to Appendix 9 rehabilitation financial provision of the proposed borrow pit.

t) Specific Information required by the competent Authority

i) Compliance with the provisions of sections 24(4)(a) and (b) read with section 24 (3) (a) and (7) of the National Environmental Management Act (Act 107 of 1998). the EIA report must include the:-

(1) Impact on the S ocio-economic conditions of any directly affected person.

(Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as an **Appendix 3** .

The landowner will not be affected by the borrow pit, and has provided consent for the development.

See Appendix 3 for the Site Screening and Verification Report.

(2) Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act. **(**Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) with the exception of the national estate contemplated in section 3(2)(*i*)(vi) and (vii) of that Act, attach the investigation report as **Appendix 3,**

See Appendix 3 for the Site Screening and Verification Report.

u) Other matters required in terms of sections 24(4)(a) and (b) of the Act.

(the EAP managing the application must provide the competent authority with detailed, written proof of an investigation as required by section 24(4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives, as contemplated in sub-regulation 22(2)(h), exist. The EAP must attach such motivation as **Appendix 3)**.

Refer to Appendix 3 for the Site Screening and Verification Report.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

4. 1) Draft environmental management programme.

a) a) Details of the EAP*,*

(Confirm that the requirement for the provision of the details and expertise of the EAP are already included in PART A, section 1(a) herein as required).

Name of The Practitioner:	Rona Schröder
Tel No.:	011 803 5726
Fax No.	011 803 5745
E-mail address:	ronas@gcs-sa.biz

b) Description of the Aspects of the Activity

(Confirm that the requirement to describe the aspects of the activity that are covered by the draft environmental management programme is already included in PART A, section (1)(h) herein as required).

Stefanutti Stocks (Pty) Ltd proposes to establish a borrow pit to be used to abstract construction aggregate for the construction of the Seriti Green Developments South Africa (Pty) Ltd Ummbila Emoyeni Wind Energy Facility, between Bethal and Morgenzon in the Mpumalanga Province.

The site selected would provide the correct quality and quantity of gravel material needed, also the site is located close to the construction site where the material will be used, this reduces the distance that the hauling trucks will need to travel and a reduction in travel time and costs. The site is easily accessible and as such no additional long access roads are required, only a separate entrance from the farmer.

The site will consist of the following components:

- The borrow pit;
- Topsoil stockpile area;
- Generator and fuel storage area;
- Crushing area;
- Spoils area.

c) c) Composite Map

(Provide a map **(Attached as an Appendix**) at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers)

Refer to Appendix 4

d) Description of Impact management objectives including management statements

i. **Determination of closure objectives.** (ensure that the closure objectives are informed by the type of environment described)

The area is to be re-instated to an acceptable state, as close as possible to its natural state to allow for grazing activities.

ii. **Volumes and rate of water use required for the operation.**

Water would be brought to the site for use. No abstraction for use will be undertaken. Dewatering of the borrow pit might be required for the safety of the workers. Dewatered water would be placed in temporary storage dams and allowed to evaporate.

iii. Has a water use licence has been applied for?

The borrow pit might need to be dewatered should there be water seeping into the pit and is located within 500m of a wetland, therefore an application for a General Authorisation is being applied for Section 21(c) & (i) water uses are being applied. The final uses will be determined after consultation with the Department of Water and Sanitation.

iv) Impacts to be mitigated in their respective phases

Measures to rehabilitate the environment affected by the undertaking of any listed activity

ACTIVITIES **(E.g. For prospecting -** drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route **etc…etc…etc** **E.g. For mining**,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water	**PHASE** (of operation in which activity will take place. State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation,	**SIZE AND** **SCALE of disturbance** (volumes, tonnages and hectares or m^2)	**MITIGATION MEASURES** (describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)	**COMPLIANCE WITH** **STANDARDS** (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	**TIME PERIOD FOR** **IMPLEMENTATION** Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- .. Upon cessation of the individual activity or.
Please refer to Appendix 8 for the Impact Assessment and the Mitigation Measures for the proposed borrow pit.					

e) Impact Management Outcomes

(A description of impact management outcomes, identifying the standard of impact management required for the aspects contemplated in paragraph ();

ACTIVITY (whether listed or not listed). **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)**.	**POTENTIAL IMPACT** **(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc….etc…)**	**ASPECTS AFFECTED**	**PHASE** In which impact is anticipated **(e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)**	**MITIGATION TYPE** **(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc)** **E.g.** • **Modify through alternative method.** • **Control through noise control**	**STANDARD TO BE ACHIEVED** **(Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.**
Please refer to Appendix 8 for the Impact Assessment and the Mitigation Measures for the proposed borrow pit.					

f) Impact Management Actions

(A description of impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (c) and (d) will be achieved).

ACTIVITY whether listed or not listed. **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.).**	**POTENTIAL IMPACT** **(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc….etc…)**	**MITIGATION TYPE** **(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc)** **E.g.** • **Modify through alternative method.** • **Control through noise control** • **Control through management and monitoring** **Remedy through rehabilitation..**	**TIME PERIOD FOR IMPLEMENTATION** Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-.. Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.	**COMPLIANCE WITH STANDARDS** (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)
Please refer to Appendix 8 for the Impact Assessment and the Mitigation Measures for the proposed borrow pit.				

i) Financial Provision

(1) Determination of the amount of Financial Provision.

(a) Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under the Regulation.

The site closure objective is to rehabilitate the site so is as close to its natural state as before any construction/operations took place. Please refer to Appendix 9 for the rehabilitation financial provision of the proposed borrow pit.

(b) Confirm specifically that the environmental objectives in relation to closure have been consulted with landowner and interested and affected parties.

Please refer to the public participation proof in Appendix 5.

(c) Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main mining activities, including the anticipated mining area at the time of closure.

The goal for site closure is to restore the areas to a condition that closely resembles their original state prior to any operations. Rehabilitation efforts will be carried out concurrently with excavation activities and will involve reshaping and landscaping the slopes. A layer of topsoil will be applied to the disturbed and storage areas to create a suitable environment for seeding and to foster the re-establishment of local plant species. After the rehabilitation process is finalized, an independent Environmental Control Officer (ECO) will conduct a final inspection to verify adherence to environmental regulations.

(d) Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives.

Applying topsoil to the impacted area will create a conducive environment for seeding and provide a base for the growth of plants that originally thrived in the area, aiming to restore the site to a condition as close as possible to its natural state.

(e) **Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline**.

Please refer to Appendix 9 rehabilitation financial provision of the proposed borrow pit.

(f) **Confirm that the financial provision will be provided as determined.**

Please refer to Appendix 9 rehabilitation financial provision of the proposed borrow pit.

Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including

g) Monitoring of Impact Management Actions
h) Monitoring and reporting frequency
i) Responsible persons
j) Time period for implementing impact management actions
k) Mechanism for monitoring compliance

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Vegetation clearing	Loss of Indigenous and protected species	Site Demarcation	ECO will do the demarcation of the site with the contractor. The contractor should ensure construction/ operation is only in designated areas.	Daily inspections to ensure workers are only operating in designated areas.
Excavations	Loss of Heritage Resources	Visual inspections	Contractor/ contractor's environmental control officer shall monitor all substantial (>1 m deep) excavations for fossil material. In the case that any significant fossil finds during construction, they should be safeguarded and reported to SAHRA, so that appropriate mitigation (i.e. recording, sampling or collection) by a palaeontological specialist can be considered and implemented.	Daily inspections if excavation is more than 1 m deep. Report to SAHRA immediately
Use of excavator, TLB and Trucks	Soil and water contamination	Spill kits, drip trays	The contractor shall ensure drip trays are placed under stationary excavator, TLB, trucks at all times. Contractor's environmental control officer shall do a weekly inspection to ensure compliance. Independent ECO shall do monthly inspections to ensure compliance	Contractor/ contractor's environmental control officer: weekly inspections, record and remedy spills if Any Independent ECO shall do a monthly audit and inspect if oil spills were recorded and remedied correctly
Dust generation	Dust	Visual Observation	Contractor/ECO should monitor compliance with dust control.	Daily visual observations, work should be stopped under extreme windy conditions if visibility is compromised
Compliance Monitoring	Legal Requirements	Performance Assessment and Compliance Monitoring	The Contractor/ECO should conduct a monthly compliance audit on compliance with the conditions of the EA and Mining Permit as well as any other authorisations issued for the site.	Monthly Compliance Audits for the conditions of the Licenses, Permits and Authorisations.

l) Indicate the frequency of the submission of the performance assessment/ environmental audit report.

The Independent ECO will conduct annual performance assessment and management audit inspections and write up annual performance assessment and management audit reports which will be submitted to the DMRE.

m) Environmental Awareness Plan

(1) Manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work.

Toolbox talks will be held with employees to educate, inform and train employees regarding the environmental aspects.

(2) Manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment.

Inspection sheets, training and an incident register will be kept on site.

n) Specific information required by the Competent Authority
(Among others, confirm that the financial provision will be reviewed annually).

The development of the borrow pit is a critical component of the wind farm construction project, providing essential materials for the infrastructure needed to harness renewable energy. With careful planning, execution, and environmental stewardship, the project aims to support sustainable development while minimizing negative impacts.

2) UNDERTAKING

The EAP herewith confirms

a) the correctness of the information provided in the reports ☐

b) the inclusion of comments and inputs from stakeholders and I&APs ; ☐

c) the inclusion of inputs and recommendations from the specialist reports where relevant; ☐and

d) that the information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected. parties are correctly reflected herein. ☐

Signature of the environmental assessment practitioner:

Name of company:

Date:

-END-

Rona Schröder

Senior Environmental Assessment Practitioner

CORE SKILLS

- Project Management
- Environmental Impact Assessment
- Water Use Licencing
- Mining Environmental Compliance
- Environmental Compliance Auditing
- Environmental Strategic Action Plans

DETAILS

Qualifications

- B.Sc. (Hons) Environmental Analysis and Management - University of Pretoria (2011)
- B.Sc. Geology and Management - University of the Free State (2012)
- SHEilds (NEBOSH) International General Certificate in Occupational Health and Safety (2018)
- Certificate in Project Management for Strategic Advantage, University of Stellenbosch Business School (2017)

Professional Registrations

- Environmental Assessment Practitioners Association of South Africa (EAPASA) (2020/1149)
- Pr.Sci.Nat (120605), South African Council for Natural Scientific Professionals)
- International Association for Impact Assessors of South Africa (IAIASA)

Languages

- English
- Afrikaans

Countries Worked In

- South Africa
-

PROFILE

Rona has over 10 years's experience within the environmental management, water and mining field and is aimed at delivering the required environmental services for each client.

Rona has experience in the environmental fields as an Environmental Assessment Practitioner as well as having worked in the mining field on-site ensuring environmental compliance for several mining and processing sites.

She has dealt with projects in the mining, municipal, farming, electricity generation, telecommunications and water industries. She has been involved with environmental projects from site screening and feasibility, environmental application, writing of Environmental Management Programes (EMPr), writing of technical reports all the through to Stakeholder Engagement Processes and completing of projects up to issuing authorization permits and licenses.

- Proposal Writing and project management
- Stakeholder Management and Engagement
- Government institution and authority liaison
- Water Use Licence Applications
- Environmental Impact Assessment / Basic Assessments
- Environmental Compliance Officer
- Public Participation Processes
- Environmental Compliance Auditing
- Mining Environmental Projects and Licensing
- Environmental Screening and Site Evaluations
- Environmental Training

Previous Experience

Period	Employer	Position	Role/ Responsibility
2021 - 2023	Ikwezi Mining & Zinoju Coal & Zarbon Coal	Group Environment Manager	**I started as Group Environment Officer for Ikwezi Mining and Zarbon Coal and was promoted to Group Environment Manager for Ikwezi Mining, Zarbon Coal and Zinoju Coal. Here is a brief description of my responsibilities at Ikwezi Mining and Buffalo Coal.** • **Responsible for obtaining all relevant environmental authorizations and licenses for the current mining and plant operations as well as new projects;** • **Managing environmental compliance for opencast and underground mining operations as well as washing plants;** • **Departmental and community liaising on all environmental aspects;** • **Project planning, project management and process management for applications and specialist studies;** • **Developing and reviewing SOPs and COPs for environmental aspects;** • **Environmental Auditing, compliance tracking and reporting;** • **Environmental awareness program development and implementation;** • **Environmental monitoring and reporting;** • **Action plans development and implementation;** • **Guidance and implementation of Environmental Legislation;**
2019 - 2021	ACE Environmental Solutions	Head of Department: Environmental	• **Project Management; Proposal Writing for new projects; Company Marketing; Document Quality Assurance;** • **Environmental Authorizations, Water Use License Applications and Waste Management License Applications;** • **Client and Government Department Liaisons;** • **Environmental Compliance Auditing;** • **Managing of Environmental Impacts Assessments and developing implementable mitigation measures to reduce possible impacts;** • **Managing Stakeholder Engagement Processes for authorizations and licensing**

			applications; • Development and implementation of Environmental Management Plans (EMP); • Developing Protocols for environmental processes
2013 - 2019	Alta van Dyk Environmental Consultants	Environmental Consultant	• Project Management of multi-disciplinary teams; • Please note that our standard 2023 terms and conditions were sent out in December of 2022. • Environmental Compliance Auditing of Authorizations (ECO), Authorizations and Environmental Management Programmes (EMP); • Project Management for Environmental Processes under the National Environmental Management Act (NEMA), Mineral and Petroleum Resources Development Act (MPRDA) and National Water Act (NWA); • Environmental Authorization, Water Use License and Waste Management License Applications; • Proposal Writing for new projects; • Identification and assessments of Environmental Impacts Assessments and developing implementable mitigation measures to reduce possible impacts; • Report Writing and reviewing; Client and Government Department Liaisons; • Stakeholder Engagement Processes for authorizations and licensing applications; • Development and implementation of Environmental Management Plans (EMP); • Developing License Auditing Protocols for conducting environmental legal compliance audits, • Experience as a Data Controller for a large international company with several operations as part of their due diligence process and management system actions;
2013	**Prime Africa Consultants**	**Risk Assessment Matrix Developer**	• Developing a Multi Criteria Risk Assessment Matrix for site selection during Environmental Impact Assessments.

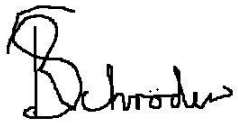
Project Experience

Year	Client	Project Description	Role/Responsibility
2013-2015	Pandora Platinum Mine	Environmental Impact Assessment and Water Use Licence Application	Environmental Practitioner
2014	Lonmin Plc	Baobab, Dwaalkop and Doornvlei External Water Use Licence Audits	Environmental Practitioner
2014-2019	Lonmin Plc	Marikana Operations Water Use Licence Audit	Environmental Practitioner
2015	Lonmin Plc	Precious Metal Refinery Water Use Licence Application	Environmental Practitioner
2015-2016	Lonmin Plc	Marikana Operations Water Use Licence Application	Environmental Practitioner
2016	Keaton Energy	Vanggatfontein Colliery Wash Plant Extension Authorisation	Environmental Practitioner
2016-2018	Keaton Energy	Vanggatfontein Colliery External Water Use Licence Audits	Environmental Practitioner
2016	Nqutu Local Municipality	Rural Electrification Project Ndodekhling-Shayiwe Small Scall Hydropower Plant	Environmental Practitioner
2016	Mhlontlo Local Municipality	Rural Electrification Project Kwa-Madiba Small Scale Hydropower Plant	Environmental Practitioner
2016	Anglo Thermal Coal	Licence and Permitting Database Development – For all Coal Operations	Data Controller
2016	Anglo Platinum	Licence and Permitting Database Development – For all Platinum Operations	Data Controller
2019	Ekurhuleni Metropolitan Municipality	Mooifontein Cemetery Extension Water Use Licence Application	Environmental Practitioner
2019	Blue Valley Golf Estate	Environmental Management Programme	Environmental Practitioner
2017	Nkomati Anthracite	Water Use Licence Audit Report	Environmental Practitioner
2017	Nkomati Anthracite	Basic Assessment Report	Environmental Practitioner
2017-2019	Lonmin Plc	Baobab, Dwaalkop and Doornvlei External Water Use Licence Audits	Environmental Practitioner
2018	Glencore	Chrome Plant Environmental Impact Assessment and Water Use Licence Application	Environmental Practitioner

2018-2019	Lonmin Plc	Precious Metal Refinery Water Use Licence Audit	Environmental Practitioner
2018-2019	Lonmin Plc	Marikana Operations Water Use Licence Application Amendment	Environmental Practitioner
2020-2021	Atlas Towers	Telecommunications Mast Basic Assessments	Project Manager and Environmental Practitioner
2021-2023	Ikwezi Mining	Opencast Mining and Coal Washing Plant Compliance	Group Environmental Manager
2022-2023	Buffalo Coal	Underground Mining and Coal Washing Plant Compliance	Group Environmental Manager

DECLARATION

I, Rona Schröder, hereby declare that the details furnished above are true and correct to the best of my knowledge and belief and I undertake to inform you of any changes therein, immediately. In case any of the above information is found to be false or untrue or misleading or misrepresenting, I am aware that I may be held liable for it.

Signature:  Date: 15/01/2024

Environmental Assessment Practitioners Association of South Africa

Registration No. 2020/1149

Herewith certifies that

Rona Schroder

is registered as an

Environmental Assessment Practitioner

Registered in accordance with the prescribed criteria of Regulation 15. (1) of the Section 24H Registration Authority Regulations (Regulation No. 849, Gazette No. 40154 of 22 July 2016, of the National Environmental Management Act (NEMA), Act No. 107 of 1998, as amended).

Effective: 01 March 2024

Expires: 28 February 2025

Chairperson

Registrar

SAQA
SOUTH AFRICAN QUALIFICATIONS AUTHORITY

SACNASP

South African Council for Natural Scientific Professions

herewith certifies that

Rona Wilma Schroder

Registration Number: 120605

is a registered scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)
in the following field(s) of practice (Schedule 1 of the Act)

Environmental Science (Professional Natural Scientist)

Effective **11 September 2019** Expires **31 March 2025**

Chairperson

Chief Executive Officer

To verify this certificate scan this code

28055749

Universiteit van Pretoria

Die Raad en die Senaat verklaar hiermee dat die graad

Baccalaureus Scientiae Honores

in

Omgewingsanalise en -bestuur

met al die regte en voorregte daaraan verbonde by geleentheid van 'n kongregasie van die Universiteit toegeken is aan

Rona Wilma Schroder

kragtens die Wet op Hoër Onderwys, 1997 en die Statuut van die Universiteit

Namens die Raad en die Senaat

C. de la Rey

Visekanselier en Rektor

Namens die Fakulteit
Natuur- en Landbouwetenskappe

Dekaan

Registrateur

2013-04-17

UNIVERSITY OF THE **FREE STATE**
UNIVERSITEIT VAN DIE **VRYSTAAT**
YUNIVESITHI YA **FREISTATA**

THIS IS TO CERTIFY THAT THE DEGREE HIERMEE WORD VERKLAAR DAT DIE GRAAD

Baccalaureus Scientiae

HAS BEEN CONFERRED UPON
TOEGEKEN IS AAN

SCHRÖDER, Rona Wilma

IN ACCORDANCE WITH THE STATUTES AND REGULATIONS OF THE UNIVERSITY. AS WITNESS OUR RESPECTIVE SIGNATURES AND THE SEAL OF THE UNIVERSITY BELOW.

NADAT AAN DIE STATUTE EN REGULASIES VAN DIE UNIVERSITEIT VOLDOEN IS. AS BEWYS DAARVAN PLAAS ONS ONS ONDERSKEIE HANDTEKENINGE EN DIE SEëL VAN DIE UNIVERSITEIT HIERONDER.

ENDORSEMENT: GEOLOGY AND MANAGEMENT
ENDOSSEMENT: GEOLOGIE EN BESTUUR

VICE- CHANCELLOR / VISEKANSELIER

DEAN / DEKAAN

REGISTRAR / REGISTRATEUR

BLOEMFONTEIN
2012-03-28
2007009976

nebosh

Management of international health and safety

A unit of the:
NEBOSH International General Certificate in Occupational Health and Safety
NEBOSH International Certificate in Construction Health and Safety
NEBOSH International Certificate in Fire Safety and Risk Management

Rona Wilma Schroder

achieved this unit on

12 November 2018

William Nixon
Chair

Ian Taylor
Chief Executive

Master log certificate No: IGC1/00447107/1026644
SQA Ref: UE48 04

The National Examination Board in Occupational Safety and Health
Registered in England & Wales No. 2698100
A Charitable Company
Charity No. 1010444

UNIVERSITEIT·STELLENBOSCH·UNIVERSITY
jou kennisvennoot · your knowledge partner

USB EXECUTIVE DEVELOPMENT LTD
USB BESTUURSONTWIKKELING BPK

Hiermee word gesertifiseer dat
It is hereby certified that

Rona Wilma Schroder

die volgende kursus suksesvol voltooi het
successfully completed the following course

PROJECT MANAGEMENT FOR STRATEGIC ADVANTAGE (ONLINE)

Number of Short Course Credits : 8

Vir die periode
Over the period

24/01/2017 - 10/03/2017

Prof Piet Naude
Director/Direkteur USB

Frik Landman
Chief Executive Officer
Hoof-Uitvoerende Beampte

USB Executive Development
University of Stellenbosch Business School

4497/55470

UMMBILA BORROW PIT - SITE LOCATION

Legend

- Quarry
- Farm Portion

Rivers and Streams

- Non-Perennial
- Perennial

Road Network

- Main Road
- Secondary Road
- Street

Data Sources:
Esri World OpenStreetMap

0 150 300 Meters

SCALE: 1:7 000

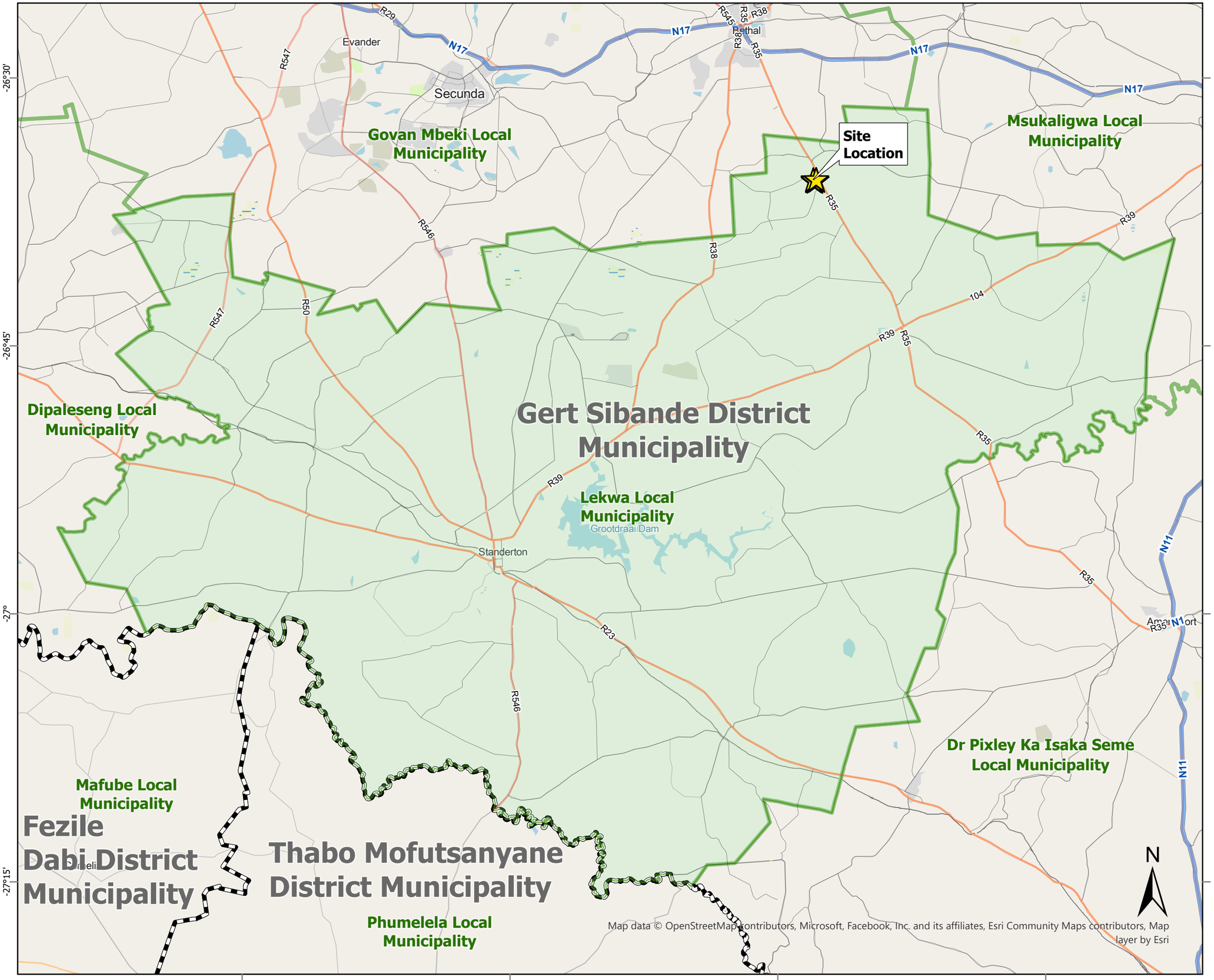
DATE:	06 SEPTEMBER 2024	REVISED:	-
DRAWN BY:	N MBOKAZI GIS SPECIALIST	REVIEWED BY:	R SCHRODER PROJECT MANAGER
DATUM: PROJECTION:	WGS84 GEOGRAPHIC	MAP NUMBER:	23-0766-02
PROJECT:	UMMBILA EMOYENI WEF BORROW PIT APPLICATION		
CLIENT:	SERITI GREEN DEVELOPMENTS SOUTH AFRICA (PTY) LTD		

GCS Water & Environmental Consultants

63 Wessel Road Woodmead
PO Box 2597 Rivonia 2128
South Africa

Tel: +27 (0) 11 803 5726
Fax: +27 (0) 11 803 5745
E-mail: jhb@gcs-sa.biz
www.gcs-sa.biz

UMMBILA BORROW PIT - REGIONAL LOCALITY

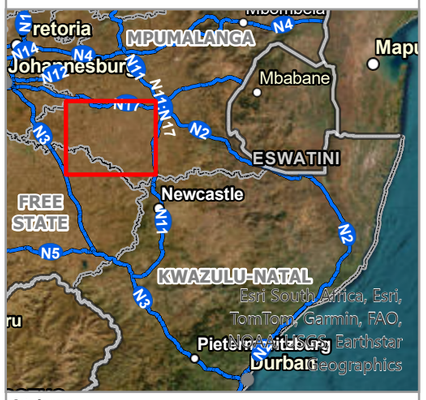


Legend

- Site Location
- Local Municipality
- District Municipality

Road Network

- National Route
- Main Road
- Secondary Road



Data Sources:
Esri World OpenStreetMap

0 7.5 15 Kilometers

SCALE: 1:375 000

DATE:	06 SEPTEMBER 2024	REVISED:	-
DRAWN BY:	N MBOKAZI GIS SPECIALIST	REVIEWED BY:	R SCHRODER PROJECT MANAGER
DATUM: PROJECTION:	WGS84 GEOGRAPHIC	MAP NUMBER:	23-0766-01
PROJECT:	UMMBILA EMOYENI WEF BORROW PIT APPLICATION		
CLIENT:	SERITI GREEN DEVELOPMENTS SOUTH AFRICA (PTY) LTD		

GCS Water & Environmental Consultants

63 Wessel Road Woodmead
PO Box 2597 Rivonia 2128
South Africa

Tel: +27 (0) 11 803 5726
Fax: +27 (0) 11 803 5745
E-mail: jhb@gcs-sa.biz
www.gcs-sa.biz

63 Wessel Road, Rivonia, 2128 PO Box 2597, Rivonia, 2128 South Africa
Tel: +27 (0) 11 803 5726 **Fax:** +27 (0) 11 803 5745 **Web:** www.gcs-sa.biz

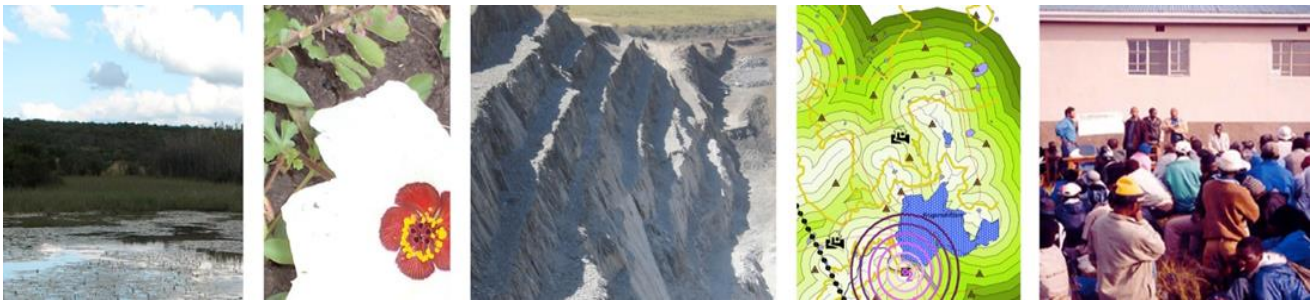
PRELIMINARY SITE SENSITIVITY VERIFICATION FOR THE PROPOSED DEVELOPMENT OF THE BORROW PIT FOR THE CONSTRUCTION OF THE UMMBILA EMOYENI WIND ENERGY FACILITY, IN THE MPUMALANGA PROVINCE

Version – Final

September 2024

GCS Project Number: 23-0766

Client Reference: MP 30/5/1/3/2/14646 MP



GCS (Pty) Ltd. **Reg No:** 2004/000765/07 Est. 1987
Offices: **Johannesburg** (Head Office) | Durban | Gaborone | Lusaka | Maseru | Windhoek | Ostrava
Directors: AC Johnstone (CEO) | W Sherriff

PRELIMINARY SITE SENSITIVITY VERIFICATION FOR THE PROPOSED DEVELOPMENT OF THE BORROW PIT FOR THE CONSTRUCTION OF THE UMMBILA EMOYENI WIND ENERGY FACILITY, IN THE MPUMALANGA PROVINCE

Version – Final

GCS Reference: 23-0766

September 2024

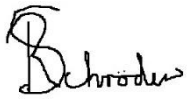
DOCUMENT ISSUE STATUS

Report Issue	Final		
GCS Reference Number	23-0766		
Client Reference	MP 30/5/1/3/2/14646 MP		
Title	**PRELIMINARY SITE SENSITIVITY VERIFICATION FOR THE PROPOSED DEVELOPMENT OF THE BORROW PIT FOR THE CONSTRUCTION OF THE UMMBILA EMOYENI WIND ENERGY FACILITY, IN THE MPUMALANGA PROVINCE**		
	Name	**Signature**	**Date**
Author	Rona Schröder		9 September 2024

Specialist declaration

I, Rona Schröder, in my capacity as a specialist consultant, hereby declare that I:

- Act as an independent consultant;
- Do not have any financial interest in the undertaking of the activity, other than remuneration for the work performed in terms of the National Environmental Management Act (Act No. 107 of 1998);
- Have and will not have vested interest in the proposed activity proceeding;
- Have no, and will not engage in, conflicting interests in the undertaking of the activity;
- Undertake to disclose, to the competent authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the National Environmental Management Act (Act No. 107 of 1998);
- As a registered member of the South African Council for Natural Scientific Professions and the Environmental Assessment Practitioners Association of South Africa (EAPASA), I will undertake my profession in accordance with the Code of Conduct of the Council, as well as any other societies to which I am a member;
- Based on information provided to me by the project proponent and in addition to information obtained during the course of this study, have presented the results and conclusion within the associated document to the best of my professional ability; and
- Reserve the right to modify aspects pertaining to the present investigation should additional information become available through ongoing research and/or further work in this field.



Rona Schröder (Pr.Sci.Nat)(EAPASA) Date: 09 September 2024

SACNASP reg. no. 120605
EAPASA Reg. No. 2020/1149

CONTENTS PAGE

LIST OF FIGURES

LIST OF TABLES

1 INTRODUCTION

GCS Environment South Africa (Pty) Ltd (GCS) has been appointed by Seriti Green Developments South Africa (Pty) Ltd, on behalf of Stefanutti Stocks (Pty) Ltd, to conduct a Site Sensitivity Verification Screening Assessment as part of the application for environmental authorisation for the proposed development of a borrow pit for the construction of the Ummbila Emoyeni Wind Energy Facility.

The assessment will focus on the environmental features associated with the site and how these relate to possible legislated authorisation processes in accordance with the National Environmental related legislation.

2 BACKGROUND

Stefanutti Stocks (Pty) Ltd proposes to establish a borrow pit to be used to abstract construction aggregate for the construction of the Seriti Green Developments South Africa (Pty) Ltd Ummbila Emoyeni Wind Energy Facility, between Bethal and Morgenzon in the Mpumalanga Province.

The site selected would provide the correct quality and quantity of gravel material needed, also the site is located close to the construction site where the material will be used, this reduces the distance that the hauling trucks will need to travel and a reduction in travel time and costs. The site is easily accessible and as such no additional long access roads are required, only a separate entrance from the farmer.

- The site will consist of the following components:
- The borrow pit;
- Topsoil stockpile area;
- Generator and fuel storage area;
- Crushing area;
- Spoils area.

The study site is approximately 4.9ha in size and is located along the R35 between Bethal and Morgenzon on the farm Sukkelaar 421 IS Portion 9. The site is located on an area that is currently being utilised by the farmer for cattle grazing.

The extent of the study site is provided in Figure 2-2 with the corner point coordinates provided in Table 2-1.

Table 2-1: Corner point coordinates of the study site

Label	Latitude	Longitude
1	26°35'41.34"S	29°31'59.69"E
2	26°35'40.95"S	29°32'9.56"E
3	26°35'44.67"S	29°32'10.83"E
4	26°35'47.72"S	29°32'4.50"E
5	26°35'46.03"S	29°31'59.74"E
6	26°35'42.94"S	29°31'59.11"E

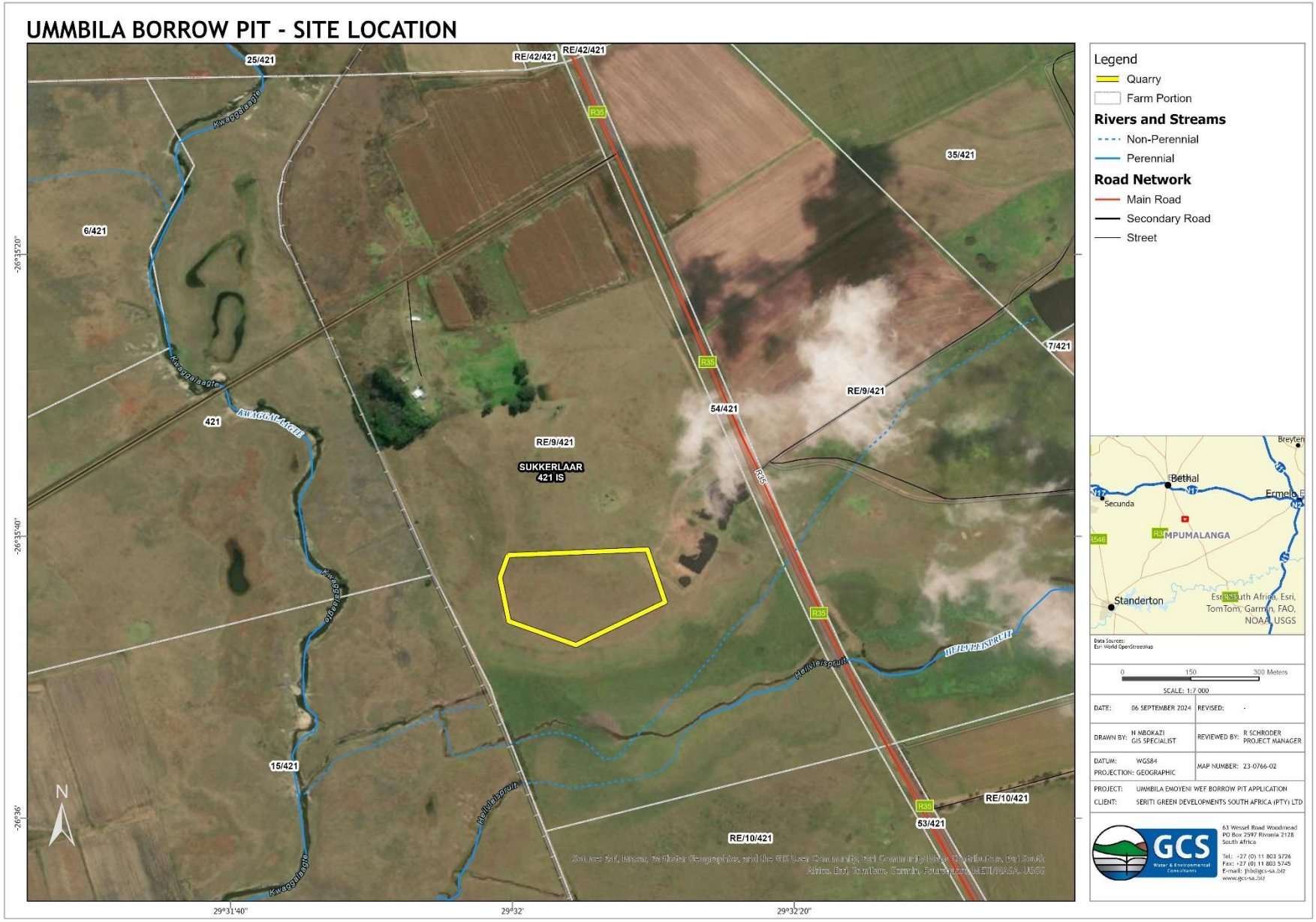


Figure 2-1: Location of the Ummbila Emoyeni Borrow Pit (borrow pit site shown in yellow).

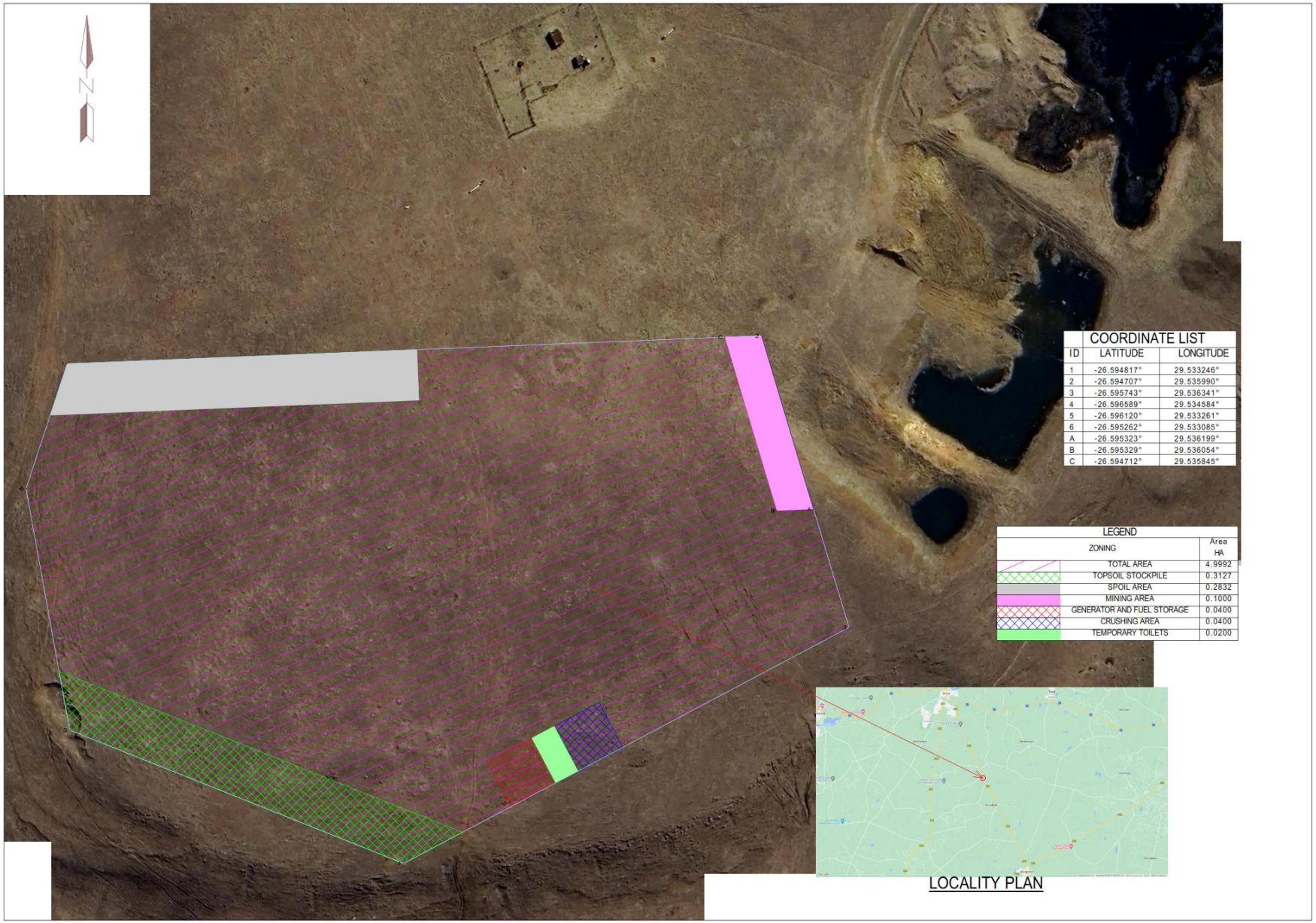


Figure 2-2: Layout Area of the Ummbila Emoyeni Borrow Pit Project.

3 SCOPE OF WORK

The Site Verification Assessment will make provision for the identification of any possible areas of environmental sensitivities within the property boundaries. The Screening Report as generated from the Department of Forestry, Fisheries and the Environment (DFFE) Screening Tool will be used to guide the possible sensitivities in the site area, and a verification of the existing site conditions and sensitivities was investigated.

In addition to the above, the assessment will make provision for an evaluation of the applicable South African environmental legislation and regulations. This will be done to determine the required authorisation(s) that will be required to enable the establishment of a power generation facility on the study site. The Legislation that will be considered in the assessment are as follows:

- National Environmental Management Act (Act No. 107 of 1998): Environmental Impact Assessment Regulations (2014), as amended;
- National Water Act (Act No. 36 of 1998), with a focus on Section 21 of the Act;
- National Environmental Management: Biodiversity Act (Act No. 10 of 2004); and
- National Environmental Management: Protected Areas Act (Act No. 57 of 2003).

The outcome of this legal assessment will provide a clear Permitting and Authorisation Framework for the project as well as an indicative programme and associated cost estimates.

4 METHODOLOGY

The findings of the assessment are based on a Desktop Assessment of available GIS databases to identify any possible environmentally sensitive features within the site or within the immediate vicinity of the site. These features were then used to plan the site visit to verify these areas and to identify any additional features that might require consideration.

The site visit was conducted on 21 August 2024 by Rona Schröder of GCS Environment SA (Pty) Ltd.

5 ASSUMPTIONS AND KNOWLEDGE GAPS

The site is located within an area that is currently used for livestock grazing and is adjacent to a previously excavated borrow pit.

The vegetation has changed due to grazing on the site and previous borrow pit activities.

There is a drainage system, and possible wetlands situated on the property, although not within the boundary of the borrow pit site. The site specifics would be verified by the aquatic specialist.

As the site is located some 250m from the R35 and the area is sparsely populated, as well as the fact that the equipment on site is temporary, the visual impact of the project should not have a major effect on the surrounding receptors.

The site area next to the borrow pit has been excavated before, with success in rehabilitating the area to return to agricultural land use. A positive expectation for the project.

6 DESKTOP FINDINGS

The desktop assessment considered the following databases:

- Information contained in the Department of Forestry, Fisheries and Environment Online Screening Tool Report;
- Biodiversity databases available on the SANBI Website;
- 1 in 50 000 topographical map sheet for the area;
- Recent aerial imagery for the site; and

6.1 Department of Forestry, Fisheries and the Environment (DFFE) Online Screening Tool

The site sensitivities identified in the DFFE Online Screening Tool are provided in Table 6-1.

Table 6-1: Site sensitivities identified in the DFFE Online Screening Tool

Theme	Very high sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Agriculture theme			X	
Animal species theme			X	
Aquatic biodiversity theme				X
Archaeological and cultural heritage theme				X
Civil aviation theme				X
Defence theme				X
Palaeontology theme	X			
Plant species theme			X	
Terrestrial biodiversity theme	X			

6.1.1 Specialist Studies

The findings of the DFFE Online Screening Tool provide an indication of the specialist studies that may need to be completed during an Application for Environmental Authorisation process. The following studies were identified in the DFFE Screening Report.

1. Radioactivity Impact Assessment
2. Traffic Impact Assessment
3. Geotechnical Assessment
4. Socio-Economic Assessment

5. Plant Species Assessment
6. Animal Species Assessment
7. Agricultural Impact Assessment
8. Archaeological and Cultural Heritage Impact Assessment
9. Palaeontology Impact Assessment
10. Terrestrial Biodiversity Impact Assessment
11. Aquatic Biodiversity Impact Assessment
12. Hydrology Assessment
13. Noise Impact Assessment

Table 6-2 below provides a summary of the identified themes and the specialist studies to be completed in support of each theme and Table 6-3 provides a summary of the identified specialist studies and how they will be addressed in the application process.

Table 6-2: Screening Report Themes and Specialist Studies

Themes	Sensitivity	Specialist Study to be undertaken/Motivation for excluding Theme
Agriculture Theme	Medium	The size of the project and duration would not affect the agricultural activities within the area.
Animal Species Theme	Medium	Terrestrial Biodiversity Assessment.
Aquatic Biodiversity Theme	Low	Aquatic and Wetland study.
Archaeological and Cultural Heritage Theme	Low	There are no graves, remnants, infrastructure or any other possible structures of historic value on the site. Mitigation measures will be implemented should any artefacts or relics be uncovered.
Civil Aviation Theme	Low	This project would not affect any aviation activities.
Defence Theme	Low	This project would not affect any defence related activities.
Palaeontology Theme	Very High	The area has been disturbed previously and mitigation measures have been put in place to contact the relevant authority should any paleontological importance.
Plant Species Theme	Medium	Terrestrial Biodiversity Assessment.
Terrestrial Biodiversity Theme	Very High	Terrestrial Biodiversity Assessment.

Table 6-3: Screening Report Specialist Studies and how they will be addressed.

Specialist Studies Identified by DFFE Screening Tool	Way Forward
Radioactivity Impact Assessment	No study is required.
Traffic Impact Assessment	No study is required as the traffic of the borrow pit would not have an additional traffic load that would impact the existing traffic.
Geotechnical Assessment	No study is required.
Socio-Economic Assessment	No study is required.
Plant Species Assessment	Terrestrial Biodiversity Assessment will be completed.
Animal Species Assessment	Terrestrial Biodiversity Assessment will be completed.
Agricultural Impact Assessment	No study is required. The size of the area would not affect the agricultural activities.
Archaeological and Cultural Heritage Impact Assessment	No study is required. There are no historic structured or graves located within the project area.
Palaeontology Impact Assessment	No study is required. Mitigation measures have been put in place to report any uncovered evidence of palaeotropical nature.
Terrestrial Biodiversity Impact Assessment	Terrestrial Biodiversity Assessment will be completed.
Aquatic Biodiversity Impact Assessment	Aquatic and Wetland Assessment will be completed.
Hydrology Assessment	No study is required.

In summary, the following studies will be completed to assess the possible impacts of the project and address the proposed specialist studies as per the screening report recommendations:

- Terrestrial Biodiversity Assessment.
- Wetland and Aquatic Assessment.

6.2 South African National Biodiversity Institute Biodiversity Databases

The following biodiversity related databases applicable to the study site from the South African National Biodiversity Institute (SANBI) BGIS website were interrogated.

6.2.1 National Wetlands Map 5(NFEPA Wetlands Map)

This database provides an indication of possible wetlands on a specific site. There are some wetlands identified near the site with could fall within the regulated 500m. To be further investigated by an appropriate specialist.

6.2.2 National Protected Areas Database

No national protected areas overlap with the study site.

6.2.3 Mpumalanga Biodiversity Conservation Plan (2014)

According to the plan the borrow pit area is situated in a section of an Ecological Support Area (ESA) and Critical Biodiversity Area (CBA). A specialist will confirm the sensitivity of the biodiversity within the area.

6.3 Dated Aerial and Satellite Imagery for the Study Site

The below sequence of dated aerial and satellite imagery was sourced from Google Earth and aerial photographs. The images range from circa 1979 to 2024 and serve to indicate the levels of disturbance to the study site over the past 50 years. The area focused on was the borrow pit footprint site itself as the linear infrastructure (access road) is mostly aligned with existing infrastructure routes.

In Figure 6-3, taken on 10/05/1979 of the area and surrounding landscape it is visible that the site is used for grazing and agricultural use. There is an excavated area already on the site which was likely used previously for the material for road construction and was already by then used for a livestock drinking area.

In Figure 6-3, taken on 06/29/2009 of the area and surrounding landscape it is visible that the site has not changed since the 1970s. The dwellings on site have been constructed. As seen in Figure 6-3 which was taken on 09/06/2011 it is visible that excavation activities have commenced from the previously excavated pit area.

It is visible from the satellite image taken in 2015 in Figure 6-4 that excavations have been undertaken next to the proposed borrow pit site. The previously excavated area was extended and the currently used access road has been constructed. Stockpiles were placed within the proposed borrow pit area.

In Figure 6-5 it is visible that by 2017 the site was rehabilitated, and the dwellings have remained. The dwellings are used by workers on the farm from time to time. Figure 6-6 from 2024, indicates that from 2017 to 2024 there has been no change in land use within the site area. The site is still used for cattle /livestock grazing.

Figure 6-1: Aerial image from 10/05/1979 showing the project area

Figure 6-2: Google Earth image dated 06/29/2009.

Figure 6-3: Google Earth image dated 09/06/2011.

Figure 6-4: Google Earth image dated 11/01/2015.

Figure 6-5: Google Earth image dated 12/18/2017.

Figure 6-6: Google Earth image dated 06/23/2024.

7 ENVIRONMENTAL BASELINE

The section below deals with the baseline conditions on the assessment site and makes provision for a site assessment conducted on the 21st of August 2024. The time of the site assessment is during the end of the part of wintertime. The seasonality of the site visit could compromise the findings of the assessment with regard to aquatic systems. Studies should be done during the wet season. Specialist assessment will confirm the site specifications.

7.1 Topography and Drainage

The topography of the site is flat, with steep ridges towards the south, southwest, and southwest of the borrow pit area, towards the drainage area. Runoff from the site would report to the drainage area and therefore stormwater containment would need to form part of the site management.

7.2 Aquatic features

There are no natural drainage features (watercourses) within the study site. There are watercourses situated outside of the borrow pit area and within 500m of the site. The status of the wetlands will be determined by the Wetland Assessment which will be completed as a specialist study for the Application for Environmental Authorisation as well as an Aquatic Assessment.

7.3 Vegetation

The vegetation on the study site is classified as Soweto Highveld Grassland (Gm8) vegetation type by the National Vegetation Map (2012) managed by the South African National Biodiversity Institute (SANBI).

The vegetation at the project site displays evidence of change, likely due to grazing by livestock and possibly from operations related to the nearby old borrow pit. Figure 7-1 provides a photograph of the current vegetation on the site. Figure 7-2 illustrates the current situation on site and the view towards the R35.

Figure 7-1: Current vegetation on the site area where the proposed borrow pit will be developed.

Figure 7-2: Vegetation of the site area towards the R35.

The area where the borrow pit would be located is considered as somewhat changed due to the grazing and previous excavation activity on the site. Looking at the evidence from the previous excavations, it appears that the disturbed area would revegetate easily once the borrow pit excavations are complete.

Even though the vegetation on the study site is considered to be changed in nature, it still meets the definition of "indigenous vegetation" as per the National Environmental Management Act (Act No. 107 of 1998): Environmental Impact Assessment Regulations (2014), as amended.

7.4 Land use

The site's land use is currently classified as agricultural use. The site has been in the past partially disturbed by mining activities (borrow pit excavations).

8 LEGISLATIVE REVIEW

8.1 National Environmental Management Act (Act No. 107 of 1998): Environmental Impact Assessment Regulations (2014), as amended

The legislative review is based on the consideration of the requirements of the National Environmental Management Act (Act No. 107 of 1998): Environmental Impact Assessment Regulations (2014), as amended.

These regulations make provision for lists of activities that have been identified to potentially result in environmental degradation and as such require assessment and authorisation before they can be undertaken.

The Listed Activities occur in three separate lists, referred to as Listing Notice 1 (Government Notice R327), Listing Notice 2 (Government Notice R325) and Listing Notice 3 (Government Notice R324). Each of these Listed Activities in the individual Listing Notices has a specific Application for Environmental Authorisation procedures.

The following are key definitions contained in the regulations that are pertinent to the project:

- **"development"** means the building, erection, construction or establishment of a facility, structure or infrastructure, including associated earthworks or borrow pits, that is necessary for the undertaking of a listed or specified activity, including any associated post development monitoring, but excludes any modification, alteration or expansion of such a facility structure or infrastructure, including associated earthworks or borrow pits, and excluding the redevelopment of the same facility in the same location, with the same capacity and footprint;
- **"development footprint"** means any evidence of physical alteration as a result of the undertaking of any activity;

- **"indigenous vegetation"** refers to vegetation consisting of indigenous plant species occurring naturally in an area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years;
- **"industrial complex"** means an area used or zoned for industrial purposes, including bulk storage, manufacturing, processing or packaging purposes;
- **"linear activit[ies]y"** means an activity that is arranged in or extending along one or more properties and which affects the environment or any aspect of the environment along the course of the activity, and includes railways, roads, canals, channels, funiculars, pipelines, conveyor belts, cableways, power lines, fences, runways, aircraft landing strips, firebreaks and telecommunication lines;
- **"NEMBA"** means the National Environmental Management: Biodiversity Act (Act No. 10 of 2004);
- **"NEMPAA"** means the National Environmental Management: Protected Areas Act (Act No. 57 of 2003)
- **"urban areas"** means areas situated within the urban edge (as defined or adopted by the competent authority), or in instances where no urban edge or boundary has been defined or adopted, it refers to areas situated within the edge of built-up areas;
- **"watercourse"** means – (a) a river or spring; (b) a natural channel in which water flows regularly or intermittently; (c) a wetland, pan, lake or dam into which, or from which, water flows; and (d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse as defined in the National Water Act (Act No. 28 of 1998); and a reference to a watercourse includes, where relevant, its bed and banks;
- **"wetland"** means land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered in shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.

The tables below provide an assessment of the potential Listed Activities that may be enacted by the construction and operation of the generator complex.

Table 8-1: NEMA: Environmental Impact Assessment Regulations: Listing Notice 2 (GNR R325) (2014 as amended)

ACTIVITY	21
Description	
Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including — (a) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource: or (b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing; but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in Listing Notice 2 applies.	
Discussion	
A mining permit would be required, and therefore this activity would be triggered.	
Outcome	**ENVIRONMENTAL AUTHORISATION REQUIRED**

ACTIVITY	27
Description	
The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for— (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	
Discussion	
More than 1 ha of vegetation would be removed for the development of the borrow pit.	
Outcome	**ENVIRONMENTAL AUTHORISATION REQUIRED**

8.2 National Water Act (Act No. 36 of 1998)

Section 21 of the National Water Act (Act No. 36 of 1998) makes provision for the Water Uses that require a Water Use License or General Authorisation in terms of the Act. The following definitions provided in the Act as well as the associated regulations are applicable to the project.

- **"diverting"** means to, in any manner, cause the instream flow of water to be rerouted temporarily or permanently;
- **"impeding"** means to, in any manner, hinder or obstruct the instream flow of water temporarily or permanently, but excludes the damming of flow so as to cause storage of water;
- **"regulated area of a watercourse"** for Section 21 (c) or (i) of the Act water uses in terms of this Notice means: (a) 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; (b) in the absence of a determined 1 in 100 year flood line or riparian area the area within 100m from the edge of a watercourse where the edge of the watercourse is the first identifiable annual bank fill flood bench; or (c) a 500m radius from the delineated boundary (extent) of any wetland or pan.
- **"riparian habitat"** included the physical structure and associated vegetation of the areas associated with a watercourse which are commonly characterized by alluvial soils, and which are inundated or flooded to an extent and with a frequency sufficient to support vegetation of species with a composition and physical structure distinct from those of adjacent land areas;
- **"watercourse"** means (a) a river or spring; (b) a natural channel in which water flows regularly or intermittently; (c) a wetland, lake or dam into which, or from which, water flows; and (d) 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;
- **"water resource"** includes a watercourse, surface water, estuary, or aquifer;
- **"wetland"** means land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil;

The table below provides the possible Section 21 Water Uses that may require an authorisation.

Table 8-2: Possible Section 21 Water Use Authorisation required

Section 21 Water Use	Description	Applicability	Water Use Authorisation (Y/N)
(a)	Taking water from a water resource	No water would be taken from a water resource.	NO
(b)	Storing water	Water would be brought onto the site and stored in containers on site.	NO
(c)	Impeding or diverting the flow of water in a watercourse	There are water courses and wetland features identified near the borrow pit site. It is therefore assumed that a portion of the borrow pit footprint will be located within the "regulated area of a watercourse". As such there will be a need for a Water Use Authorisation for this water use.	YES
(d)	Engaging in a stream flow reduction activity contemplated in Section 36 of the Act	The proposed activity will not require any stream flow reduction activities to be undertaken as part of its construction or operation. As, there will be no need for a Water Use Authorisation for this water use.	NO
(e)	Engaging in a controlled activity identified as such in Section 37(1) or declared under Section 38(1)	The proposed activity will not require any controlled activities to be undertaken as part of its construction or operation. As, there will be no need for a Water Use Authorisation for this water use.	NO
(f)	Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit	It is understood that no waste or water containing waste will be discharged into any water resource. Based on this assumption, it is understood that there will be no need for a Water Use Authorisation for this water use.	NO
(g)	Disposing of waste in a manner which may detrimentally impact on a water resource	There is no activity planned on the site that would detrimentally impact a water resource.	NO
(h)	Disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process	Neither the construction or the operation of the proposed borrow pit will require the discharge of water containing waste that has been heated in an industrial or power generation process.	**NO**

Section 21 Water Use	Description	Applicability	Water Use Authorisation (Y/N)
(i)	Altering the bed, banks, course or characteristics of a watercourse	There are water courses and wetland features identified near the borrow pit site. It is therefore assumed that a portion of the borrow pit footprint will be located within the "regulated area of a watercourse". As such there will be a need for a Water Use Authorisation for this water use.	YES
(j)	Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people	During the excavation of the proposed borrow pit, dewatering of underground water from the active construction site may be required as a result of the water table in the area. As such there might be a need for a temporary Water Use Authorisation for this water use.	NO
(k)	Using water for recreational purposes	No water associated with the proposed activity will be used for recreational purposes. As there will be no need for a Water Use Authorisation for this water use.	NO

9 CONCLUSION

The purpose of this assessment was to determine the potential legislative authorisations required for the proposed borrow pit project based on the current understanding of the extent and possible design of the facility as well as the site-specific features that are associated with the project as identified on-site and through the DFFE Screening Tool. The findings are as follows:

- The site is located within a Critical Biodiversity Area (CBA) and Ecological Support Areas (ESA) identified area. The site has been changed by previous grazing and excavation works, which does reduce the sensitivity of the site, although it will be determined by the Terrestrial Biodiversity Study.
- Environmental Authorisations will be required for several Listed Activities in accordance with the requirements of the National Environmental Management Act (Act No. 107 of 1998): Environmental Impact Assessment Regulations (2014), as amended.
- A Water Use Authorisation may be required for Section 21 (c) and (i) water uses as the facility is located within the "regulated area of a watercourse" as defined in the National Water Act (Act No. 36 of 1998). As such, it will be necessary to engage an appropriate specialist to conduct the necessary assessment(s) to present to the Department of Water and Sanitation as a motivation for an authorisation.
- Due to the fact that the borrow pit area would be situated within and area previously used for excavation and that the size of the pit area would not affect the agricultural use on site, the impact on the natural vegetation and undisturbed areas is minimal.

APPENDIX A

SPECIALIST CURRICULUM VITAE

Rona Schröder

Senior Environmental Assessment Practitioner

CORE SKILLS

- Project Management
- Environmental Impact Assessment
- Water Use Licencing
- Mining Environmental Compliance
- Environmental Compliance Auditing
- Environmental Strategic Action Plans

DETAILS

Qualifications

- B.Sc. (Hons) Environmental Analysis and Management - University of Pretoria (2011)
- B.Sc. Geology and Management - University of the Free State (2012)
- SHEilds (NEBOSH) International General Certificate in Occupational Health and Safety (2018)
- Certificate in Project Management for Strategic Advantage, University of Stellenbosch Business School (2017)

Professional Registrations

- Environmental Assessment Practitioners Association of South Africa (EAPASA) (2020/1149)
- Pr.Sci.Nat (120605), South African Council for Natural Scientific Professionals)
- International Association for Impact Assessors of South Africa (IAIASA)

Languages

- English
- Afrikaans

Countries Worked In

- South Africa
-

PROFILE

Rona has over 10 years's experience within the environmental management, water and mining field and is aimed at delivering the required environmental services for each client.

Rona has experience in the environmental fields as an Environmental Assessment Practitioner as well as having worked in the mining field on-site ensuring environmental compliance for several mining and processing sites.

She has dealt with projects in the mining, municipal, farming, electricity generation, telecommunications and water industries. She has been involved with environmental projects from site screening and feasibility, environmental application, writing of Environmental Management Programes (EMPr), writing of technical reports all the through to Stakeholder Engagement Processes and completing of projects up to issuing authorization permits and licenses.

- Proposal Writing and project management
- Stakeholder Management and Engagement
- Government institution and authority liaison
- Water Use Licence Applications
- Environmental Impact Assessment / Basic Assessments
- Environmental Compliance Officer
- Public Participation Processes
- Environmental Compliance Auditing
- Mining Environmental Projects and Licensing
- Environmental Screening and Site Evaluations
- Environmental Training

Previous Experience

Period	Employer	Position	Role/ Responsibility
2021 - 2023	Ikwezi Mining & Zinoju Coal & Zarbon Coal	Group Environment Manager	**I started as Group Environment Officer for Ikwezi Mining and Zarbon Coal and was promoted to Group Environment Manager for Ikwezi Mining, Zarbon Coal and Zinoju Coal. Here is a brief description of my responsibilities at Ikwezi Mining and Buffalo Coal.** • **Responsible for obtaining all relevant environmental authorizations and licenses for the current mining and plant operations as well as new projects;** • **Managing environmental compliance for opencast and underground mining operations as well as washing plants;** • **Departmental and community liaising on all environmental aspects;** • **Project planning, project management and process management for applications and specialist studies;** • **Developing and reviewing SOPs and COPs for environmental aspects;** • **Environmental Auditing, compliance tracking and reporting;** • **Environmental awareness program development and implementation;** • **Environmental monitoring and reporting;** • **Action plans development and implementation;** • **Guidance and implementation of Environmental Legislation;**
2019 - 2021	ACE Environmental Solutions	Head of Department: Environmental	• **Project Management; Proposal Writing for new projects; Company Marketing; Document Quality Assurance;** • **Environmental Authorizations, Water Use License Applications and Waste Management License Applications;** • **Client and Government Department Liaisons;** • **Environmental Compliance Auditing;** • **Managing of Environmental Impacts Assessments and developing implementable mitigation measures to reduce possible impacts;** • **Managing Stakeholder Engagement Processes for authorizations and licensing**

			applications; • Development and implementation of Environmental Management Plans (EMP); • Developing Protocols for environmental processes
2013 - 2019	Alta van Dyk Environmental Consultants	Environmental Consultant	• Project Management of multi-disciplinary teams; • Please note that our standard 2023 terms and conditions were sent out in December of 2022. • Environmental Compliance Auditing of Authorizations (ECO), Authorizations and Environmental Management Programmes (EMP); • Project Management for Environmental Processes under the National Environmental Management Act (NEMA), Mineral and Petroleum Resources Development Act (MPRDA) and National Water Act (NWA); • Environmental Authorization, Water Use License and Waste Management License Applications; • Proposal Writing for new projects; • Identification and assessments of Environmental Impacts Assessments and developing implementable mitigation measures to reduce possible impacts; • Report Writing and reviewing; Client and Government Department Liaisons; • Stakeholder Engagement Processes for authorizations and licensing applications; • Development and implementation of Environmental Management Plans (EMP); • Developing License Auditing Protocols for conducting environmental legal compliance audits, • Experience as a Data Controller for a large international company with several operations as part of their due diligence process and management system actions;
2013	**Prime Africa Consultants**	**Risk Assessment Matrix Developer**	• Developing a Multi Criteria Risk Assessment Matrix for site selection during Environmental Impact Assessments.

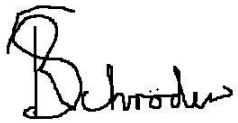
Project Experience

Year	Client	Project Description	Role/Responsibility
2013-2015	Pandora Platinum Mine	Environmental Impact Assessment and Water Use Licence Application	Environmental Practitioner
2014	Lonmin Plc	Baobab, Dwaalkop and Doornvlei External Water Use Licence Audits	Environmental Practitioner
2014-2019	Lonmin Plc	Marikana Operations Water Use Licence Audit	Environmental Practitioner
2015	Lonmin Plc	Precious Metal Refinery Water Use Licence Application	Environmental Practitioner
2015-2016	Lonmin Plc	Marikana Operations Water Use Licence Application	Environmental Practitioner
2016	Keaton Energy	Vanggatfontein Colliery Wash Plant Extension Authorisation	Environmental Practitioner
2016-2018	Keaton Energy	Vanggatfontein Colliery External Water Use Licence Audits	Environmental Practitioner
2016	Nqutu Local Municipality	Rural Electrification Project Ndodekhling-Shayiwe Small Scall Hydropower Plant	Environmental Practitioner
2016	Mhlontlo Local Municipality	Rural Electrification Project Kwa-Madiba Small Scale Hydropower Plant	Environmental Practitioner
2016	Anglo Thermal Coal	Licence and Permitting Database Development – For all Coal Operations	Data Controller
2016	Anglo Platinum	Licence and Permitting Database Development – For all Platinum Operations	Data Controller
2019	Ekurhuleni Metropolitan Municipality	Mooifontein Cemetery Extension Water Use Licence Application	Environmental Practitioner
2019	Blue Valley Golf Estate	Environmental Management Programme	Environmental Practitioner
2017	Nkomati Anthracite	Water Use Licence Audit Report	Environmental Practitioner
2017	Nkomati Anthracite	Basic Assessment Report	Environmental Practitioner
2017-2019	Lonmin Plc	Baobab, Dwaalkop and Doornvlei External Water Use Licence Audits	Environmental Practitioner
2018	Glencore	Chrome Plant Environmental Impact Assessment and Water Use Licence Application	Environmental Practitioner

2018-2019	Lonmin Plc	Precious Metal Refinery Water Use Licence Audit	Environmental Practitioner
2018-2019	Lonmin Plc	Marikana Operations Water Use Licence Application Amendment	Environmental Practitioner
2020-2021	Atlas Towers	Telecommunications Mast Basic Assessments	Project Manager and Environmental Practitioner
2021-2023	Ikwezi Mining	Opencast Mining and Coal Washing Plant Compliance	Group Environmental Manager
2022-2023	Buffalo Coal	Underground Mining and Coal Washing Plant Compliance	Group Environmental Manager

DECLARATION

I, Rona Schröder, hereby declare that the details furnished above are true and correct to the best of my knowledge and belief and I undertake to inform you of any changes therein, immediately. In case any of the above information is found to be false or untrue or misleading or misrepresenting, I am aware that I may be held liable for it.

Signature:  Date: 15/01/2024

Environmental Assessment Practitioners Association of South Africa

Registration No. 2020/1149

Herewith certifies that

Rona Schroder

is registered as an

Environmental Assessment Practitioner

Registered in accordance with the prescribed criteria of Regulation 15. (1) of the Section 24H Registration Authority Regulations (Regulation No. 849, Gazette No. 40154 of 22 July 2016, of the National Environmental Management Act (NEMA), Act No. 107 of 1998, as amended).

Effective: 01 March 2024

Expires: 28 February 2025

Chairperson

Registrar

SAQA
SOUTH AFRICAN QUALIFICATIONS AUTHORITY

SACNASP

South African Council for Natural Scientific Professions

herewith certifies that

Rona Wilma Schroder

Registration Number: 120605

is a registered scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)
in the following field(s) of practice (Schedule 1 of the Act)

Environmental Science (Professional Natural Scientist)

Effective **11 September 2019** Expires **31 March 2025**

Chairperson

Chief Executive Officer

To verify this certificate scan this code

28055749

Universiteit van Pretoria

Die Raad en die Senaat verklaar hiermee dat die graad

Baccalaureus Scientiae Honores

in

Omgewingsanalise en -bestuur

met al die regte en voorregte daaraan verbonde by geleentheid van 'n kongregasie van die Universiteit toegeken is aan

Rona Wilma Schroder

kragtens die Wet op Hoër Onderwys, 1997 en die Statuut van die Universiteit

Namens die Raad en die Senaat

C. de la Rey

Visekanselier en Rektor

Namens die Fakulteit
Natuur- en Landbouwetenskappe

Dekaan

Registrateur

2013-04-17

UNIVERSITY OF THE **FREE STATE**
UNIVERSITEIT VAN DIE **VRYSTAAT**
YUNIVESITHI YA **FREISTATA**

THIS IS TO CERTIFY THAT THE DEGREE HIERMEE WORD VERKLAAR DAT DIE GRAAD

Baccalaureus Scientiae

HAS BEEN CONFERRED UPON
TOEGEKEN IS AAN

SCHRÖDER, Rona Wilma

IN ACCORDANCE WITH THE STATUTES AND REGULATIONS OF THE UNIVERSITY. AS WITNESS OUR RESPECTIVE SIGNATURES AND THE SEAL OF THE UNIVERSITY BELOW.

NADAT AAN DIE STATUTE EN REGULASIES VAN DIE UNIVERSITEIT VOLDOEN IS. AS BEWYS DAARVAN PLAAS ONS ONS ONDERSKEIE HANDTEKENINGE EN DIE SEëL VAN DIE UNIVERSITEIT HIERONDER.

ENDORSEMENT: GEOLOGY AND MANAGEMENT
ENDOSSEMENT: GEOLOGIE EN BESTUUR

VICE- CHANCELLOR / VISEKANSELIER

DEAN / DEKAAN

REGISTRAR / REGISTRATEUR

BLOEMFONTEIN
2012-03-28
2007009976

nebosh

Management of international health and safety

A unit of the:
NEBOSH International General Certificate in Occupational Health and Safety
NEBOSH International Certificate in Construction Health and Safety
NEBOSH International Certificate in Fire Safety and Risk Management

Rona Wilma Schroder

achieved this unit on

12 November 2018

William Nixon
Chair

Ian Taylor
Chief Executive

Master log certificate No: IGC1/00447107/1026644
SQA Ref: UE48 04

The National Examination Board in Occupational Safety and Health
Registered in England & Wales No. 2698100
A Charitable Company
Charity No. 1010444

UNIVERSITEIT·STELLENBOSCH·UNIVERSITY
jou kennisvennoot · your knowledge partner

USB EXECUTIVE DEVELOPMENT LTD
USB BESTUURSONTWIKKELING BPK

Hiermee word gesertifiseer dat
It is hereby certified that

Rona Wilma Schroder

die volgende kursus suksesvol voltooi het
successfully completed the following course

PROJECT MANAGEMENT FOR STRATEGIC ADVANTAGE (ONLINE)

Number of Short Course Credits : 8

Vir die periode
Over the period

24/01/2017 - 10/03/2017

Prof Piet Naude
Director/Direkteur USB

Frik Landman
Chief Executive Officer
Hoof-Uitvoerende Beampte

USB Executive Development
University of Stellenbosch Business School

4497/55470

SCREENING REPORT FOR AN ENVIRONMENTAL AUTHORIZATION AS REQUIRED BY THE 2014 EIA REGULATIONS – PROPOSED SITE ENVIRONMENTAL SENSITIVITY

EIA Reference number: NA

Project name: uMmbila Emoyeni WEF Borrow Pit Application

Project title: uMmbila Emoyeni WEF Borrow Pit Application

Date screening report generated: 08/11/2023 10:56:24

Applicant: Stefanutti Stocks (Pty) Ltd

Compiler: Magnus van Rooyen

Compiler signature:

.....

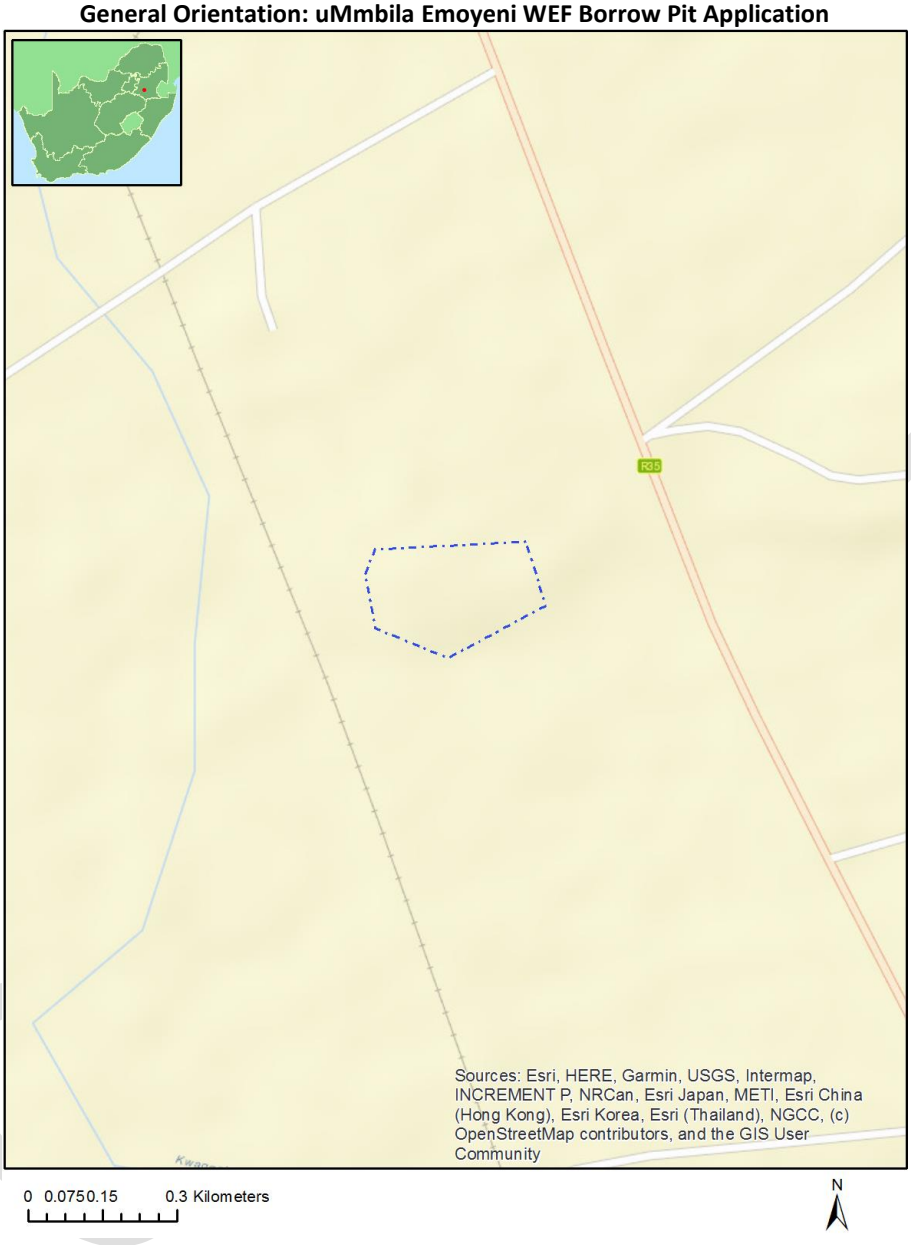
Application Category: Mining|Mining Permit

Table of Contents

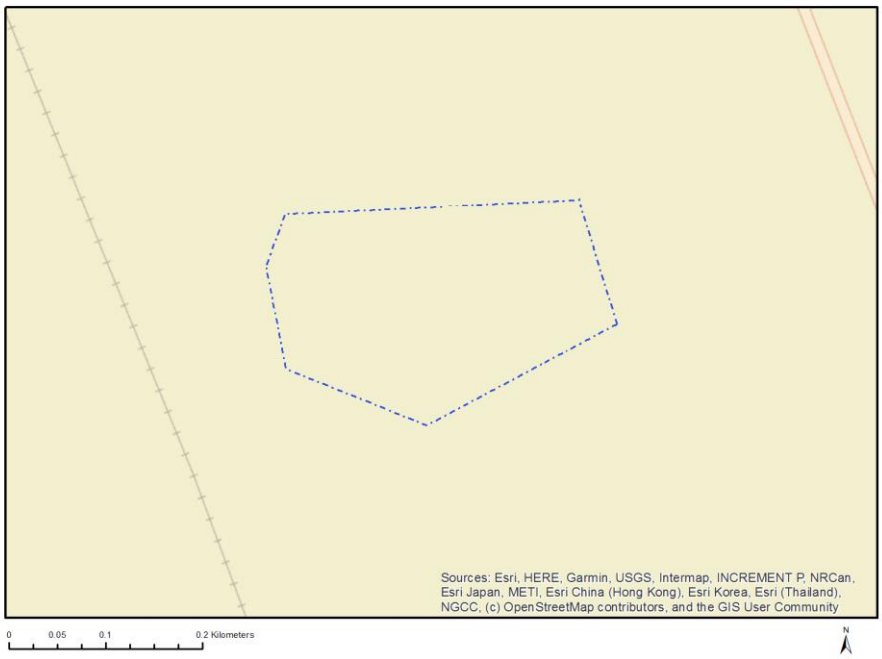
Proposed Project Location

Orientation map 1: General location

General Orientation: uMmbila Emoyeni WEF Borrow Pit Application



Map of proposed site and relevant area(s)



Cadastral details of the proposed site

Property details:

No	Farm Name	Farm/ Erf No	Portion	Latitude	Longitude	Property Type
1	SUKKELAAR	421	0	26°34'47.76S	29°31'25.64E	Farm
2	SUKKELAAR	421	9	26°35'34.9S	29°32'1.45E	Farm Portion

Development footprint[1] vertices:
No development footprint(s) specified.

Wind and Solar developments with an approved Environmental Authorisation or applications under consideration within 30 km of the proposed area

No	EIA Reference No	Classification	Status of application	Distance from proposed area (km)
1	14/12/16/3/3/2/754	Solar PV	Approved	28.3

[1] "development footprint", means the area within the site on which the development will take place and incudes all ancillary developments for example roads, power lines, boundary walls, paving etc. which require vegetation clearance or which will be disturbed and for which the application has been submitted.

Environmental Management Frameworks relevant to the application

No intersections with EMF areas found.

Environmental screening results and assessment outcomes

The following sections contain a summary of any development incentives, restrictions, exclusions or prohibitions that apply to the proposed development site as well as the most environmental sensitive features on the site based on the site sensitivity screening results for the application classification that was selected. The application classification selected for this report is: **Mining|Mining Permit**.

Relevant development incentives, restrictions, exclusions or prohibitions

The following development incentives, restrictions, exclusions or prohibitions and their implications that apply to this site are indicated below.

Incentive, restriction or prohibition	Implication
Air Quality-Highveld Priority Area	https://screening.environment.gov.za/ScreeningDownloads/DevelopmentZones/HIGHVELD_PRIORITY_AREA_AQMP.pdf
Strategic Gas Pipeline Corridors-Phase 8: Rompco Pipeline Corridor	https://screening.environment.gov.za/ScreeningDownloads/DevelopmentZones/Combined_GAS.pdf

Proposed Development Area Environmental Sensitivity

The following summary of the development site environmental sensitivities is identified. Only the highest environmental sensitivity is indicated. The footprint environmental sensitivities for the proposed development footprint as identified, are indicative only and must be verified on site by a suitably qualified person before the specialist assessments identified below can be confirmed.

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Agriculture Theme			X	
Animal Species Theme			X	
Aquatic Biodiversity Theme				X
Archaeological and Cultural Heritage Theme				X
Civil Aviation Theme				X
Defence Theme				X
Paleontology Theme	X			
Plant Species Theme			X	
Terrestrial Biodiversity Theme	X			

Specialist assessments identified

Based on the selected classification, and the known impacts associated with the proposed development, the following list of specialist assessments have been identified for inclusion in the assessment report. It is the responsibility of the EAP to confirm this list and to motivate in the

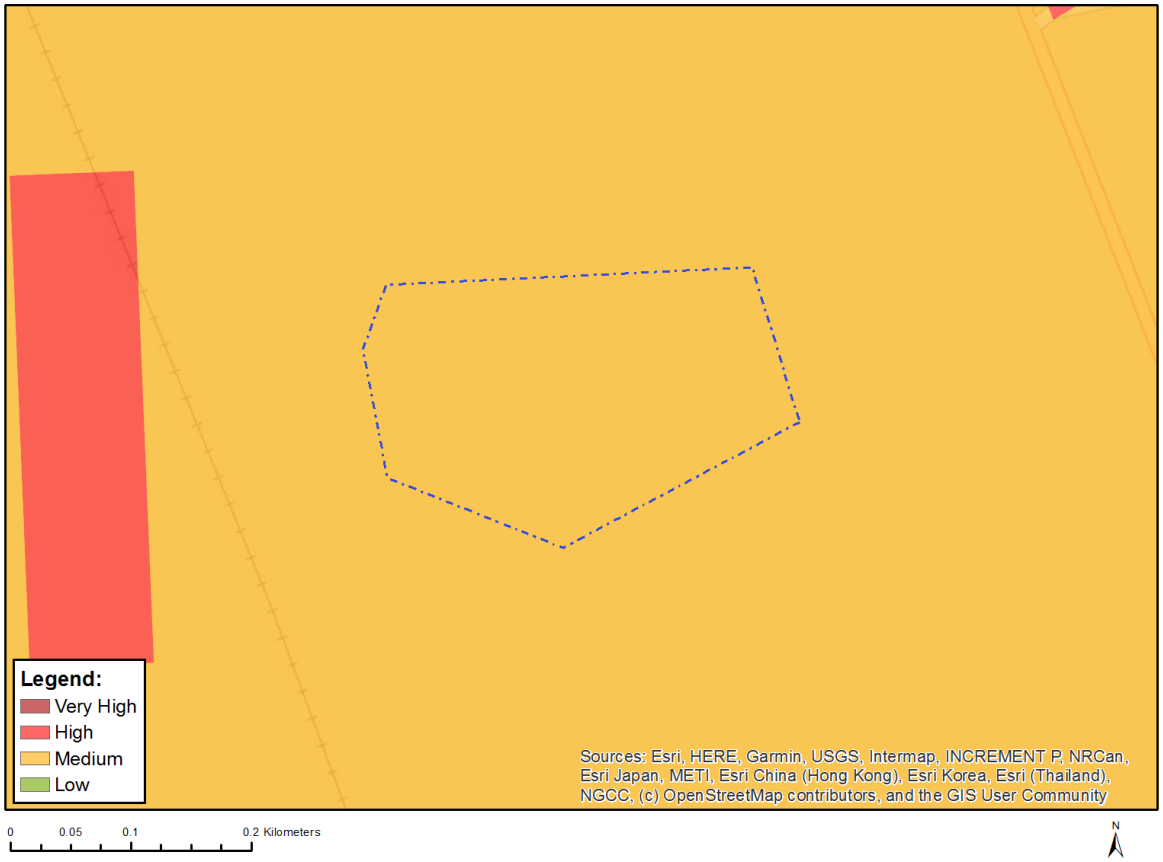
assessment report, the reason for not including any of the identified specialist study including the provision of photographic evidence of the site situation.

No	Specialist assessment	Assessment Protocol
1	Radioactivity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf
2	Traffic Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf
3	Geotechnical Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf
4	Socio-Economic Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf
5	Plant Species Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Plant_Species_Assessment_Protocols.pdf
6	Animal Species Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Animal_Species_Assessment_Protocols.pdf
7	Agricultural Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Agriculture_Assessment_Protocols.pdf
8	Archaeological and Cultural Heritage Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf
9	Palaeontology Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf
10	Terrestrial Biodiversity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Terrestrial_Biodiversity_Assessment_Protocols.pdf
11	Aquatic Biodiversity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Aquatic_Biodiversity_Assessment_Protocols.pdf
12	Hydrology Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf
13	Noise Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Noise_Impacts_Assessment_Protocol.pdf

Results of the environmental sensitivity of the proposed area.

The following section represents the results of the screening for environmental sensitivity of the proposed site for relevant environmental themes associated with the project classification. It is the duty of the EAP to ensure that the environmental themes provided by the screening tool are comprehensive and complete for the project. Refer to the disclaimer.

MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY

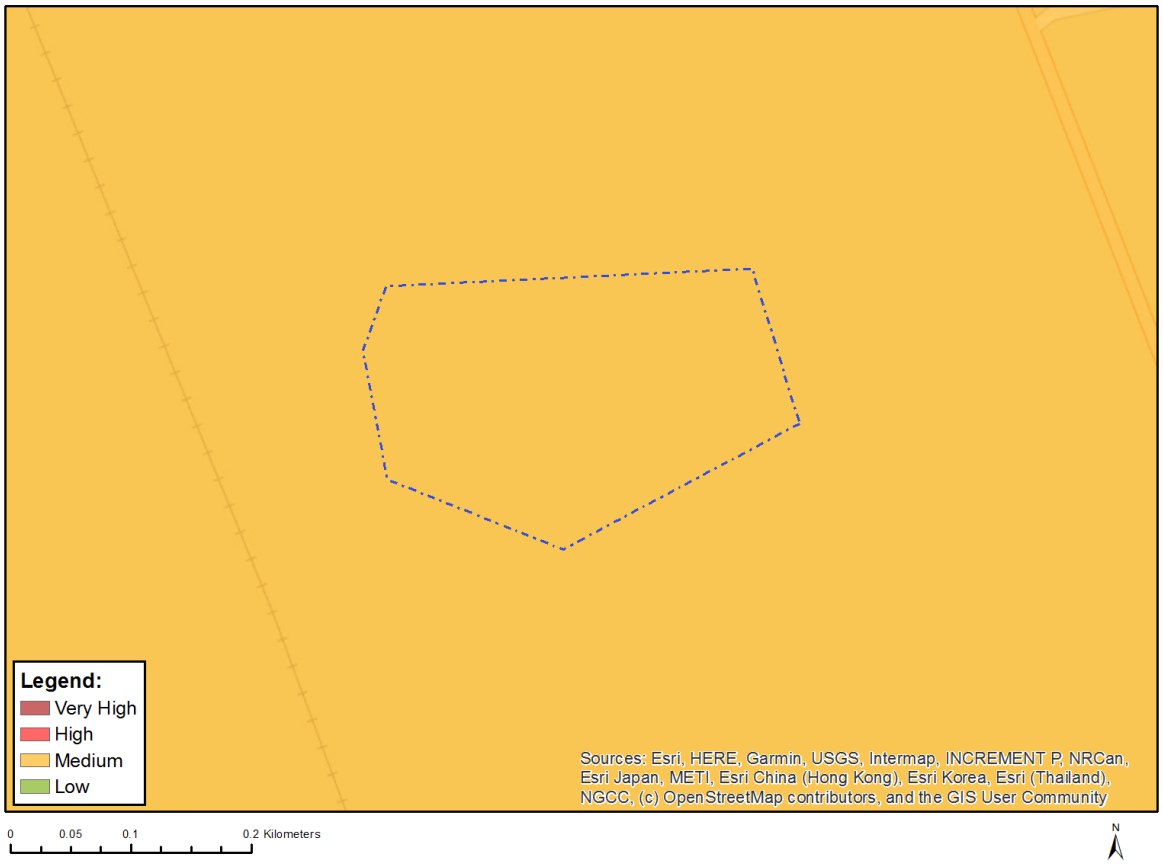


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Medium	Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate

MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



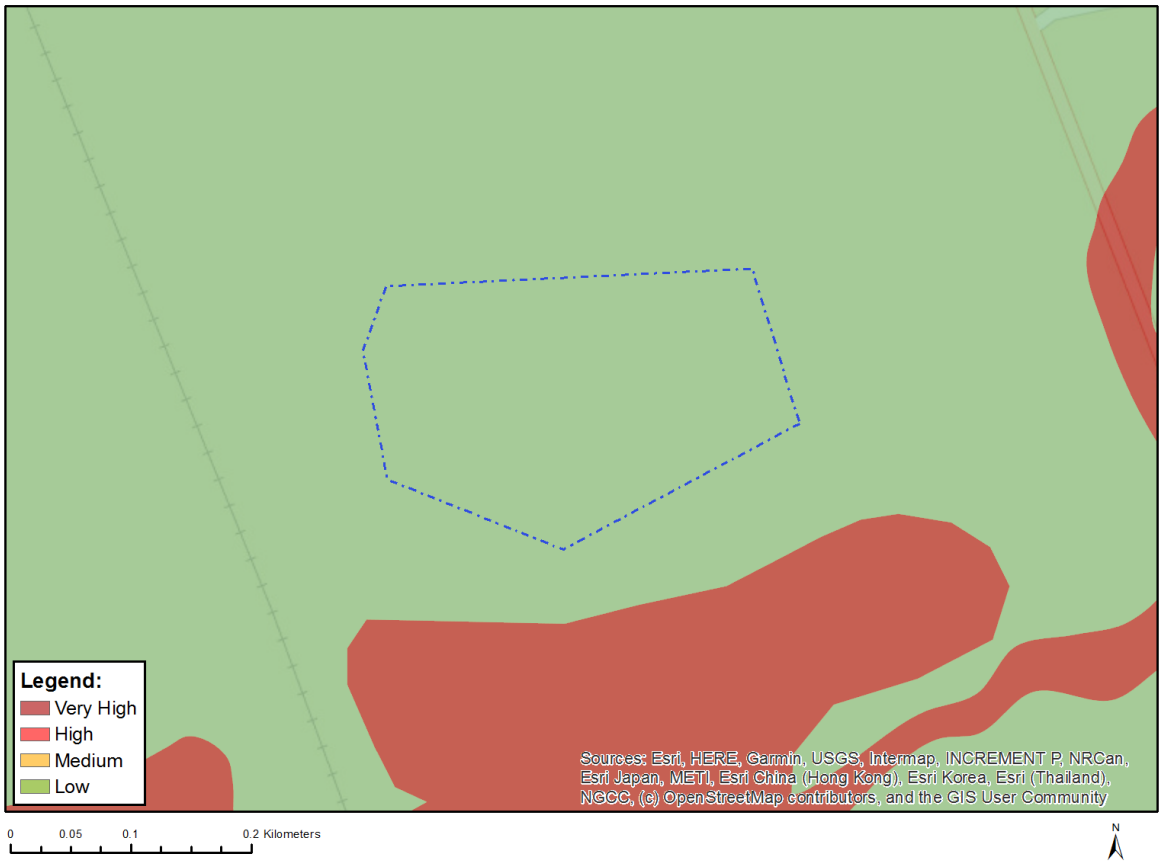
Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Medium	Aves-Tyto capensis
Medium	Aves-Circus ranivorus
Medium	Aves-Eupodotis senegalensis
Medium	Insecta-Lepidochrysops procera
Medium	Mammalia-Crocidura maquassiensis
Medium	Mammalia-Ourebia ourebi ourebi

MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY

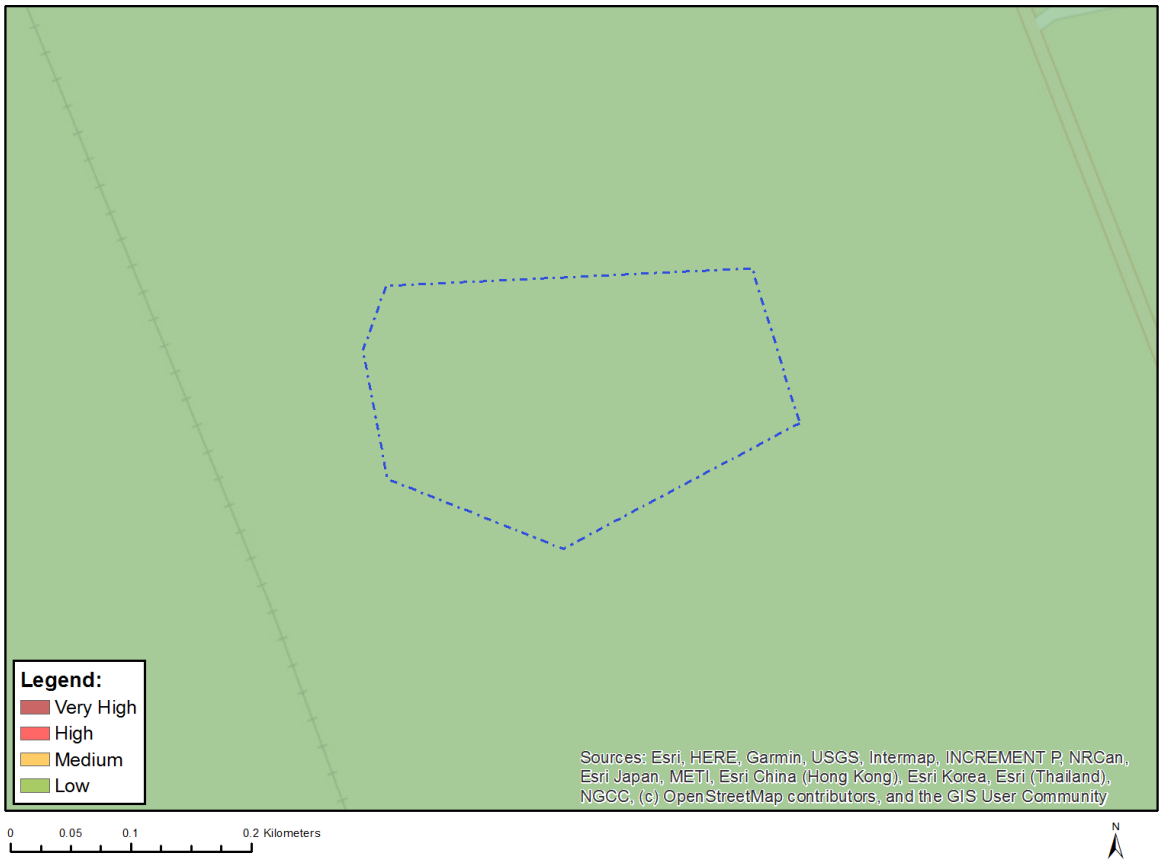


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity

MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY

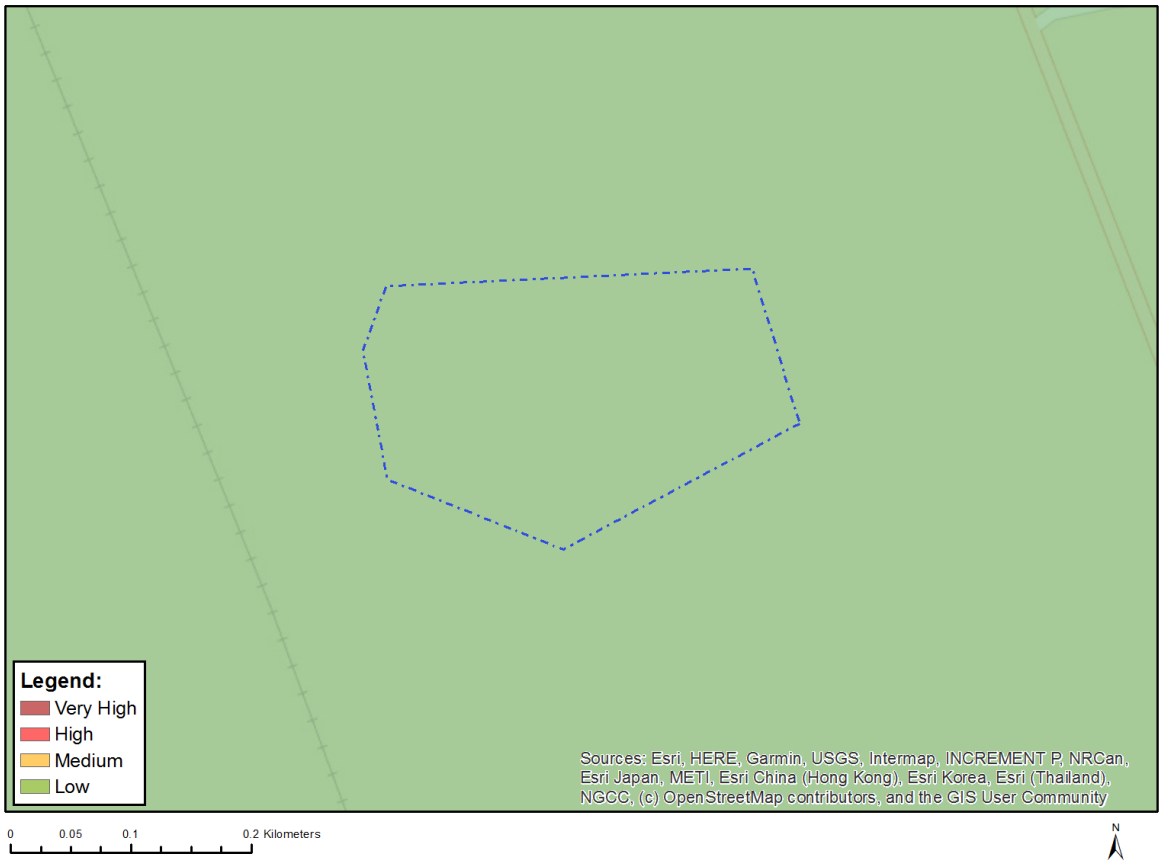


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity

MAP OF RELATIVE CIVIL AVIATION THEME SENSITIVITY

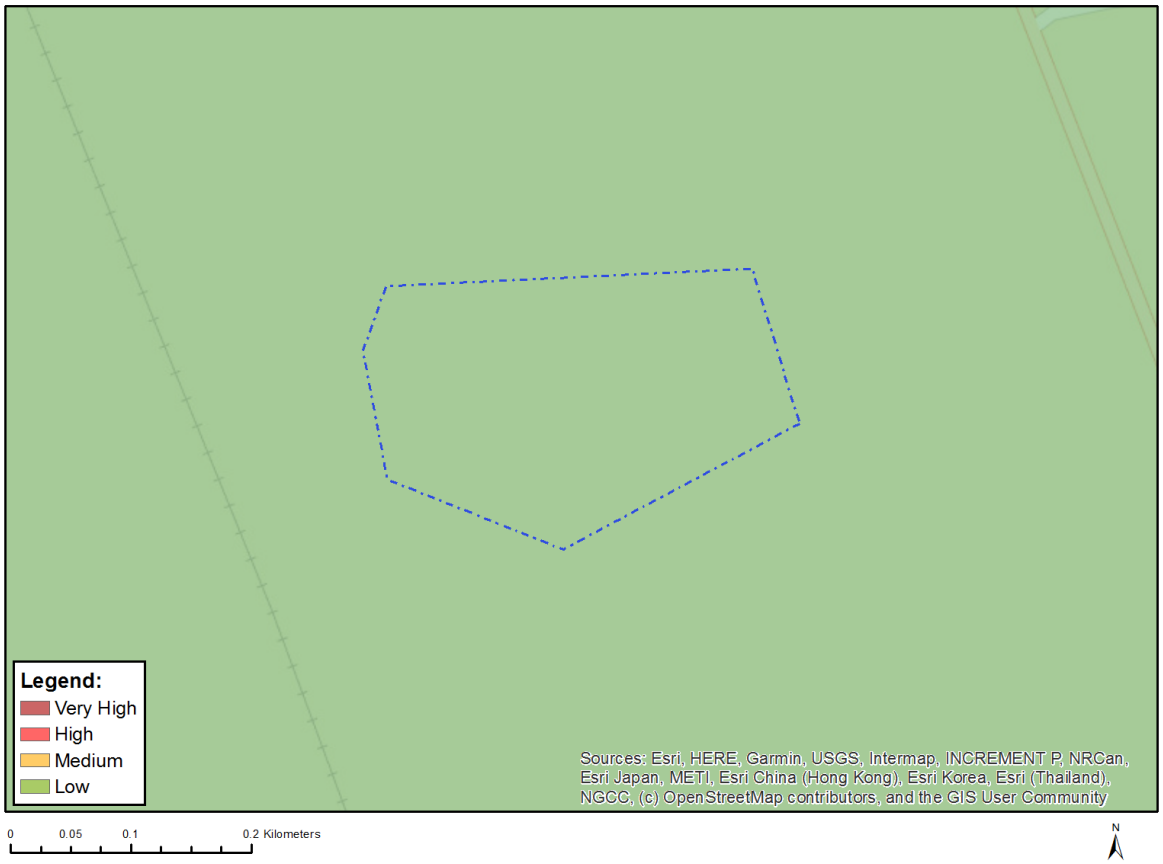


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity

MAP OF RELATIVE DEFENCE THEME SENSITIVITY

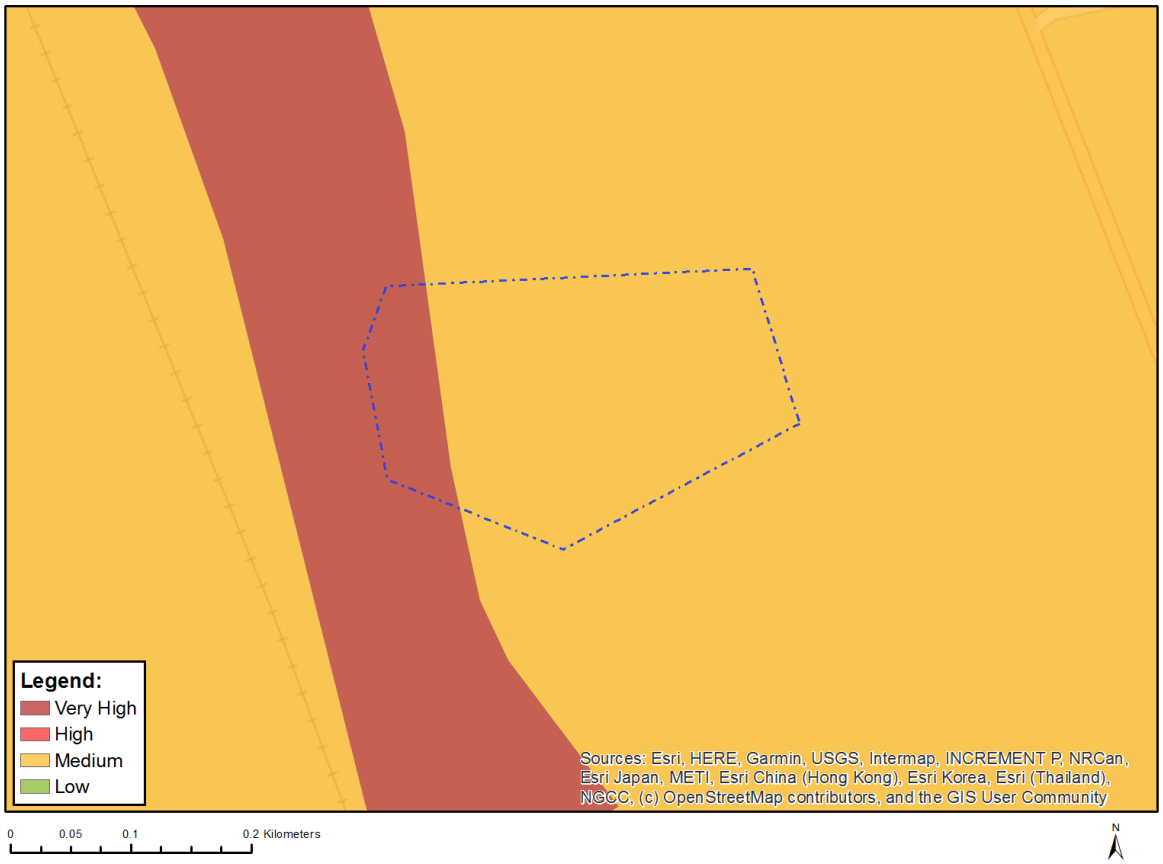


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity

MAP OF RELATIVE PALEONTOLOGY THEME SENSITIVITY

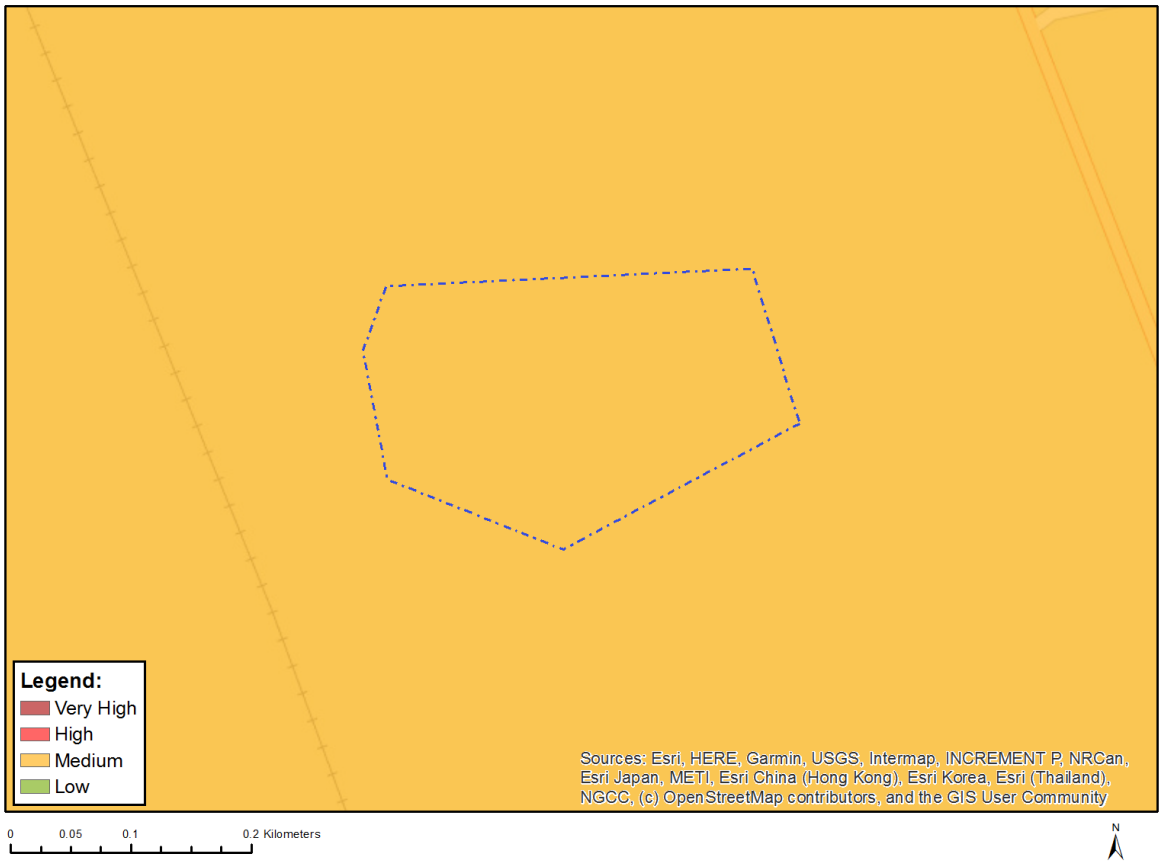


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Medium	Features with a Medium paleontological sensitivity
Very High	Features with a Very High paleontological sensitivity

MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY



Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Medium	Sensitive species 1252
Medium	Miraglossum davyi
Medium	Sensitive species 691
Medium	Pachycarpus suaveolens

MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

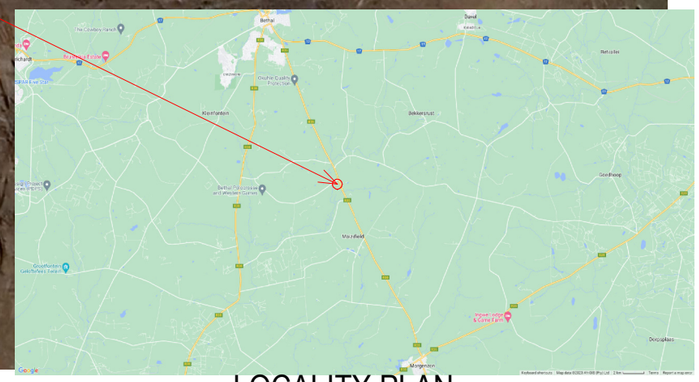
Sensitivity Features:

Sensitivity	Feature(s)
Very High	CBA 2
Very High	ESA: Landscape corridor
Very High	National Protected Area Expansion Strategy (NPAES)
Very High	VU_Soweto Highveld Grassland

N

COORDINATE LIST		
ID	LATITUDE	LONGITUDE
1	-26.594817°	29.533246°
2	-26.594707°	29.535990°
3	-26.595743°	29.536341°
4	-26.596589°	29.534584°
5	-26.596120°	29.533261°
6	-26.595262°	29.533085°
A	-26.595323°	29.536199°
B	-26.595329°	29.536054°
C	-26.594712°	29.535845°

LEGEND		
ZONING		Area HA
	TOTAL AREA	4.9992
	TOPSOIL STOCKPILE	0.3127
	SPOIL AREA	0.2832
	MINING AREA	0.1000
	GENERATOR AND FUEL STORAGE	0.0400
	CRUSHING AREA	0.0400
	TEMPORARY TOILETS	0.0200



LOCALITY PLAN

Application for an Environmental Authorisation, General Authorisation and Mining Permit Application for the Borrow Pit for the Ummbila Emoyeni Wind Energy Facility near Bethal, Mpumalanga

GCS Ref No: 23-0766

Seriti Green Developments South Africa (Pty) Ltd, on behalf of Stefanutti Stocks (Pty) Ltd, has appointed GCS Water and Environmental Consultants (Pty) Ltd (GCS) to assist with the applications for an Environmental Authorisation (EA), General Authorisation (GA) and Mining Permit (MP) for the proposed Borrow Pit for the construction of the Ummbila Emoyeni Wind Energy Facility. The Borrow Pit is situated within the Jurisdiction of Lekwa Local Municipality of the Gert Sibande District Municipality, Mpumalanga.

The project is located on Portion 9 of the Farm Sukkelaar 421 IS, and will entail a 4.9Ha footprint area for a borrow pit, site office and ablution facilities, stockpiles, generator and fuel storage area and a crushing area.

This notification forms part of the public consultation process for the Basic Assessment process as required by the National Environmental Management Act,1998 (Act 107 of 1998) (NEMA) EIA Regulations (2014, as amended), Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) (MPRDA) and the National Water Act, 1998 (Act 36 of 1998) (NWA).

The following potential Listed Activities in terms of the NEMA EIA Regulations (2014, as amended) will be applied for from the Department of Mineral Resources and Energy (DMRE):

- GN R327, 07 April 2017 (as amended), Listing Notice 1 – Activities 21 and 27

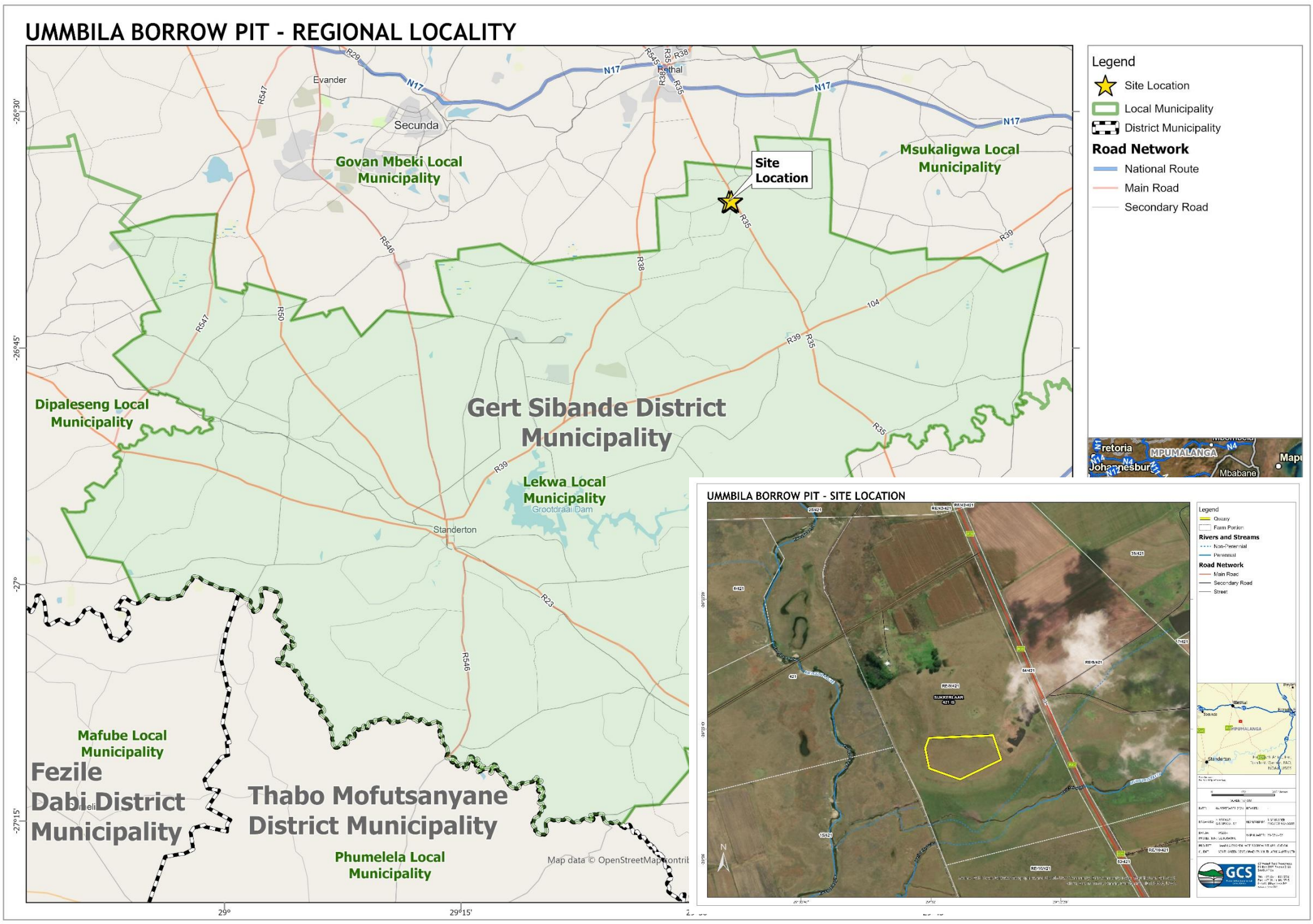
A WUL application, to be administered by the Department of Water and Sanitation (DWS) will be lodged for the following water uses:

- Section 21 (c); (i) and (j) of the NWA.

Opportunity to Participate

Interested and Affected Parties (I&APs) are invited to register as stakeholders for this project and to obtain more information. The Draft Basic Assessment Report (DBAR) is available for review and comment from **13 September to 14 October 2024** as follows:

- Electronic copy at: https://www.gcs-sa.biz/public-documents/
- Bethal Public Library (Danie Nortje Street, Bethal – Tel: 017 624 3029)



To register and to obtain more information contact GCS (Pty) Ltd: Rona Schröder / Gerda Bothma, Tel: 011 803 5726, Fax: 011 803 5745, E-mail: ronas@gcs-sa.biz / gerdab@gcs-sa.biz or Mail: P O Box 2597, Rivonia, 2128.

I&AP's are invited to participate by providing written comments and raising issues of concern.

OUR SCHOOLS

Rita goes to SACSSA nationals

BETHAL - Rita Sology from the Young Harvest Christian School participated in the South African Christian Schools Sports Association's (SACSSA) regional athletics meeting held in Ermelo recently and qualified to participate in the National SACSSA Athletics Championship in Sasolburg at the end of September. She will compete in the 100m at the nationals for the third time and has so far earned two silver medals for the season.

Highveld Christian College athletes Amila Sosibo, Okuhle Mahlangu, Terrence Bungu, Tshiliso Motsoeneng, Nompendulo Mathebula, Melizwi Biyela, Phenyo Molaotsi, Xander Coles, Aline Kalonji and Mireya Fredrick competed in the regional athletics in Ermelo on August 24.

HCC's athletes bring home medals

SECUNDA - Highveld Christian College athletes excelled at the regional athletics held in Ermelo on August 24.

Athletes brought home medals and have qualified for the national athletics event of September 20 to 21.

Winning medals at the regionals were Amila Sosibo (12) bronze, Okuhle Mahlangu (12) bronze and silver, Terrence Bungu (11) silver, Tshiliso Motsoeneng (11) two gold and two silver, Nompendulo Mathebula (11) two bronze, Phenyo Molaotsi (9) gold, Xander Coles (7) gold, Aline Kalonji (7) three gold, Mireya Fredrick (7) bronze and Yethaba Shandu (7) silver.

Melizwi Biyela (8) qualified for the national athletics.

Leerders dring deur na Mpumalanga proewe

SECUNDA - Dié leerders van Laerskool Goedehoop is vir die Gert Sibande krieketspan gekies wat gedurende die skoolvakansie aan die Mpumalanga proewe gaan deelneem.

Laerskool Trichardt boys selected for Gert Sibande teams

Laerskool Trichardt's cricket boys Ruben Viljoen, Dirk van Deventer, Syabonga Ndlovu, Pierre van Renssburg and Xander Muller have been selected to play for the U13 Gert Sibande team. They will participate in the Mpumalanga trials from September 20 to 22 in Middelburg. With the U13s are school cricket coach Johan Prinsloo.

Hokkiespan oorgehaal vir Mpumalanga-uitspele

SECUNDA - Laerskool Goedehoop se o13-seunshokkiespan is die naaswenners in die Gert Sibanda Liga en het deurgedring om aan die Mpumalanga-uitspele wat op 7 September op Middelburg plaasgevind het, deel te neem. Hiér is die span saam met hul afrigters, Kristelle Hattingh en Lunette Potgieter.

2 Impunzi Place
Kloof
KwaZulu-Natal
3640

Tel: +27 83 556 4087
Email: info@ecolinksa.co.za

WETLAND AND AQUATIC ASSESSMENT ASSOCIATED PROPOSED BORROW PIT NEAR THE TOWN OF BETHAL, MPUMALANGA PROVINCE

Version – Final

August 2024

Project Number: 24-0016

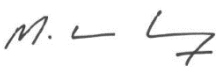
Client Reference:

WETLAND AND AQUATIC ASSESSMENT ASSOCIATED PROPOSED BORROW PIT NEAR THE TOWN OF BETHAL, MPUMALANGA PROVINCE

Version – Final

August 2024

DOCUMENT ISSUE STATUS

Report Issue	Final		
Ecolink Reference Number	24-0016		
Client Reference	23-0766		
Title	**WETLAND AND AQUATIC ASSESSMENT ASSOCIATED PROPOSED BORROW PIT NEAR THE TOWN OF BETHAL, MPUMALANGA PROVINCE**		
	Name	**Signature**	**Date**
Author	Magnus van Rooyen		August 2024
Director	Magnus van Rooyen		August 2024

CONTENTS PAGE

LIST OF FIGURES

LIST OF TABLES

LIST OF PLATES

Declaration

I, Magnus van Rooyen, in my capacity as a specialist consultant, hereby declare that I:

- Act as an independent consultant;
- Do not have any financial interest in the undertaking of the activity, other than remuneration for the work performed in terms of the National Environmental Management Act (Act No. 107 of 1998);
- Have and will not have vested interest in the proposed activity proceeding;
- Have no, and will not engage in, conflicting interests in the undertaking of the activity;
- Undertake to disclose, to the competent authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the National Environmental Management Act (Act No. 107 of 1998);
- As a registered member of the South African Council for Natural Scientific Professions, will undertake my profession in accordance with the Code of Conduct of the Council, as well as any other societies to which I am a member;
- Based on information provided to me by the project proponent and in addition to information obtained during the course of this study, have presented the results and conclusion within the associated document to the best of my professional ability; and
- Reserve the right to modify aspects pertaining to the present investigation should additional information become available through ongoing research and/or further work in this field.

Magnus van Rooyen (Pr.Sci.Nat) August 2024

SACNASP reg. no. 400335/11 Date

WETLAND AND AQUATIC ASSESSMENT ASSOCIATED PROPOSED BORROW PIT NEAR THE TOWN OF BETHAL, MPUMALANGA PROVINCE

1 INTRODUCTION

Ecolink Consulting has been appointed by GCS (Pty) Ltd to conduct a Wetland and Aquatic Assessment associated with the proposed operation of a borrow pit near the town of Bethal in the Mpumalanga Province. The material sourced from the borrow pit will be used in the construction of the Ummbila Emoyeni Wind Energy Facility (WEF) that is being developed in the surrounding area.

The assessment will be submitted in support of the Application for Environmental Authorisation in accordance with the National Environmental Management Act (Act No. 107 of 1998): Environmental Impact Assessment Regulations (2014), as amended and the Water Use Licence Application in accordance with the National Water Act (Act No. 36 of 1998).

2 PROJECT BACKGROUND

2.1 Project location and extent

The proposed borrow pit is located approximately 16km to the southeast of the town of Bethal along the R35 road between Bethal and Morgenzon (see Figure 2-1). To meet the requirements for a Mining Permit Application in accordance with the Mineral and Petroleum Resources Development Act (Act No. 28 of 2002), the extent of the borrow pit is limited to maximum area of 5ha. The corner point coordinates of the borrow pit is provided in Table 2-1 with the extent shown in Figure 2-2.

Table 2-1: Borrow pit corner point coordinates

Coordinate	Latitude	Longitude
A	26° 35' 40.97" S	29° 32' 09.55" E
B	26° 35' 44.70" S	29° 32' 10.83" E
C	26° 35' 47.72" S	29° 32' 04.48" E
D	26° 35' 46.04" S	29° 31' 59.73" E
E	26° 35' 42.99" S	29° 31' 59.09" E
F	26° 35' 41.38" S	29° 31' 59.73" E

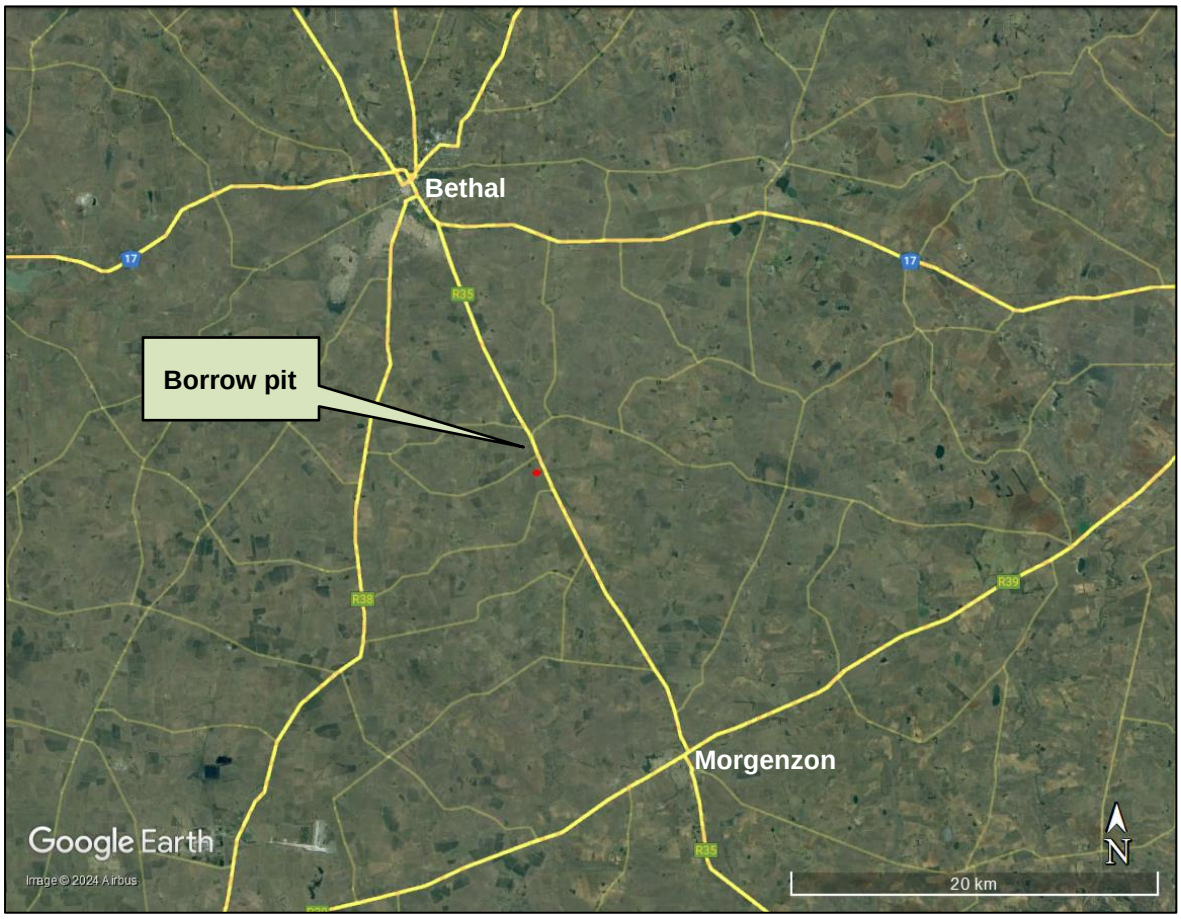


Figure 2-1: Location of the proposed borrow pit between the towns of Bethal and Morgenzon

Figure 2-2: Extent of the borrow pit

2.2 Project description

The proposed borrow pit is located on a ridge line on portion 9 of the Farm Sukkelaar No. 421 IS above and to the north of the Heilvleispruit that is a tributary of the Kwaggalaagtespruit. The borrow pit is located in an area that is typically used for agricultural purposes which include the growing of grains and the farming of livestock.

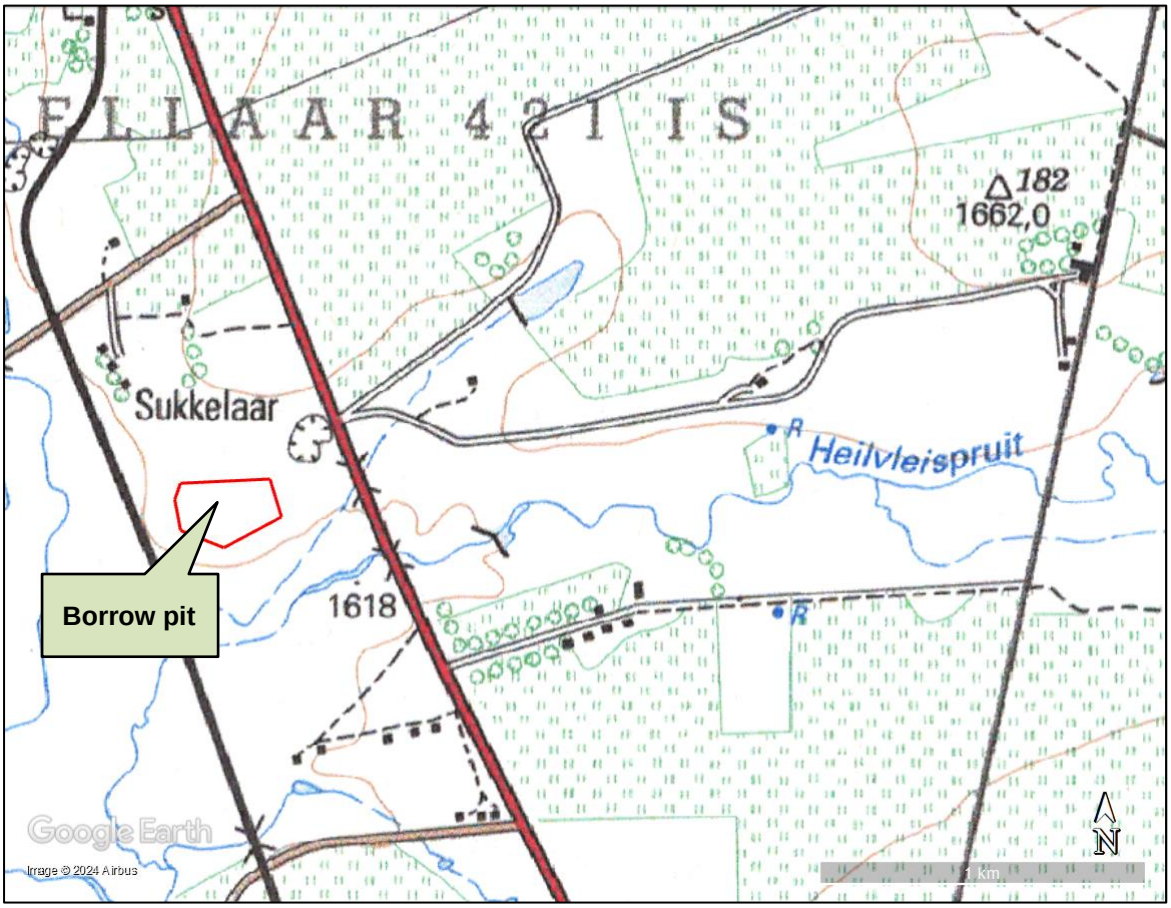


Figure 2-3: Location of the borrow pit area on the ridge line above the Heilvleispruit (extract from the 1 in 50 000 map sheet 2629DA)

The proposed borrow pit is located immediately to the west of an old borrow pit area that was opened *circa* 1968 (see Figure 2-4) and showing signs of use as recent as 2017 (see Figure 2-5). The material sourced from the borrow pit area was likely used for the upgrading of the provincial district roads in the area by the provincial roads' authority.

The material that will be sourced from the borrow pit consists of weathered dolerite and will be used solely for the construction of the roads associated with the Ummbila Emoyeni WEF that is located in the areas surrounding the borrow pit.

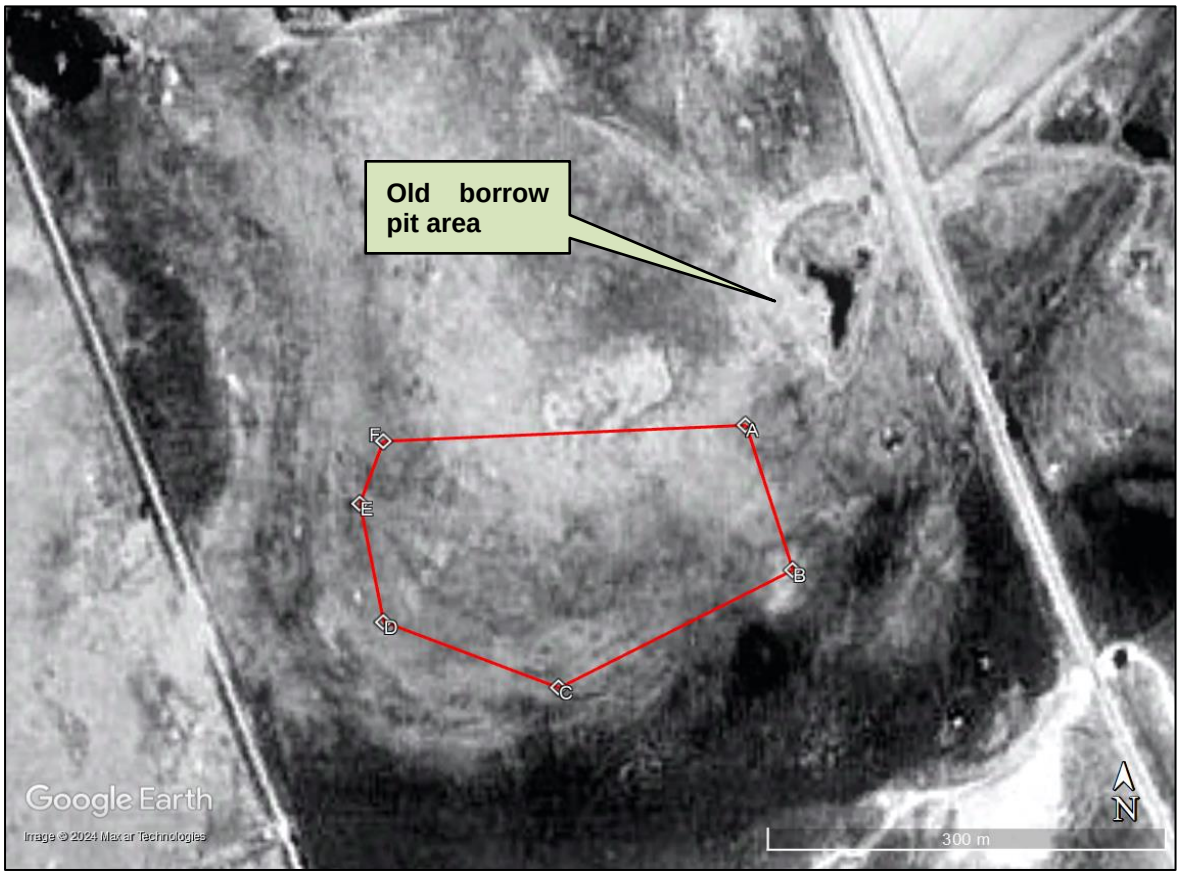


Figure 2-4: Dated aerial image (1968) of the existing borrow pit (supplied by the Surveyor General)

Figure 2-5: Aerial image (2017) in which the old borrow pit area shows signs of use

Plate 2-1: View of the existing old borrow pit area, looking in a southerly direction

3 APPLICABLE SOUTH AFRICAN LEGISLATION

The national and provincial legislation briefly described in this section relates directly with the legal aspects associated with the biodiversity associated with the project.

3.1 Applicable National Legislation

The project applicable environmental related National Legislation is provided in Table 3-1.

Table 3-1: Applicable National Legislation

Legislation	Description
Constitution of the Republic of South Africa (Act No. 108 of 1996)	According to the South African Constitution, South African citizens have the right to have the environment protected for the benefit of the present and future generations.
Conservation of Agricultural Resources Act (Act No. 43 of 1983)	This Act includes the use and protection of land, soil, wetlands and vegetation and the control of weeds and invader plants. In the regulations published in 1984 under the Act, which declared approximately 50 plant species as "weeds" or "invader plants". This list was further expanded on 30 March 2001 to now contain a comprehensive list of declared weed and invader plant species.
White Paper on Environmental Management Policy for South Africa (1998)	Through this Policy, the government of South Africa commits to give effect to the many rights in the Constitution that relate to the environment.
National Veld and Forest Fire Act (Act No. 101 of 1998)	The purpose of the Act is to prevent and combat veld fires in the country. The Act was amended by the National Forest and Fire Laws Amendment Act (Act No. 12 of 2001).
National Water Act (Act No. 36 of 1998)	This Act recognises that water is a scarce and unevenly distributed natural resource that should be equitably utilised in a sustainable manner. The Act ensures that water resources are protected, used, developed, conserved and controlled in ways that take into account a range of needs and obligations, including the need to "protect aquatic and associated ecosystems and their biological diversity". The Act further specifies the water uses that must be authorised and it details the authorisation procedures as well as the minimum requirements for evaluation and decision-making by the relevant authority.
National Forests Act (Act No. 84 of 1998)	An objective of the Act is to provide special measures for the protection of certain forest and tree species, and to promote the sustainable use of forests for environmental, economic, educational, recreational, cultural, health and spiritual purposes. In terms of Section 15(1) of the Act, forest trees or Protected Tree Species may not be cut, disturbed, damaged, destroyed and their products may not be possessed, collected, removed, transported, exported, donated, purchased or sold – except under license granted by the relevant authority. Government Notice 35648 of 2012 provides the latest List of Protected Tree Species within the borders of South Africa.
National Environmental Management Act (Act No. 107 of 1998)	The Act is an umbrella act covering broad principles of environmental management which makes provision for three main areas, namely Land Planning and Development, Natural and Cultural Resources Use and Conservation and Pollution Control and Waste Management. In accordance with the Act, sustainable development requires the consideration of all relevant factors, including: • That the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied;

Legislation	Description
	• That the use and exploitation of non-renewable natural resources are conducted in a responsible and equitable manner and takes into account the consequences of the depletion of the resource; and • That the development, use and exploitation of renewable resources and the ecosystems of which they are part of do not exceed the level beyond which their integrity is jeopardised. According to Section 2(r) of the Act, sensitive, vulnerable, highly dynamic or stressed ecosystems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.
National Environmental Management: Protected Areas Act (Act No. 57 of 2003)	The Act focuses on the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural land-and seascapes. The Act addresses inter alia: • The protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural land- and seascapes; • The establishment of a national register of all national, provincial and local protected areas; • The management of those areas in accordance with national standards; and • Inter-governmental co-operation and public consultation in matters concerning protected areas.
National Environmental Management: Biodiversity Act (Act No. 10 of 2004)	The main objective of the act is to provide for the management and conservation of South Africa's biodiversity and to ensure the sustainable use of indigenous biological resources. In addition to regulations on Threatened, Protected, Alien and Invasive Species in South Africa, the Act also identifies Terrestrial and Aquatic Priority Areas and Threatened Ecosystems for biodiversity conservation.

4 TERMS OF REFERENCE

It is understood that the assessment will be submitted as part of the Application for Environmental Authorisation in accordance with the National Environmental Management Act (Act No. 107 of 1998): Environmental Impact Assessment (EIA) Regulations (2014), as amended. As such, the assessment report is completed in accordance with the minimum requirements for specialist assessments as included in Appendix 6 of the EIA Regulations (2014) as well as the protocol requirements associated with Aquatic Assessments. In addition, the assessment will be submitted in support of a Water Use Licence Application in accordance with the National Water Act (Act No. 36 of 1998).

As such, the assessment will be completed in accordance with the requirements of the abovementioned Acts and will focus on the potential impacts that the project may have on the identified aquatic features within the study site. The assessment will make provision for the following regulated requirements:

- Location of the activity within the "regulated area of a watercourse" as defined by the Act;

- An identification of all the aquatic features within the determined “regulated area of a watercourse”;
- A delineation of all these identified aquatic features to determine their extent, the delineation will be conducted in accordance with the Department of Water Affairs and Sanitation’s guideline on the delineation of these features;
- An assessment of the identified aquatic features to determine their hydrogeomorphic classification, their present ecological state (PES), the ecosystem services they provide as well as their ecological importance and sensitivity (EIS);
- Identification of the potential impacts of the proposed activity on the identified aquatic features;
- An impact assessment with the provision of management and mitigation measures; and
- A Risk Assessment Matrix that follows the Department of Water and Sanitation protocols.

In brief, these requirements have as an outcome to achieve the following:

- A methodology of the site visit and techniques used to assess the specific aspects of the site;
- Details of the assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of site plan identifying site alternatives (where applicable);
- An indication of any areas that are to be avoided, including provision of buffers;
- A description of any assumptions made and any uncertainties or gaps in knowledge;
- A description of the findings and potential implications of such findings on the impact of the proposed activities;
- Any mitigation measures for inclusion in the Environmental Management Programme Report (EMPr);
- Any conditions for inclusion in the Environmental Authorisation and the Water Use Licence;
- Any monitoring requirements for inclusion into the EMPr or Water Use Licence; and
- A reasoned opinion whether the activity should be authorised based on the findings of the assessment.

5 ASSUMPTIONS AND KNOWLEDGE GAPS

The following are assumptions made in the completion of the report:

- The assessment of the potential impacts of the proposed development on the aquatic features on the development site is based on the development layout that has been provided. If the development layout is amended, the impact identification and assessment contained in this report may also change.
- The findings of the report are limited to a single day long site visit conducted on 10 April 2024 which is considered to be autumn to early winter. No provision has been made for seasonal visits to the site and is not considered a shortcoming of the report.
- The identification and delineation of the aquatic features that have been assessed within the study area was conducted in terms of the procedures as specified by the Department of Water and Sanitation.
- The classification of any identified aquatic features has been conducted in accordance with the classification system of inland aquatic ecosystem as prescribed by Ollis *et al.,* 2013.
- The following desktop information was used to augment the finding of the assessment:
    - Electronic biodiversity databases managed by the South African National Biodiversity Institute (SANBI);
    - Available provincial electronic biodiversity databases;
    - Wetland and Riparian Habitat Delineation Document (Department of Water and Sanitation report); and
    - Classification system for wetlands and other aquatic ecosystems in South Africa (Inland Systems) (Ollis *et al.*, 2013 – SANBI Biodiversity Series 22).

6 REPORTING CONDITIONS

The following conditions apply to the report in part or as a whole:

- The findings and conclusion of this report are based on the author's scientific and professional knowledge as well as available information at the time of the assessment. In addition, the recommendations made are considered to be the best, implementable actions that can be taken to alleviate the identified impacts.

- As such, the author accepts no liability for any actions, claims, demands, losses, liabilities, costs, damages, and expenses that may arise from or in connection with the services rendered, and by any use of the information contained in this document.
- No part of this report may be amended without written consent from the author.

7 EXPERTISE OF THE SPECIALIST

Mr Magnus van Rooyen is a registered natural scientist with the South African Council of Natural Scientific Professions (SACNASP) and holds a Master's degree in Environmental Management, a BSc Honours degree in Botany and a BSc degree in Botany and Zoology from the University of Stellenbosch. Mr van Rooyen has in excess of 25 years' experience in the field of wetland and terrestrial ecological studies in Southern and Western Africa. The *curriculum vitae* of the specialist, Mr Magnus van Rooyen is attached in Appendix A.

8 METHODOLOGY

The methodology that was followed in completing this study is in line with the requirements and specifications of the Department of Water and Sanitation. In addition, provision was made to conduct an assessment to meet the extended aspects included in the Scope of Works.

8.1 Identification of aquatic features and mapping

The initial identification process for aquatic features was conducted at a desktop level during which available GIS databases were interrogated to determine the presence of any wetland and watercourse areas that have been determined in the past. The key database that was interrogated was the National Freshwater Ecosystem Priority Area (NFEPA) as managed and updated by the South African National Biodiversity Institute (SANBI) as well as the updated version of this dataset, the Wetland MAP5 (2018).

In addition to the database interrogation, the most recent Google Earth and Zoom Earth Imagery of the site was considered to see if any wetland areas or "anomalies" within the site are visible.

Following the desktop assessment of the site, a site visit was conducted on 10 April 2024. During the site visit, the potential aquatic features identified through the desktop assessment were verified and any other aquatic features were identified and their boundaries accurately delineated.

8.2 Aquatic feature delineation

The delineation of these wetlands areas was conducted in accordance with the Department of Water and Sanitation, *"A practical field procedure for identification and delineation of wetlands and riparian areas"* (2005).

This field guide makes use of several specific indicators which show the presence and the boundaries of wetlands. The presence of the following indicators was used during the identification and delineation of the site:

- ***Terrain Unit Indicator*** – Identification of the part of the landscape where wetlands are more likely to occur;
- ***Soil Form Indicator*** – Identification of the soil types which are associated with prolonged and frequent saturation;
- ***Soil Wetness Indicator*** – Identification of the morphological signatures that develop in soil profiles as a result of prolonged and frequent saturation; and
- ***Vegetation Indicator*** – Identification of the hydrophilic vegetation associated with frequently saturated soil.

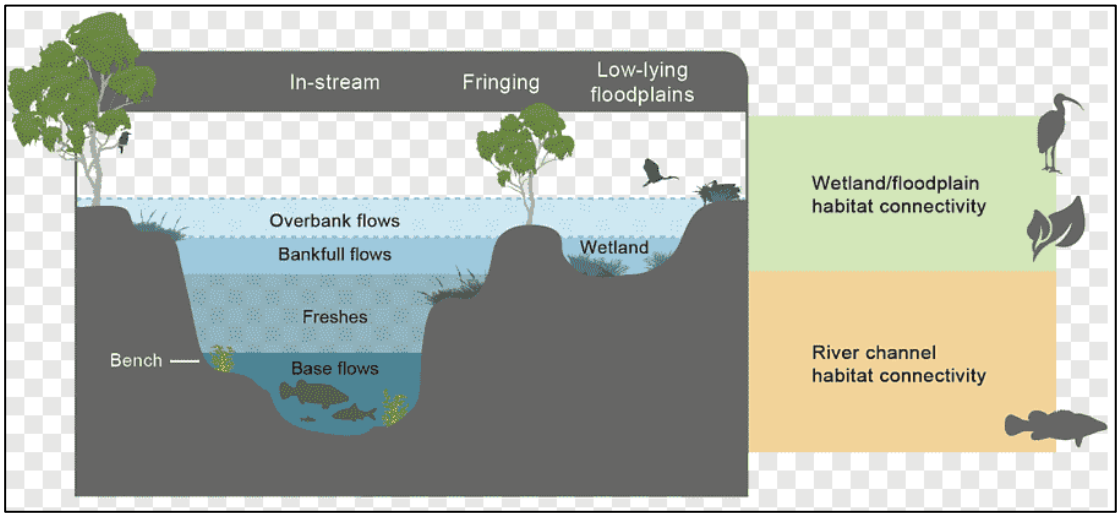
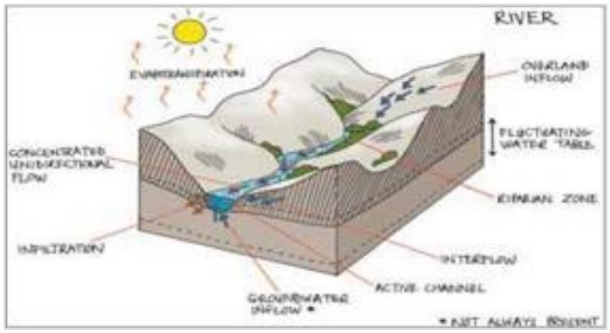
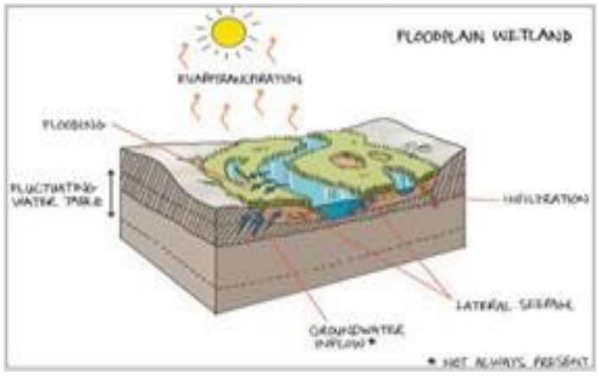
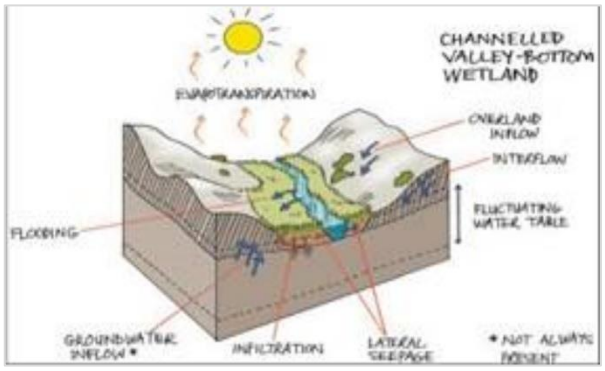
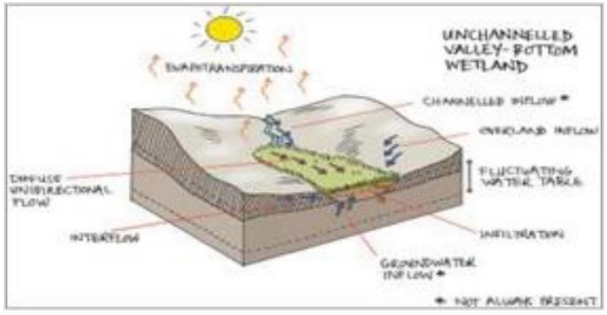
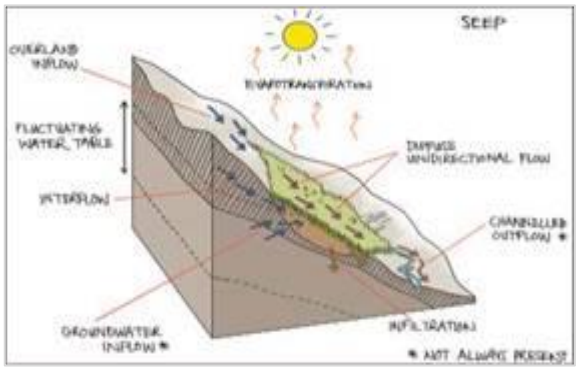
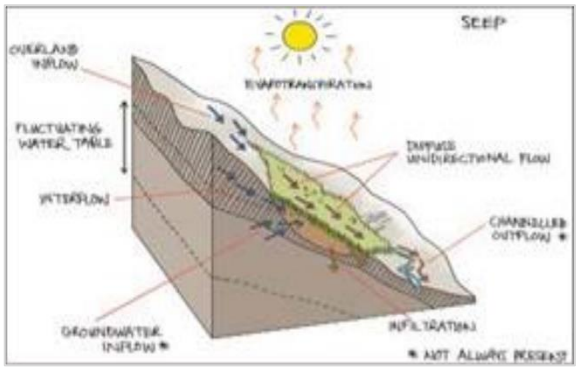
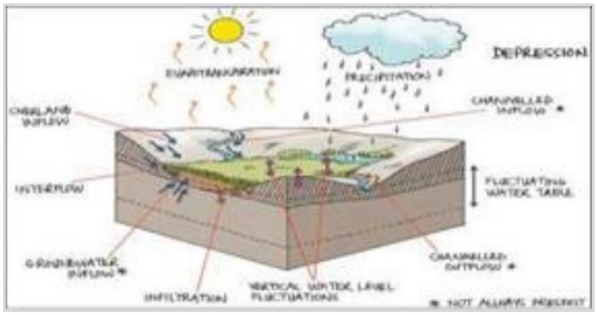
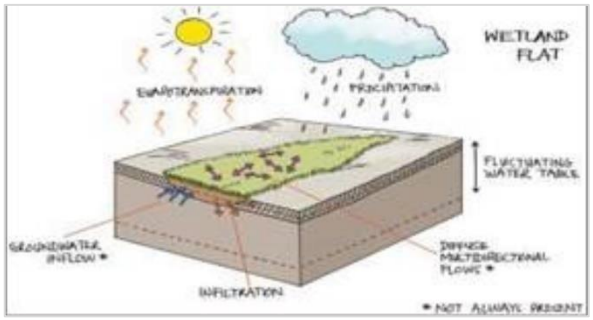


Figure 8-1: Cross section through a typical drainage basin (www.pngegg.com)

Following the identification of the aquatic features on the study site, these are then classified into specific hydrogeomorphic (HGM) units according to the Classification System for Wetlands and other Aquatic Ecosystems in South Africa (inland systems) (Ollis *et al*., 2013).

Table 8-1: Wetland hydrogeomorphic (HGM) types typically supporting inland wetlands in South Africa (Ollis *et al.*, 2013)

Hydrogeomorphic types		Description
River		Rivers are linear landforms with clearly discernible banks and a channel, which permanently or periodically, carries a contained and defined flow of water. A river is taken to include both the active channel and the riparian zone.
Floodplain		Valley bottom areas with a well-defined stream channel, gently sloped and characterised by floodplain features such as oxbow depressions and natural levees and the alluvial (by water) transport and deposition of sediment, usually leading to a net accumulation of sediment. Water inputs from main channel (when channel banks overspill) and from adjacent slopes.
Valley bottom with channel		Valley bottom areas with a well-defined stream channel but lacking characteristic floodplain features. May be gently sloped and characterised by the net accumulation of alluvial deposits or may have steeper slopes and be characterised by the net loss of sediment. Water inputs from main channel (when channel banks overspill) and from adjacent slopes.
Valley bottom without a channel		Valley bottom areas with no clearly defined stream channel, usually gently sloped and characterised by alluvial sediment deposition generally leading to a net accumulation of sediment. Water inputs mainly from channel entering the wetland and also from adjacent slopes.

Hydrogeomorphic types		Description
Hillslope seepage linked to a stream channel		Slopes on hillsides, which are characterised by the colluvial (transported by gravity) movement of materials. Water inputs are mainly sub-surface flow and outflow is usually via a well-defined stream channel connecting the area directly to a stream channel.
Isolated Hillslope seepage		Similar to other hillslope seeps but with no direct surface water connection to a stream channel. Slopes on hillsides, which are characterised by the colluvial (transported by gravity) movement of materials. Water inputs mainly from sub-surface flow and outflow primarily by diffuse sub-surface and/or limited surface flow.
Depression (includes Pans)		A basin shaped area with a closed elevation contour that allows for the accumulation of surface water (i.e. it is inward draining). It may also receive sub-surface water. An outlet is usually absent, and therefore this type is usually isolated from the stream channel network.
Wetland Flat		A flat wetland with no apparent inlet or outlet points. Water is obtained from surface or near surface flows and is lost either by downward percolation or evapotranspiration. May be only seasonal in terms of its wetness and hydromorphic soils may be only weakly developed or else be absent. Vegetation may be the strongest indicator.

8.3 Riparian Delineation

The delineation of the riparian areas was conducted in accordance with the Department of Water and Sanitation document, “A practical field procedure for identification and delineation of wetlands and riparian areas” (2005).

Like wetlands, riparian areas have their own unique set of indicators. It is possible to delineate riparian areas by checking for the presence of these indicators. The riparian delineation process takes the following physical aspects into consideration:

- ***Topography associated with the watercourse*** – The topography is a good rough indicator of the outer edge of the riparian area as the riparian edge is the same as the edge of the macro channel bank.
- ***Vegetation*** – The delineation of riparian areas relies primarily on the vegetative indicators. Using vegetation, the outer boundary of a riparian area must be adjacent to a watercourse and can be defined as the zone where a distinctive change occurs:
    - In species composition relative to the adjacent terrestrial area; and
    - In the physical structure, such as vigour or robustness of growth forms of species similar to that of adjacent terrestrial areas. Growth form refers to the health, compactness, crowding, size, structure and/or numbers of individual plants.
- ***Alluvial soils and deposited material*** – Alluvial soils can be defined as relatively recent deposits of sand, mud, etc. set down by flowing water, especially in the valleys of large rivers. Riparian areas often, but not always, have alluvial soils.

8.4 Aquatic features functional Assessment

Once the aquatic features have been identified and their boundaries determined, the assessment of the ecosystem services these features provide to the hydraulic system that they contribute to, as well as the immediate natural and social environment, was undertaken. An understanding of this functionality of these features contributes directly to the level of importance that is attributed to the specific feature that is developed. The assessment was conducted by using a modelling tool that forms part of the WET-Management Series (issued by the Water Research Commission), WET-EcoServices (Kotze *et al*., 2008).

The WET-EcoServices tool makes provision for the rapid assessment of the ecosystem services provided by an aquatic feature. The process of applying the tool is based on the characterisation of hydrogeomorphic aquatic feature types based on desktop and field assessment and observations of identified and delineated aquatic features. This model, furthermore, considers the biophysical and social conditions around a feature and converts these considerations into a fixed score for a series of defined ecosystem services that the wetland delivers.

- Flood Attenuation
- Streamflow regulation

- Sediment trapping
- Nitrate Assimilation
- Erosion control
- Maintenance of biodiversity
- Provision of harvestable resources
- Cultural significance
- Education and research
- Phosphate assimilation
- Toxicant Assimilation
- Carbon storage (sequestration)
- Provision of water for human use
- Provision of cultivated food
- Tourism and recreation

The maximum score for any service is a value of 4 and the rating of the probable extent of the service is shown in the table below.

Table 8-2: Ecoservices rating of the probable 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

8.5 Determining the Present Ecological State of a water resource

The determination of the present ecological state (PES) of a water resource was conducted by using a tool from the WET-Management Series (issued by the Water Research Commission), the WET-Health (Macfarlane *et al.*, 2008).

This tool is designed to assess the health or integrity of an aquatic feature. The health of the aquatic feature is defined as a measure of the deviation of feature in structure and function from the it's natural reference condition. The tool therefore attempts to assess the hydrological, geomorphological and vegetation impacts that has been imparted on the wetland at the time of assessment.

The overall approach is to quantify the impacts of human activity or clearly visible impacts on the health of the aquatic feature, 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 impact scores and Present State categories are provided in the tables below.

Table 8-3: The magnitude of impacts on wetland functionality (Macfarlane *et al.*, 2008)

Impact Category	Description	Score
None	No Discernible modification or the modification is such that it has no impacts on the wetland integrity	0 to 0.9
Small	Although identifiable, the impact of this modification on the wetland integrity is small.	1.0 to 1.9
Moderate	The impact of this modification on the wetland integrity is clearly identifiable, but limited.	2.0 to 3.9
Large	The modification has a clearly detrimental impact on the wetland integrity. Approximately 50% of wetland integrity has been lost.	4.0 to 5.9
Serious	The modification has a highly detrimental effect on the wetland integrity. More than 50% of the wetland integrity has been lost.	6.0 to 7.9
Critical	The modification is so great that the ecosystem process of the wetland integrity is almost totally destroyed, and 80% or more of the integrity has been lost.	8.0 to 10

The level of impacts on these three parameters is a direct indication of the PES of the aquatic feature as well as its functionality. An aquatic feature that has undergone severe impacts on its hydrology, geomorphology or vegetation or a combination of all three will reflect a low present ecological state while the converse is also true for pristine features. Since hydrology, geomorphology and vegetation are interlinked in the model, their scores are aggregated to obtain the overall PES health score using the formula:

Health = ((Hydrology value x 3) + (Geomorphology value x 2) + (Vegetation value x 2))/7

Table 8-4: Definitions of the PES categories (Macfarlane *et al.*, 2008)

Impact Category	Description	Impact Score Range	Present State Category
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

8.6 Determining the Ecological Importance and Sensitivity of aquatic features

The outcomes of the implementation of the WET-EcoServices tool discussed above, is key in the determination of the ecological importance and sensitivity of aquatic features as the results is a direct indication of the contribution that the feature is making to the hydraulic system with which it is linked. This contribution is linked to the sensitivity of this feature to any possible change and how this will impact on the hydraulic system it is linked to.

8.7 Ecological Classification and Description

The ecological classification and description are direct results of the implementation of the methodology and tools described above as the results of these determinations contribute to the understanding of the ecology of the aquatic feature. The description of the aquatic feature will therefore make provision for a description of the physical attributes of the feature (location, size, etc.), the ecosystem services that it provides, the current ecological state of the feature and the importance of the feature and its sensitivity.

9 DESCRIPTION OF THE STUDY SITE

9.1 Climate

The climatic conditions for the study site are characterised by a humid subtropical climate with hot, humid summers and dry cold winters with frost regularly occurring in the valley bottoms and other low-lying areas. The mean summer temperature for the district is approximately 23ºC with the mean winter temperature being 10ºC. Annual rainfall is estimated at approximately 800mm of rain that primarily falls during the summer months with drizzle characterising the rainfall during autumn and spring. A summary of the climatic conditions for the general area is provided in the figure below.

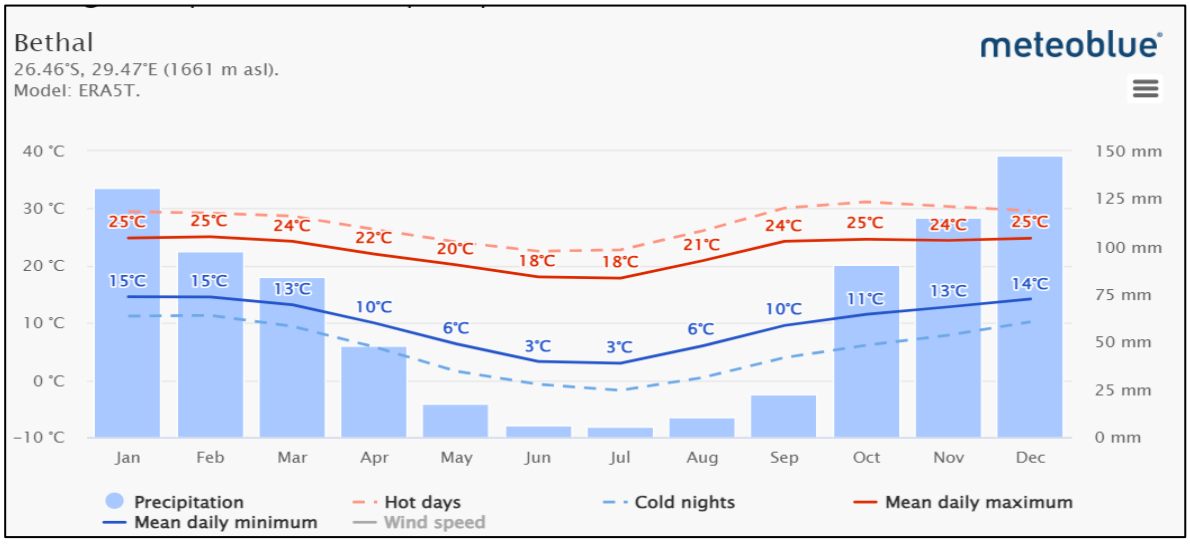


Figure 9-1: Average climatic conditions of the town of Bethal (source www.meteoblue.com)

9.2 Vegetation

The project site is located in the Soweto Highveld Grassland (Gm8) that extends between Ermelo and Johannesburg in the north, Perdekop in the southeast and the Vaal River in the south and westwards as far as Randfontein (see Figure 9-2).

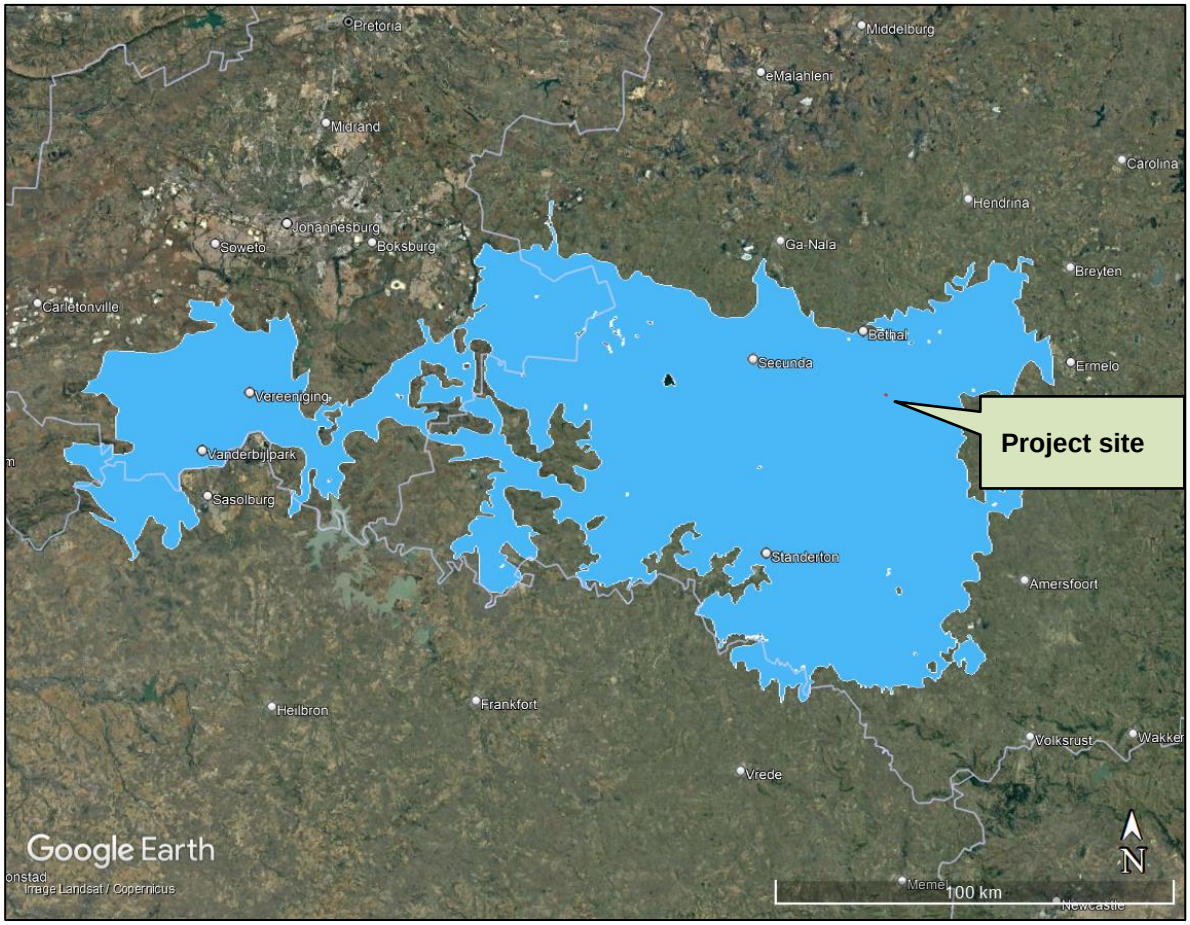


Figure 9-2: Extent of the Soweto Highveld Grassland (Gm8)

The vegetation typically consists of short to medium-high, dense, tufted grassland dominated by *Themeda triandra* (Red Grass) in its pristine state. Other grasses that occur in the vegetation type consists of common *Elionurus muticus* (Wire Grass), *Eragrostis racemosa* (Narrow Heart Love Grass), *Heterpogon contortus* (Spear Grass) and *Tristachya leucothrix* (Hairy Trident Grass).

The vegetation type has an “endangered” classification due to the relatively small percentage (approximately 24%) of the vegetation type that is statutorily conserved. The impacts on the vegetation type are directly linked to cultivation, urban sprawl, mining and building of road infrastructure.

The vegetation on the project site show signs of transformation due to livestock grazing activities and possibly activities associated with the working of the old borrow pit immediately next to the project site. The dominant grass species consists of *Elionurus muticus* (Wire Grass) and *Tristachya leucothrix* (Hairy Trident Grass).

Plate 9-1: View of the vegetation on the project site, looking in a southerly direction

9.3 Topography

The project site is located on a low, east to west ridge line that forms the northern edge of the Heilvleispruit valley. The site is flat and drains in a southerly direction. No significant topographical features occur on the site.

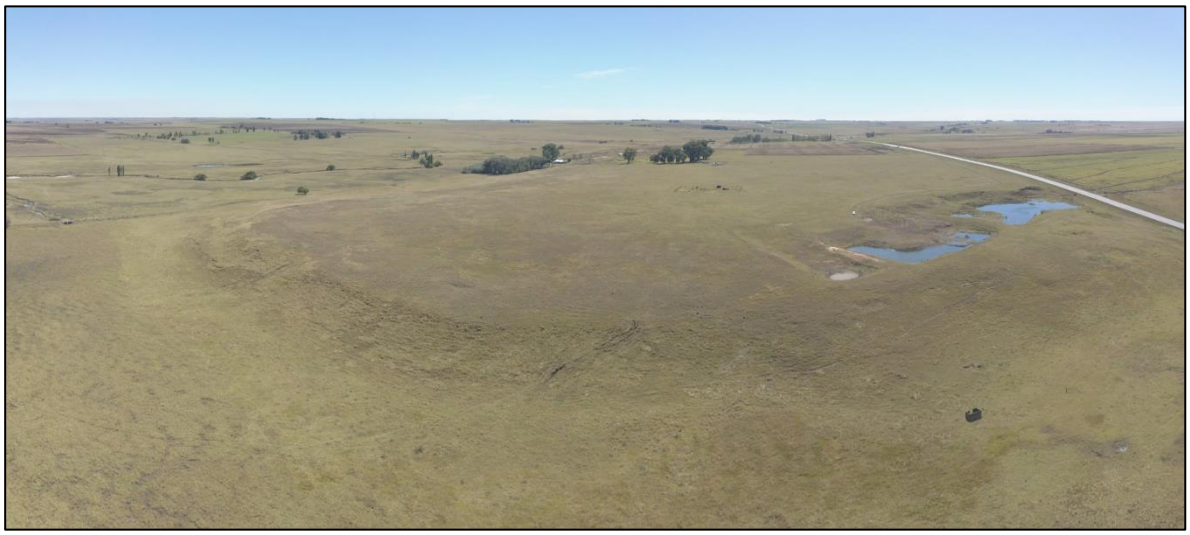


Plate 9-2: Aerial view of the project site showing the topography, looking in a northerly direction

9.4 Land cover and land use

The land use surrounding the project site largely consists of agricultural activities made up of veldt grazing of livestock and cultivation of maize, soyabeans and other crops in rotation. These practices have been present in the surrounding areas for decades. The land use on the project site consists of open veldt grazing. The area has not been ploughed and planted likely due to the presence of the weathered dolerite at surface that covers the majority of the site.

Plate 9-3: View of the weathered dolerite at or near the surface in the project site

Figure 9-3: Dated aerial image (1979) of the project site showing the cultivated areas surrounding the site

10 DESKTOP ASSESSMENT FINDINGS

The findings relating to the terrestrial ecology is based on the desktop assessment of available databases as well as site investigations.

10.1 Department of Forestry, Fisheries and Environment (DFFE) Online Screening Tool

The results generated by the DFFE Online Screening Tool has classified the Aquatic Theme sensitivity to be “LOW” due to the absence of any aquatic features within the project boundaries.

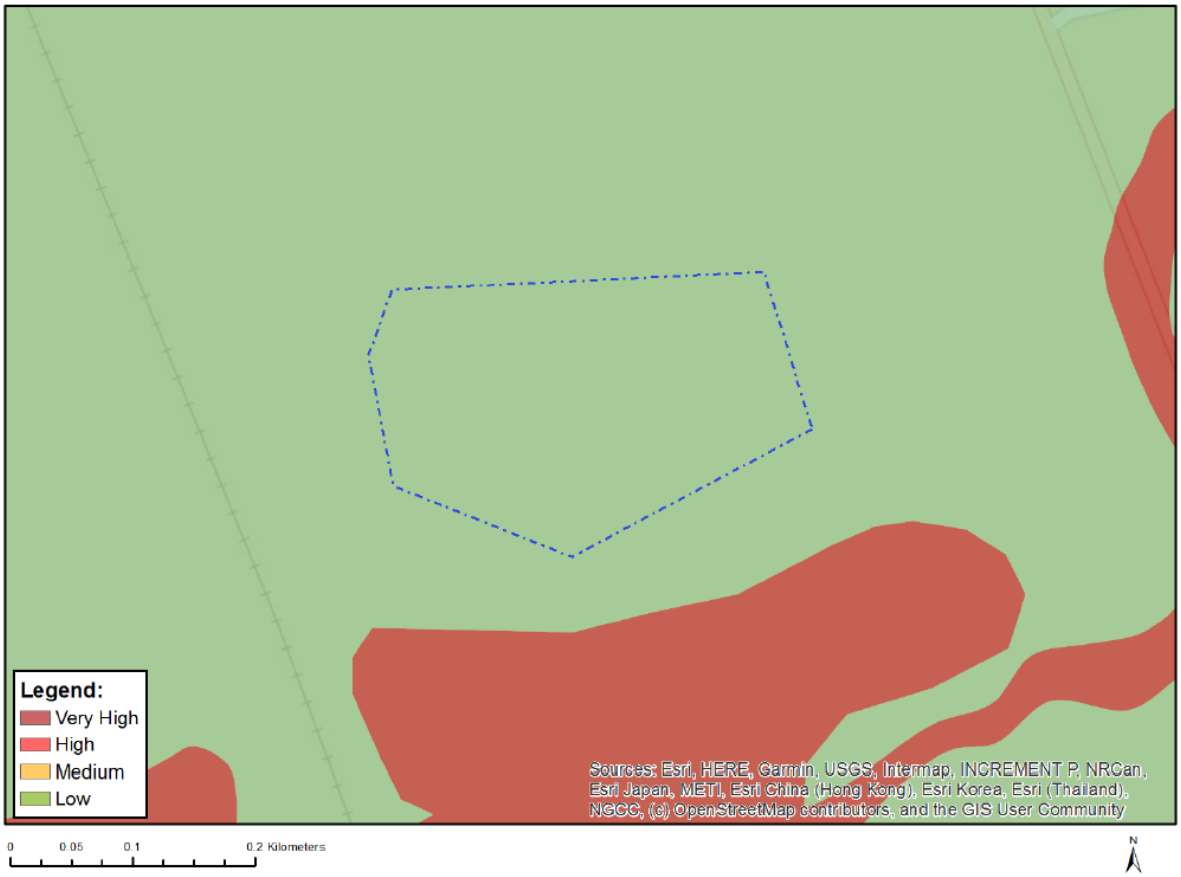


Figure 10-1: Location of the project site in a LOW sensitivity area as per the DFFE Online Screening Tool

10.2 Hydrological setting

The results of the desktop assessment of the hydrological characteristics of the study site are provided in the table below.

Table 10-1: Desktop hydrological characteristics of the study site

Hydrological characteristic	Result	Comment
Water Management Area	Vaal	
Primary Catchment	Primary region C	

Hydrological characteristic	Result	Comment
Tertiary Catchment	C11	
Quaternary Catchment	C11H	The dominant river in the Quaternary Catchment is the Blesbokspruit that drains the catchment in a southerly direction, two unnamed tributaries and the Kwaggalaagte River are identified as NFEPA Rivers in the catchment (see Figure 10-2). All these rivers are considered to be non-perennial rivers. All these NFEPA Rivers are classified as Class C rivers which means that they are considered to be Moderately Modified.

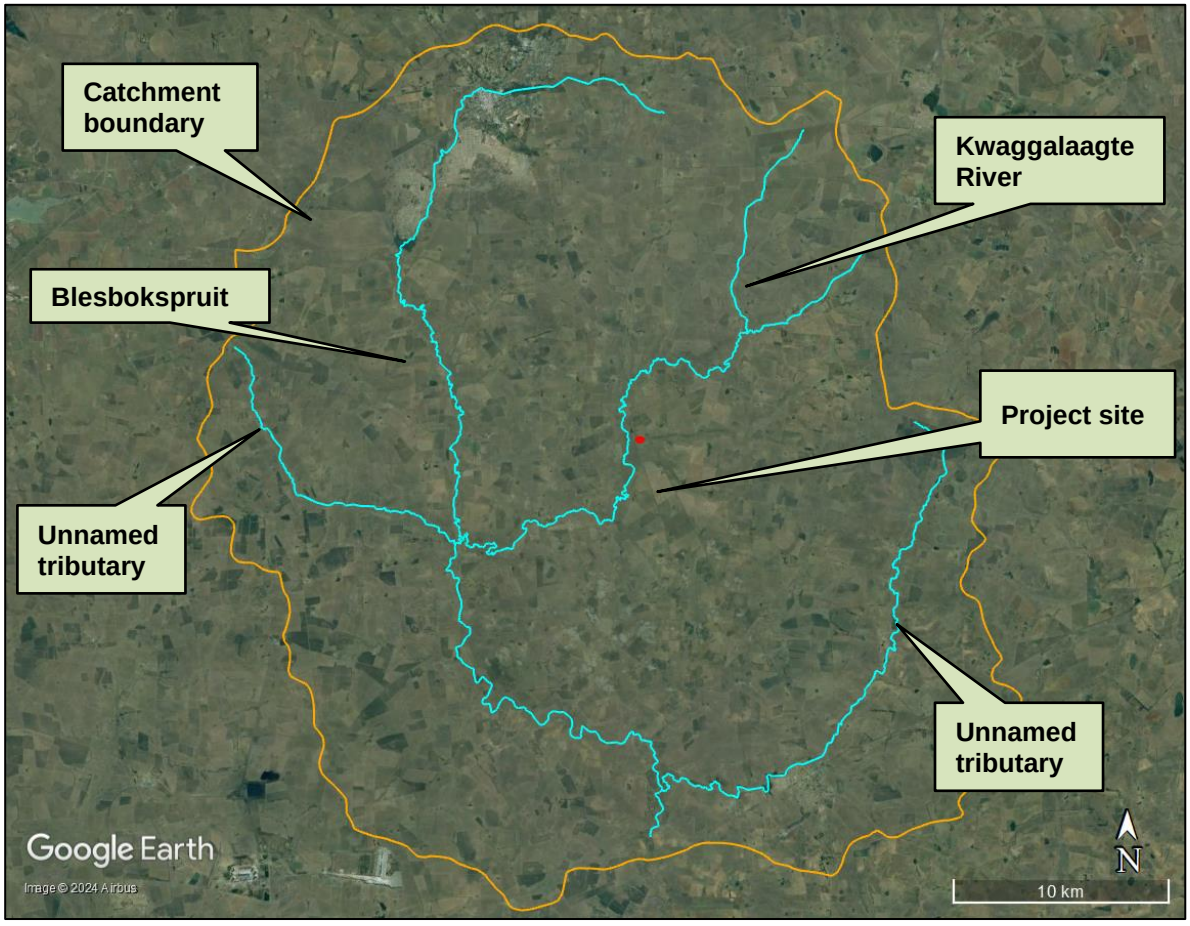


Figure 10-2: Location of the NFEPA Rivers identified in the NFEPA Database for Quaternary Catchment C11H

No NFEPA Rivers were identified to be within the boundaries of the project site.

10.3 National Freshwater Ecosystem Priority Areas (NFEPA)(2014):

The National Freshwater Ecosystem Priority Areas (NFEPA) project provides strategic spatial priorities for conserving South Africa's freshwater ecosystems and supports sustainable use of water resources. The priority areas are called Freshwater Ecosystem Priority Areas, or "FEPAs". The FEPAs were identified based on:

- Representation of ecosystem types and flagship free-flowing rivers;
- Maintenance of water supply areas in areas with high water yield;
- Identification of connected ecosystems;
- Representation of threatened and near-threatened fish species associated with migration corridors;
- Preferential identification of FEPAs that overlapped with:
    - Any free-flowing river;
    - Priority estuaries identified in the National Biodiversity Assessment (2011); and
    - Existing protected area and focus area for protected area expansion identified in the National Protected Area Expansion Strategy.

Based on the above criteria, the database has identified the absence of any wetland features within a 500m radius of the project site. The location of the nearest NFEPA wetland features to the project site is shown in Figure 10-3. Please note that no features are within the boundaries of the project site or within a 500m radius of the project site.

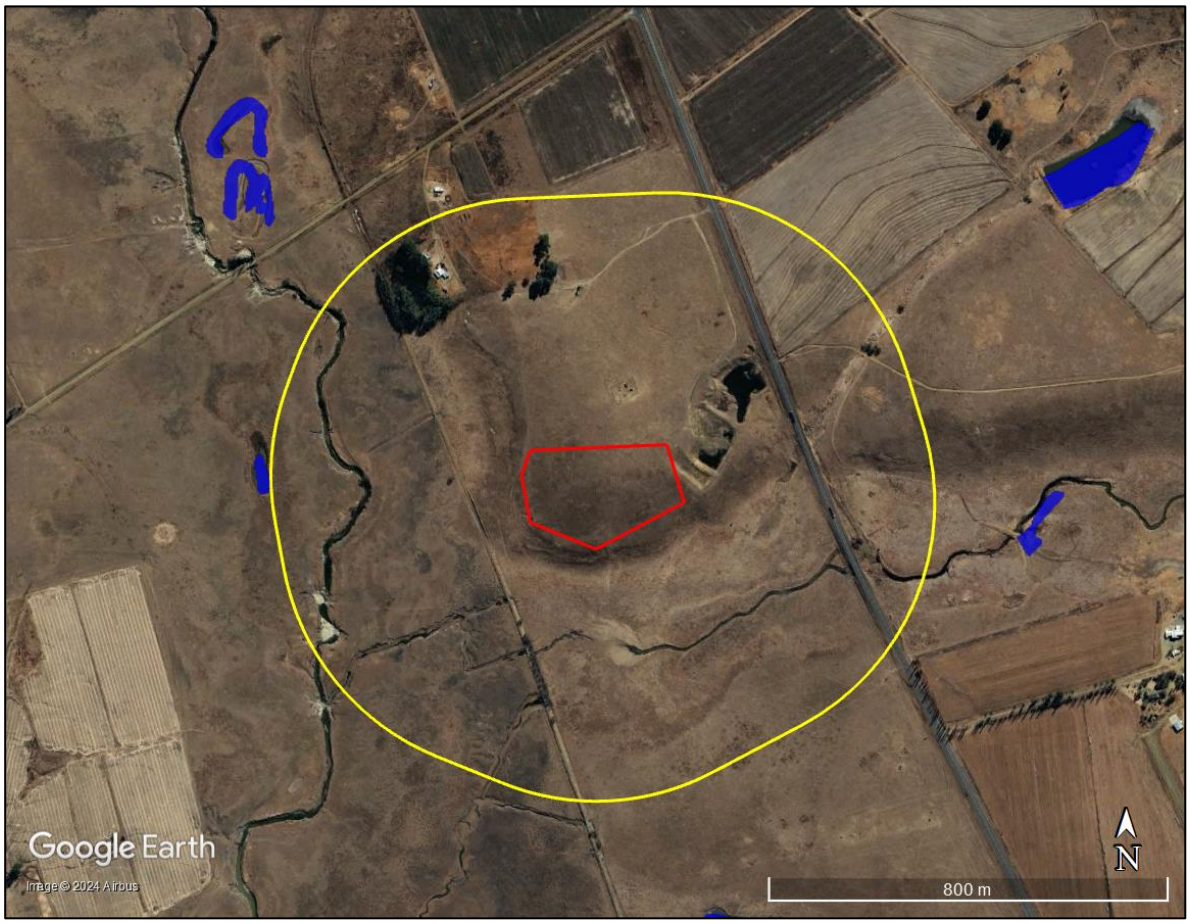


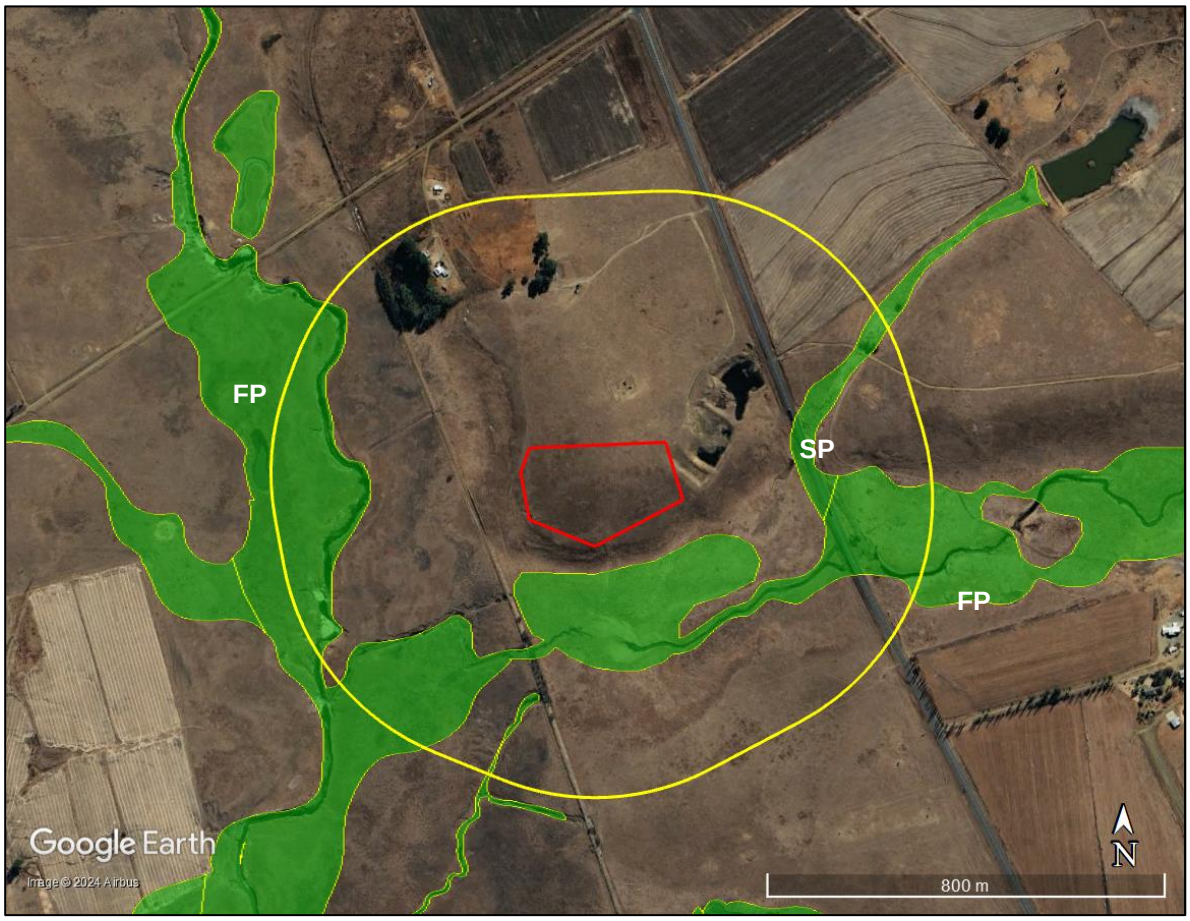
Figure 10-3: Location of the wetland features identified in the NFEPA Dataset (shown in blue) in relation to a 500m radius (shown in yellow) of the project site (shown in red)

10.4 South African Inventory of Inland Aquatic Ecosystems (SAIIAE) (2018)

A South African Inventory of Inland Aquatic Ecosystems (SAIIAE) was established during the National Biodiversity Assessment of 2018 (NBA 2018). The SAIIAE offers a collection of data layers pertaining to ecosystem types and pressures for both rivers and inland wetlands.

The SAIIAE builds on previous efforts while also introducing improvements and several new elements. An inventory of inland aquatic ecosystems responds to a multi-stakeholder need for the planning, conservation and management of these systems, as mandated by a number of Legislative Acts, including the South African National Water Act (NWA) and the National Environmental Management: Biodiversity Act (NEMBA), 2004 (Act 10 of 2004), as amended.

The dataset has indicated the presence of two Flood Plain wetlands one associated with the Heilvleispruit and the other with the Kwaggalaagte River within a 500m radius of the project site. In addition, a small Seep wetland is located to the east of the project site. The location of these features in relation to the project site is shown in Figure 10-4. It is important to note that no wetland features have been identified within the boundaries of the project site.

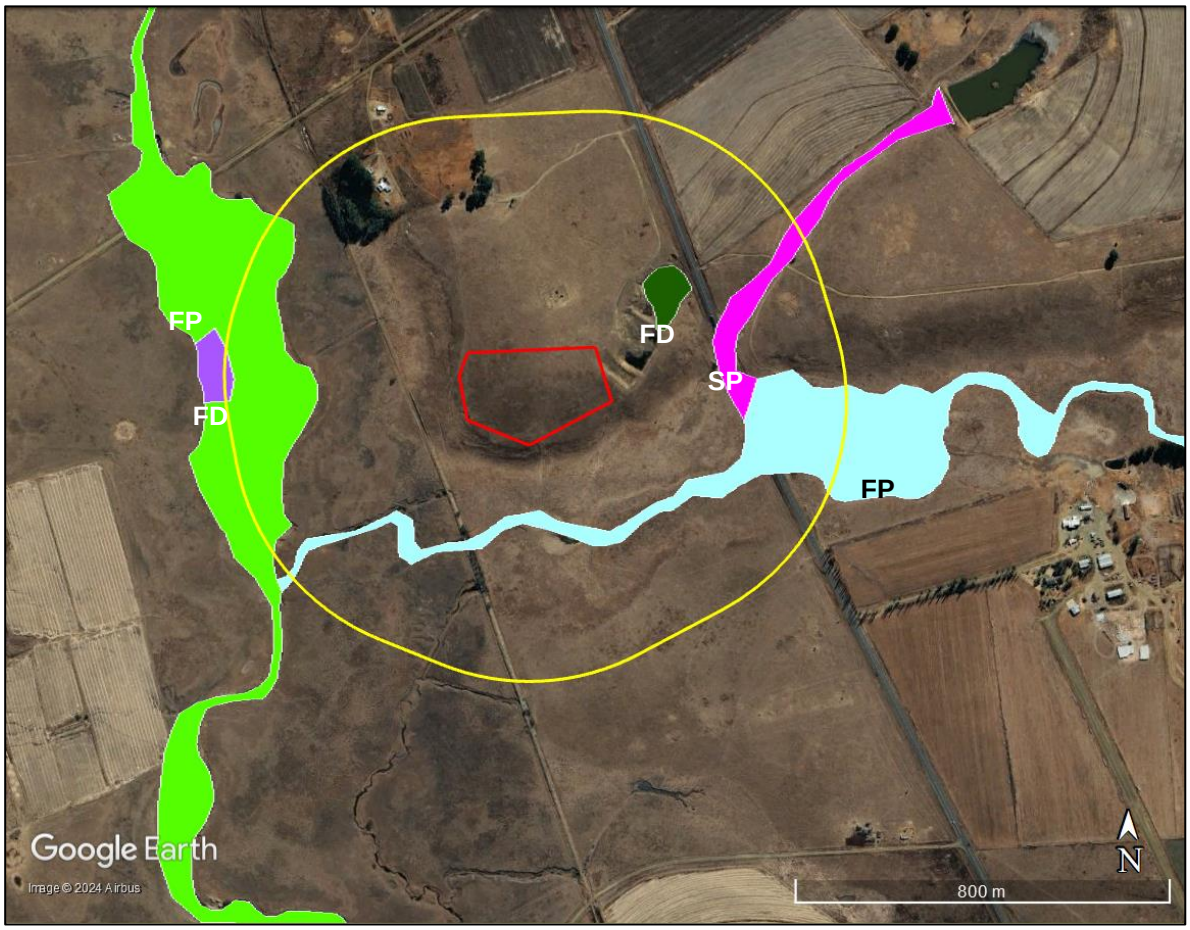


FP = Flood Plain; SP = Seep

Figure 10-4: Location of the wetland features identified in the SAIIAE Dataset (shown in green) in relation to a 500m radius (shown in yellow) of the project site (shown in red)

10.5 Mpumalanga Highveld Wetland Study (2015)

The Mpumalanga Highveld Wetland (MPHG) Wetland map provides that spatial extent of the delineated wetland features in the Mpumalanga Province. This dataset has not identified any wetland features within the boundaries of the project site, but has identified a number of natural and artificial features within a 500m radius of the project site. The natural wetlands are classified as two Flood Plain wetlands and one Seep wetland with the artificial wetlands features consisting of farm dams. The location of these features is shown in Figure 10-5.



FP = Flood Plain; SP = Seep; FD = Farm Dam

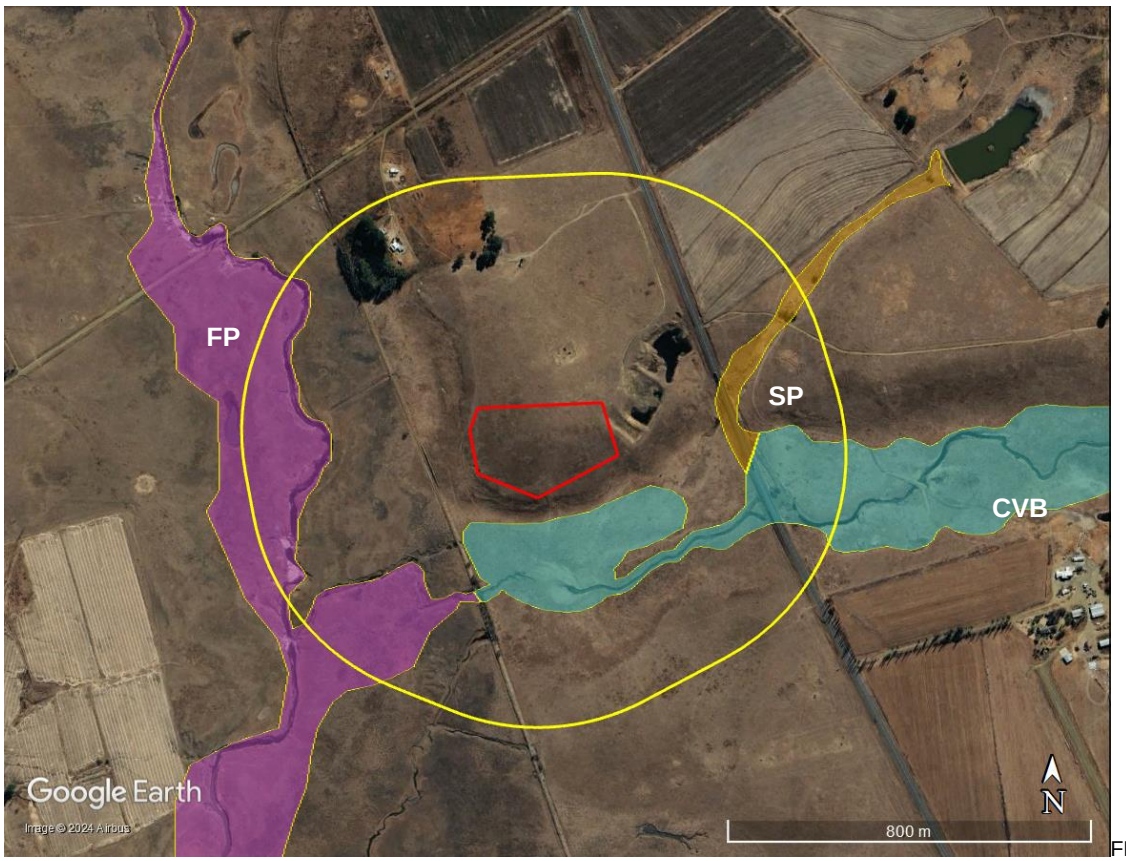
Figure 10-5: Location of the wetland features identified in the MPHG Wetland Dataset (2015)

11 FIELD ASSESSMENT FINDINGS

The findings presented in this section are based on the desktop assessment of the proposed project site.

11.1 Identification, delineation and mapping of aquatic features

The site assessment confirmed the absence of any natural wetland features within the boundaries of the project site. Furthermore, it identified three wetland features, one a Floodplain wetland (FP) associated with the Kwaggalaagte River, one a Channelled Valley Bottom wetland (CVB) associated with the Heilvleispruit and a Seep wetland (SP) within a 500m radius of the project site. The location of these features is indicated in Figure 11-1.



FP = Flood Plain; CVB = Channelled Valley Bottom; SP = Seep

Figure 11-1: Location of the wetland features identified during the field assessment (shown in green) within a 500m radius (shown in yellow) of the development site (shown in red)

Plate 11-1: Aerial view of the Channelled Valley Bottom (CVB) associated with the Heilvleispruit

Plate 11-2: Aerial view of the Flood Plain (FP) associated with the Kwaggalaagte River

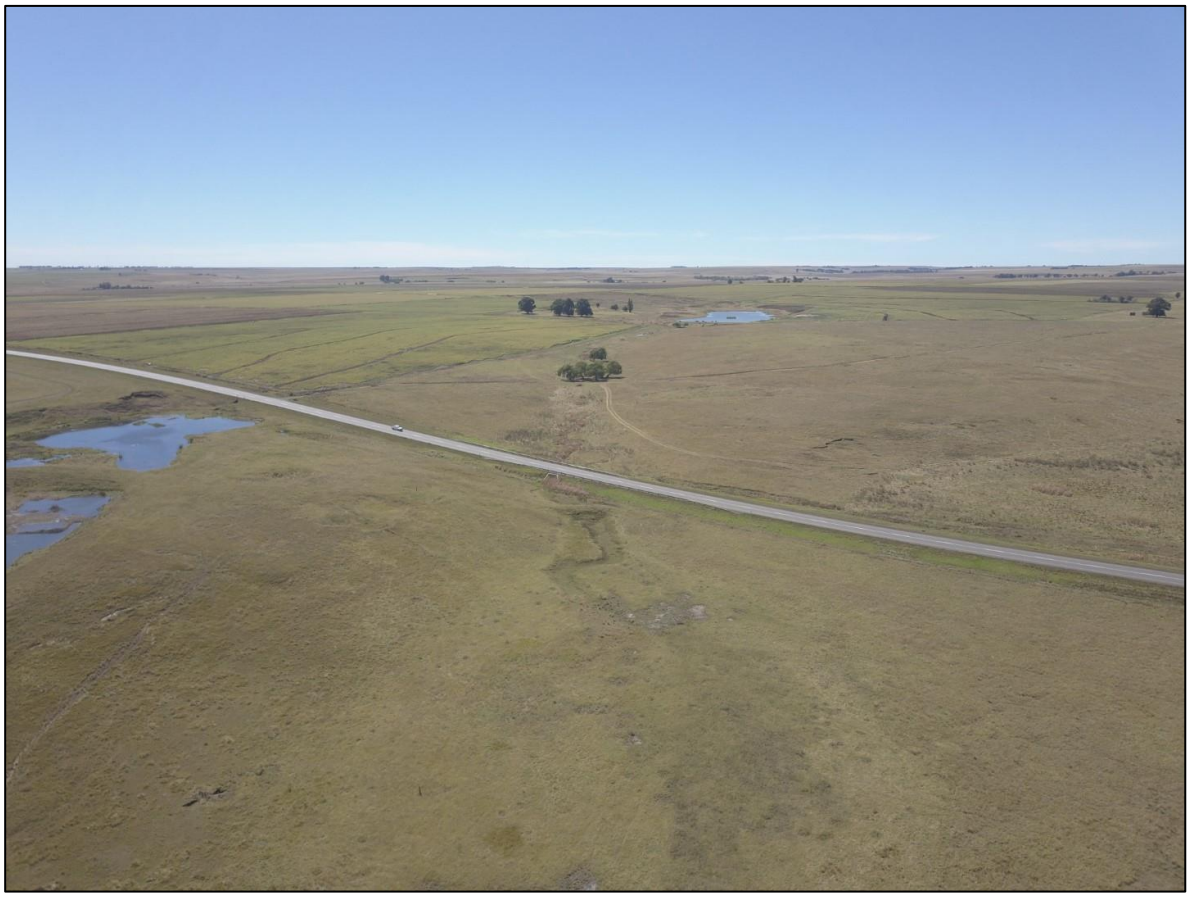


Plate 11-3: Aerial view of the Seep (SP)

No watercourses were identified within the boundaries of the project site. Three seasonal watercourses were identified within a 500m radius of the project site. The one is the Kwaggalaagte River that passes the project site to the west, the other is the Heilvleispruit that is located immediately to the south of the site and the third is the unnamed watercourse that is associated with the Seep. The latter forms a tributary of the Heilvleispruit, which in turn forms a tributary of the Kwaggalaagte River. The location of these watercourses is indicated in Figure 11-2.

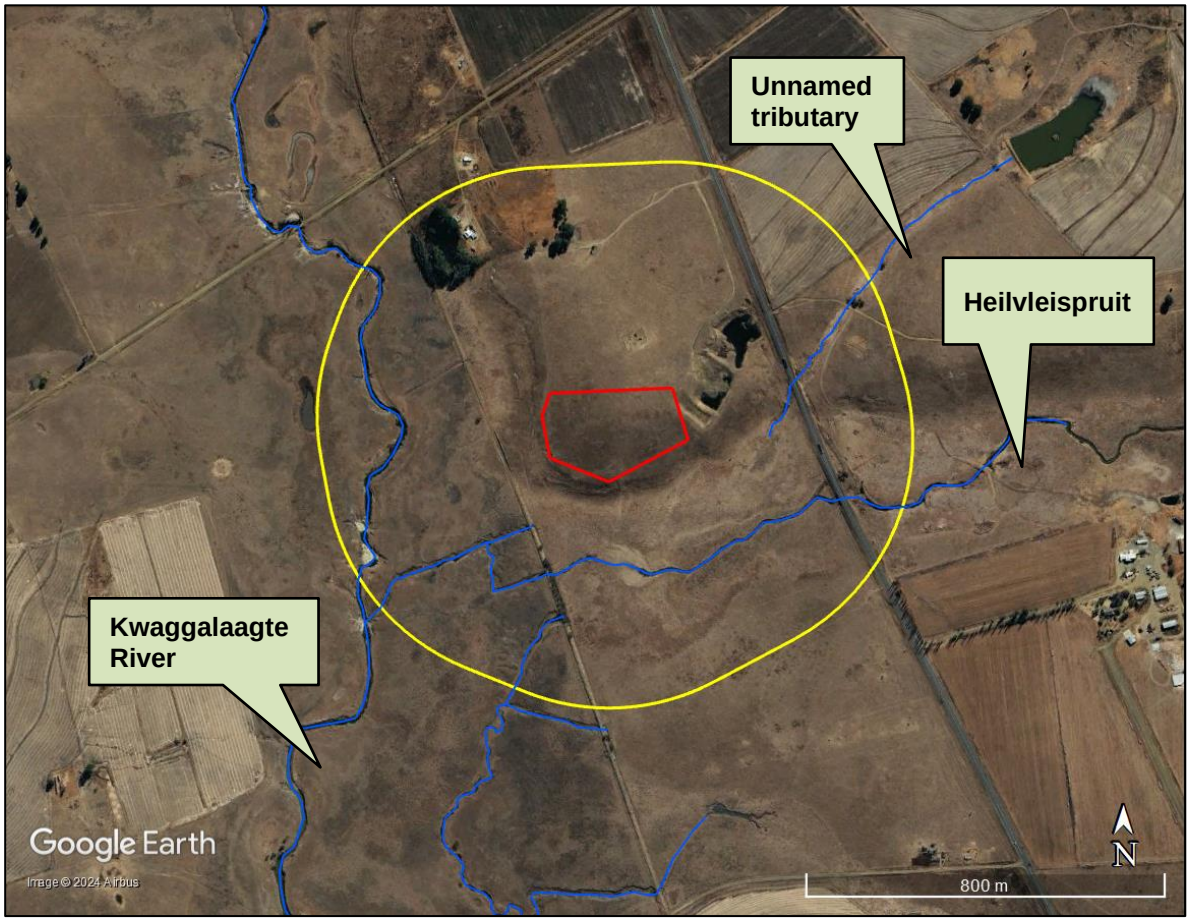


Figure 11-2: Location of the watercourses identified during the field assessment (shown in blue) within a 500m radius (shown in yellow) of the development site (shown in red)

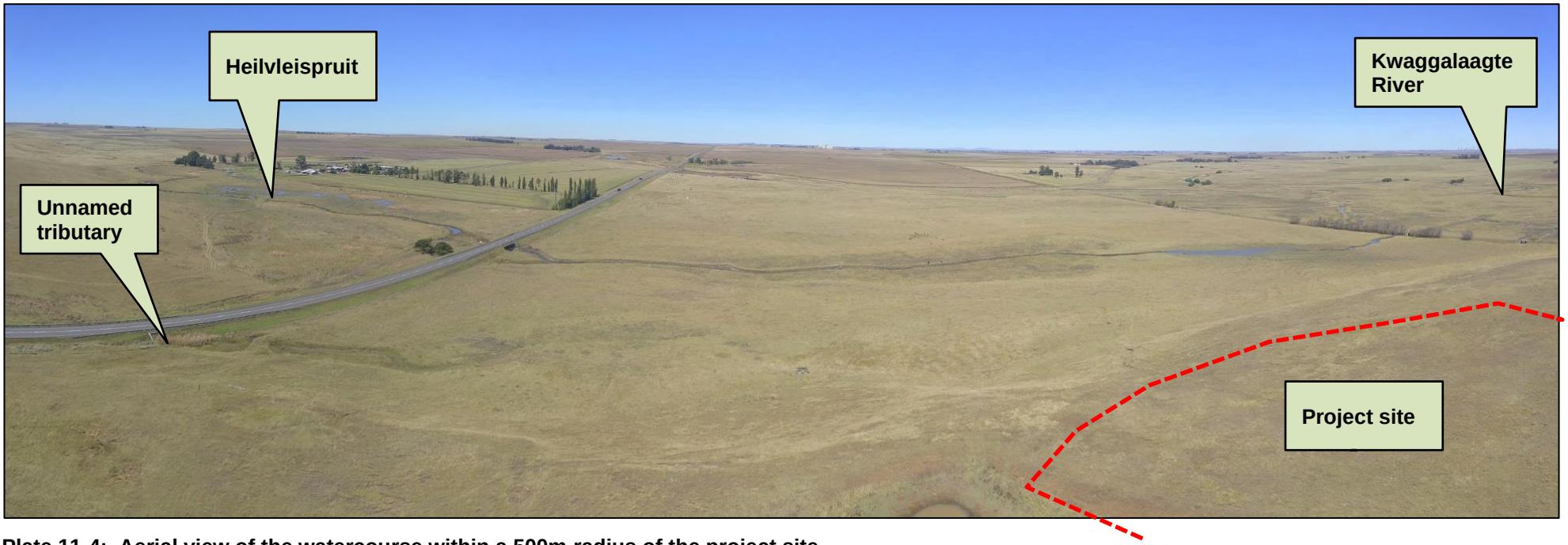


Plate 11-4: Aerial view of the watercourse within a 500m radius of the project site

11.2 Aquatic features functional assessment

The functional assessment of the wetland features all relates to the HGM Unit classification of the wetlands.

Flood Plain wetlands are typical depositional features directly associated with river channels. As such, regular water and sediment contributions from the associated river channel characterises the dynamic nature of these wetlands. The water inputs into these features are largely from the river channel, but also consists of groundwater infiltration where the water table is near the surface. Water loss from these features is via evaporation (and transpiration *via* the plants in the features) as well as infiltration.

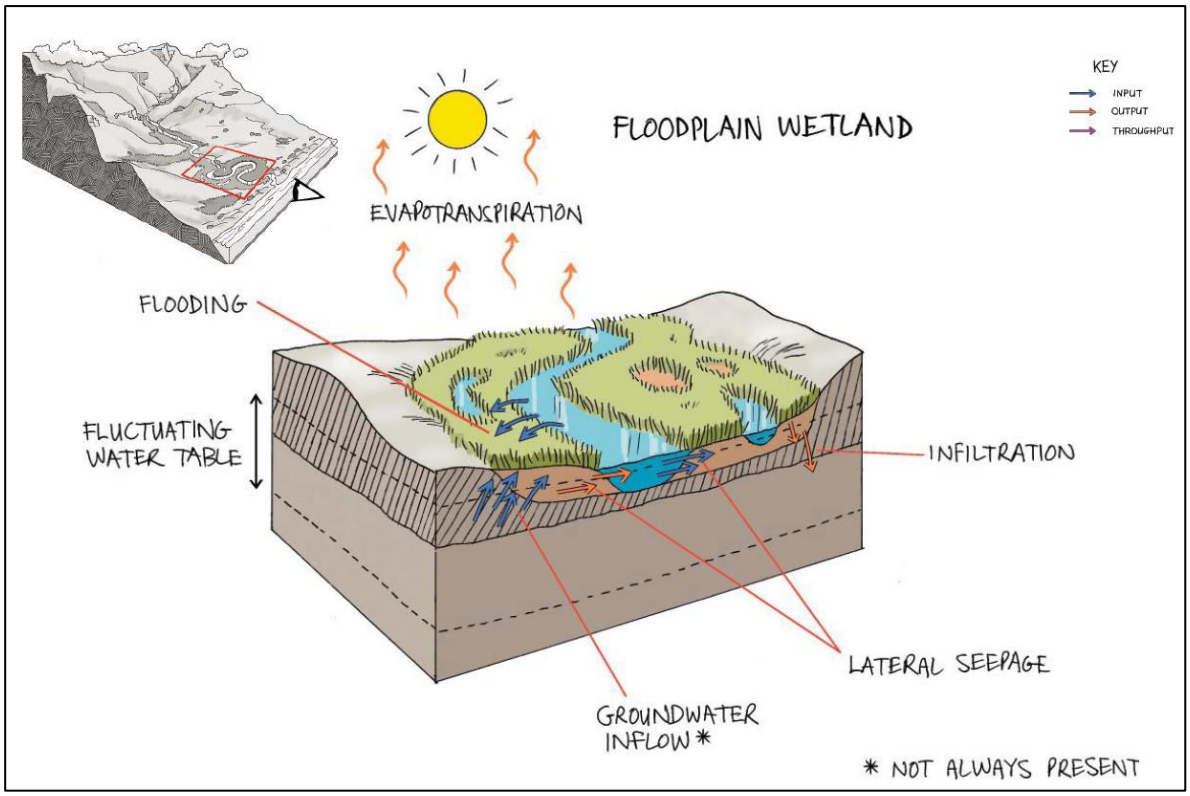


Figure 11-3: Conceptual illustration of a floodplain wetland, showing the typical landscape setting and the dominant inputs, throughputs and outputs of water.

Based on the key features of how water moves in and out of the Flood Plain, these features provide key functions in terms of sediment trapping, toxicant and nutrient assimilation, stream flow control and flood attenuation. The presence of geomorphic features such as oxbow lakes and its direct relationship with a river is a key differentiating feature of these Flood Plains and Channelled Valley Bottom wetlands.

Channelled Valley Bottom wetlands must be considered as wetland ecosystems that are distinct from, but sometimes associated with, the adjacent river channel itself, which must be classified as a 'river'. These wetlands are characterised by their location on valley floors, the absence of characteristic floodplain features and the presence of a river channel flowing through the wetland.

Figure 11-3 is a conceptual diagram of a Channelled Valley Bottom wetland, showing the dominant inputs and outputs of water. Dominant water inputs to these wetlands are from the river channel flowing through the wetland, either as surface flow resulting from flooding or as sub- surface flow, and/or from adjacent valley-side slopes (as overland flow or interflow). Water generally moves through the wetland as diffuse surface flow, although occasional, short-lived concentrated flows are possible during flooding events

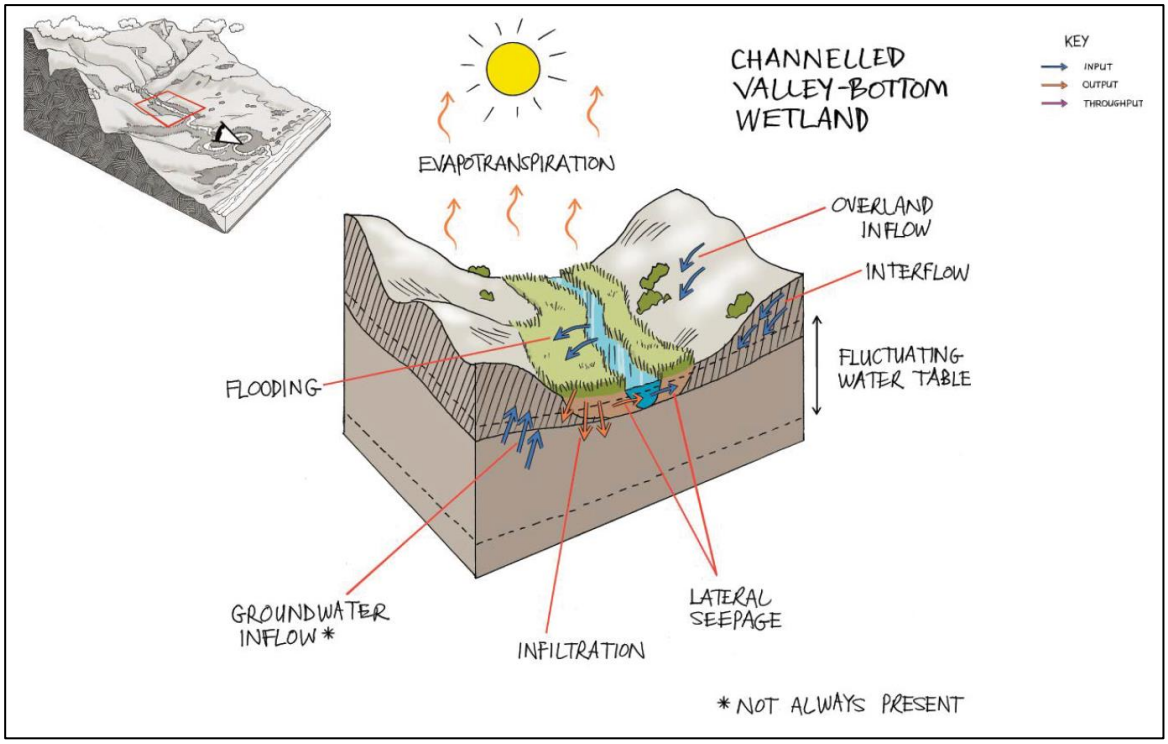


Figure 11-4: Conceptual illustration of a Channelled Valley Bottom wetland, showing the typical landscape setting and the dominant inputs, throughputs and outputs of water

Water generally exits a Channelled Valley Bottom wetland in the form of diffuse surface or subsurface flow into the adjacent river, with infiltration into the ground and evapotranspiration of water from these wetlands also being potentially significant.

Seep wetlands are typically located on gentle slopes and contain no water inflow channels. Water will typically collect in these Seep areas and due to the dense vegetation within the footprint will have a relatively high roughness coefficient that slows the movement of water to a point that infiltration into the soils is a prominent feature of these wetlands. The key water inputs into these Seeps are the interflow from the near surface groundwater that moves down the slopes as well as overland surface flow down the slopes. Evaporation and channelled outflow are key water releases from the features.

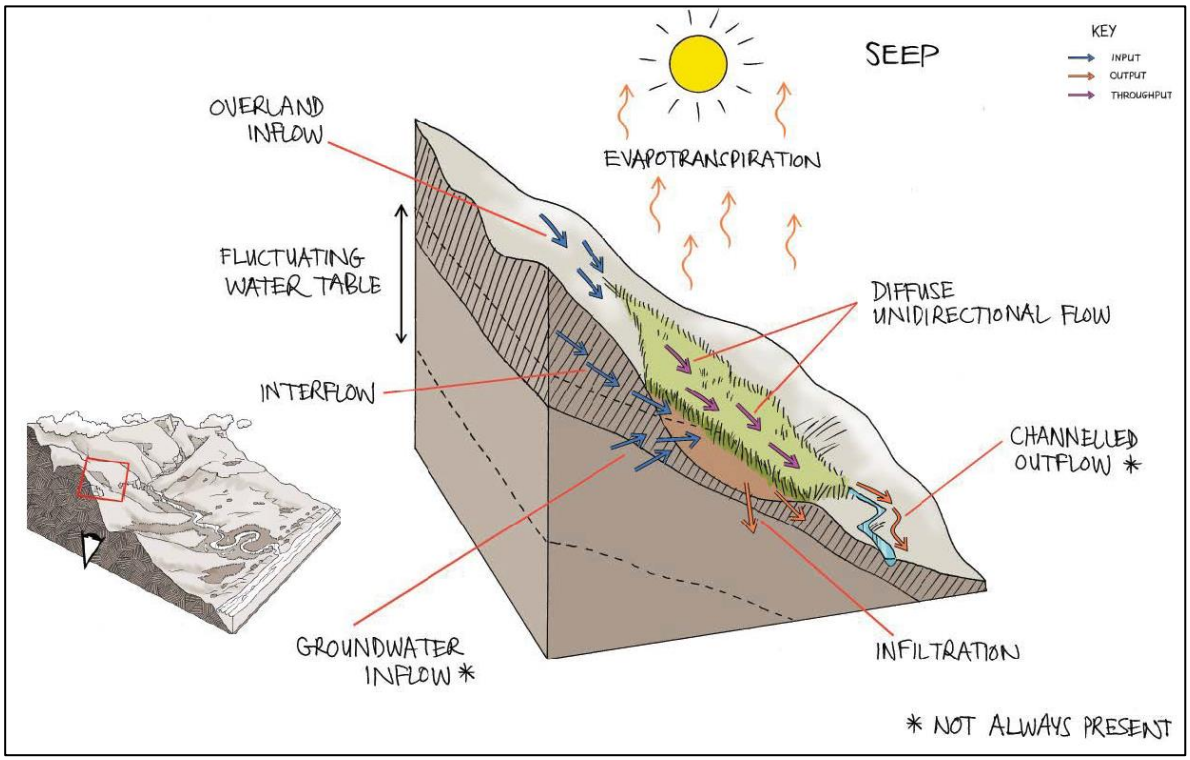


Figure 11-5: Conceptual illustration of a Seep wetland, showing the typical landscape setting and the dominant inputs, throughputs and outputs of water

Based on the hydrological characteristics of these wetlands they provide sediment, toxicant and nutrient storage functions as well as water supply particularly during the dry seasons.

Table 11-1: Ecosystem service provision by the Channelled Valley Bottom Wetlands associated with the project site

Wetland Unit					CVB	FP	SP
Ecosystem Services Supplied by Wetlands	Indirect Benefits	Regulating and supporting benefits	Flood attenuation		2.2	3.2	1.0
			Streamflow regulation		2.4	2.8	0.9
			Water Quality enhancement benefits	Sediment trapping	2.6	3.1	2.2
				Phosphate assimilation	2.2	2.0	2.7
				Nitrate assimilation	2.3	2.0	2.6
				Toxicant assimilation	2.2	2.1	2.4
				Erosion control	2.3	1.8	2.0
			Carbon storage		2.4	2.8	2.4
	Direct Benefits	**Biodiversity maintenance**					
		Provisioning benefits	Provisioning of water for human use		1.8	1.8	1.6
			Provisioning of harvestable resources		0.0	0.0	0.0
			Provisioning of cultivated foods		0.0	0.0	0.0
		Cultural benefits	Cultural heritage		0.0	0.0	0.0
			Tourism and recreation		0.0	0.0	0.0
			Education and research		1.0	1.0	1.0
Overall					**21.4**	**22.6**	**18.8**
Average					**1.53**	**1.61**	**1.34**

FP = Flood Plain; CVB = Channelled Valley Bottom; SP = Seep

The level of service provision by the wetland areas is a direct function of the impacts that are present within and within the catchment that provides water to the wetland. As a result of the impacts to the catchment of the wetland features, the level of ecosystem provision is considered to be of medium importance.

The key ecosystem services provided by the wetland features relate directly their ability to assimilate various substances that move through the catchment. These include nitrates, phosphates and toxicants while the wetlands trap sediment from the catchment which allows for the establishment of dense wetland vegetation that in turn limits the erosion in the features.

11.3 Determining the Present Ecological State of an aquatic feature

The PES of an aquatic feature is a function of the impacts that are present within the footprint of the feature as well as the catchments associated with each of these features and how these impacts affect the drivers of the wetland and watercourse. The impacts that are present in the catchment of the identified wetlands and watercourses are provided in the table below.

Table 11-2: Identified impacts on the aquatic features

HGM unit	Impacts to the catchment	Physical impacts to the wetland
Channelled Valley Bottom	• Intensive commercial agriculture (cultivation) • Civil infrastructure (roads, railway line, power lines, etc.) • Stormwater discharge from the contoured commercial agricultural areas and infrastructure • Alien invasive plant species • Farm dams	• Alien invasive plant species • Several culvert and bridge crossings • Civil infrastructure (roads) • Dam and associated impoundment • Direct stormwater discharge from agricultural areas and infrastructure • Erosion • Canalisation of water flow
Flood Plain	• Intensive commercial agriculture (cultivation) • Civil infrastructure (roads, railway line, power lines, etc.) • Stormwater discharge from the contoured commercial agricultural areas and infrastructure • Alien invasive plant species • Farm dams	• Alien invasive plant species • Several culvert and bridge crossings • Civil infrastructure (railway line, roads) • Dam and associated impoundment • Direct stormwater discharge • Erosion • Canalisation of water flow
Seep	• Intensive commercial agriculture (cultivation) • Civil infrastructure (roads, railway line, power lines, etc.) • Stormwater discharge from the contoured commercial agricultural areas and infrastructure	• Alien invasive plant species • Dam and associated impoundment • Direct stormwater discharge from agricultural areas and infrastructure • Erosion

HGM unit	Impacts to the catchment	Physical impacts to the wetland
	• Alien invasive plant species • Farm dam	
Watercourses	• Intensive commercial agriculture (cultivation) • Civil infrastructure (roads, railway line, power lines, etc.) • Stormwater discharge from the contoured commercial agricultural areas and infrastructure • Alien invasive plant species • Farm dams	• Alien invasive plant species • Several culvert and bridge crossings • Civil infrastructure (railway line, roads) • Dam and associated impoundment • Direct stormwater discharge • Erosion • Canalisation of water flow

Plate 11-5: Aerial view of the road and culvert crossing through the Channelled Valley Bottom

Plate 11-6: Aerial view of the culvert and road crossing the Seep as well as the dam and impoundment area

Plate 11-7: Aerial view of the railway and culvert crossings in the Flood Plain as well as the canalised water flow

Present PES and EIS assessments of watercourses were constrained as no technique is currently suitable for their assessments. Professional opinion and an extrapolation of principles from other methods were used to approximate PES and EIS for watercourse that is present on the study site.

The impacts identified in the table above were used in the Level 1 WET-Health assessment to determine the PES of the wetland system. The results of the Level 1 assessment are provided in the table below.

Table 11-3: Present Ecological State (PES) of the system

HGM Unit	Driver			
	Hydrology	Geomorphology	Vegetation	Combined score
Channelled Valley Bottom	3.1	4.2	4.7	**3.3 = Class C Moderately modified**
Flood Plain	3.5	4.1	4.2	**3.8 = Class C Moderately modified**
Seep	4.1	4.0	3.2	**3.8 = Class C Moderately modified**
Watercourses	4.2	4.3	3.2	**3.9 = Class C Moderately modified**

The PES of all the wetland features included in this study are classified as Class C features that are considered to be moderately modified as a result of the impacts within the catchments as well as within their physical footprints.

The watercourses are classified as Class C features that have been moderately modified which has resulted in moderate changes to the ecosystem processes that has resulted in the loss of natural habitat and biota from the feature.

11.4 Determining the Ecological Importance and Sensitivity of aquatic features

The Ecological Importance of any aquatic feature is an expression of its importance to the maintenance of the ecological diversity and functioning within itself, as well as hydrologically downstream. The Ecological Sensitivity is a function of the system's ability to resist disturbances on its drivers and its capability to recover from these disturbances once they have occurred. The status of the Channelled Valley Bottom wetlands as well as the watercourses within the study site is provided in the table below.

Table 11-4: Ecological importance and sensitivity of the aquatic system

HGM Unit	Criteria	Importance	EIS Class	Overall importance and sensitivity
Channelled Valley Bottom	Ecological importance and sensitivity	2.0	M	**Medium**
	Hydrological/functional importance	2.3	M	
	Direct human benefits	0.5	L	
Flood Plain	Ecological importance and sensitivity	2.1	M	**Medium**

HGM Unit	Criteria	Importance	EIS Class	Overall importance and sensitivity
	Hydrological/functional importance	2.5	M	
	Direct human benefit	0.5	L	
Seep	Ecological importance and sensitivity	1.0	L	**Low**
	Hydrological/functional importance	2.0	M	
	Direct human benefits	0.5	L	
Watercourses	Ecological importance and sensitivity	2.2	M	**Medium**
	Hydrological/functional importance	2.0	M	
	Direct human benefits	0.5	L	

The overall Ecological Importance and sensitivity of the aquatic features associated with the site are presented in Table 11-4. All the features except the Seep wetland have Medium importance and sensitivity with the Seep wetland being classified to have a Low importance and sensitivity. This is a function of the moderately modified PES of the features and the associated intermediate levels of ecosystem services provision by the features.

11.5 Buffer determination

Based on the findings of the assessment, the location and extent of the aquatic features, the PES of the aquatic features, the ecosystem services provided by the system and the EIS of the aquatic features, a buffer of 40m around the edge of the wetland systems is recommended. This buffer must be in place for the duration of the operational phase of the borrow pit.

It is also important to note that in accordance with the Mineral and Petroleum Resources Development Act (Act No. 28 of 2002) no part of the borrow pit operations (stockpiles, crushers, plant parking, etc.) is allowed to be outside of the boundaries of the borrow pit.

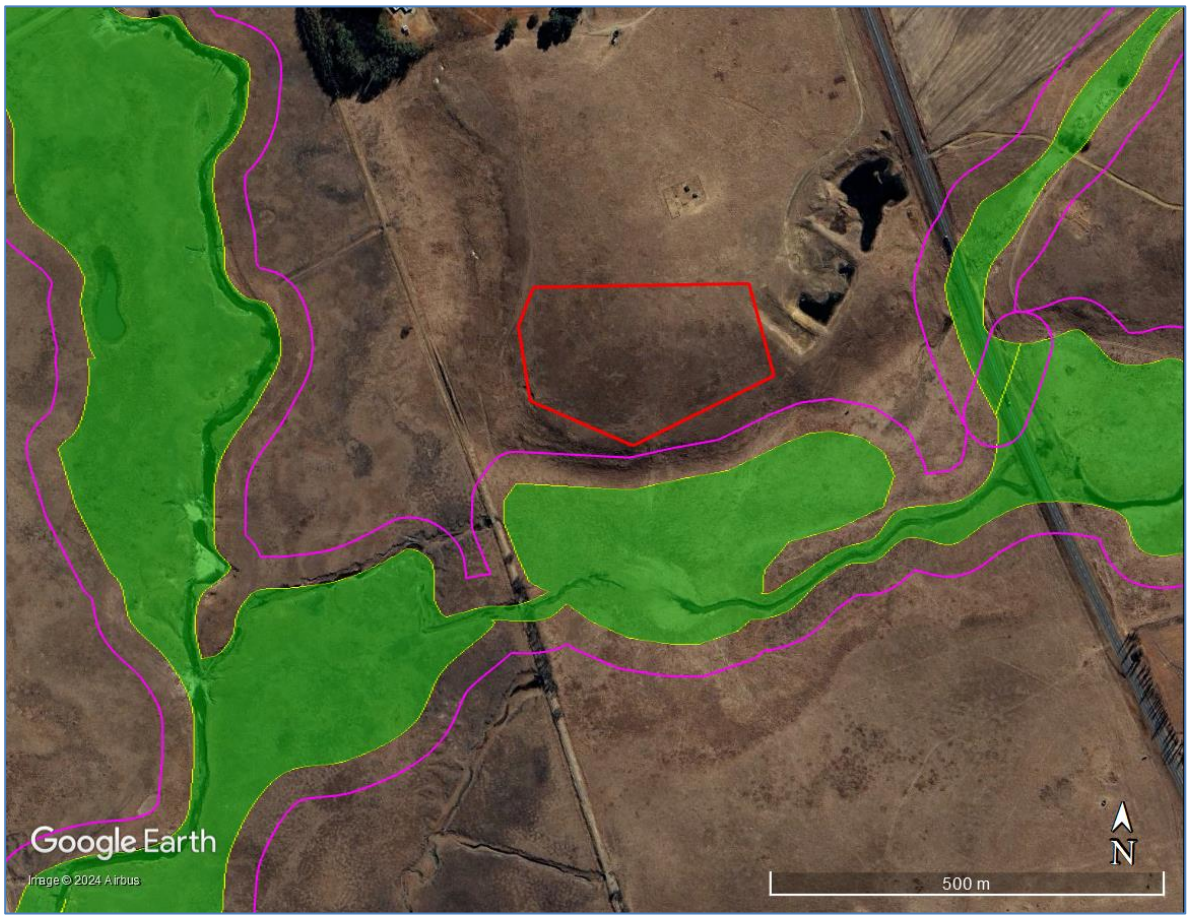


Figure 11-6: Location and extent of the applicable 40m buffer (in purple) around the wetland features nearest to the project site (shown in red)

12 RISK / IMPACT ASSESSMENT

The impact assessment in this report aims to identify and assess the significance of the potential impacts associated with the establishment and operation of the borrow pit. For the purposes of this assessment, the Standardised Risk (or Impact) Assessment Matrix as specified by the Department of Water and Sanitation will be used to assess the impacts in the “regulated area of the watercourse” as defined in the National Water Act (Act No. 36 of 1998).

The ”regulated area of a watercourse” as defined in the Act make provision for the following:

a) 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 or a river, spring, natural channel, lake or dam;

b) In the absence of a determined 1 in 100 year flood line or riparian area the area within 100m from the edge of a watercourse where the edge of the watercourse is the first identifiable annual bank fill flood bench; or

c) A 500m radius from the delineated boundary (extent) of any wetland or pan.

The extent of this “regulated area of a watercourse as it pertains to the Risk Assessment is shown in Figure 12-1. It is clear that the entire borrow pit area falls within the “regulated area of a watercourse” as defined by the regulations.

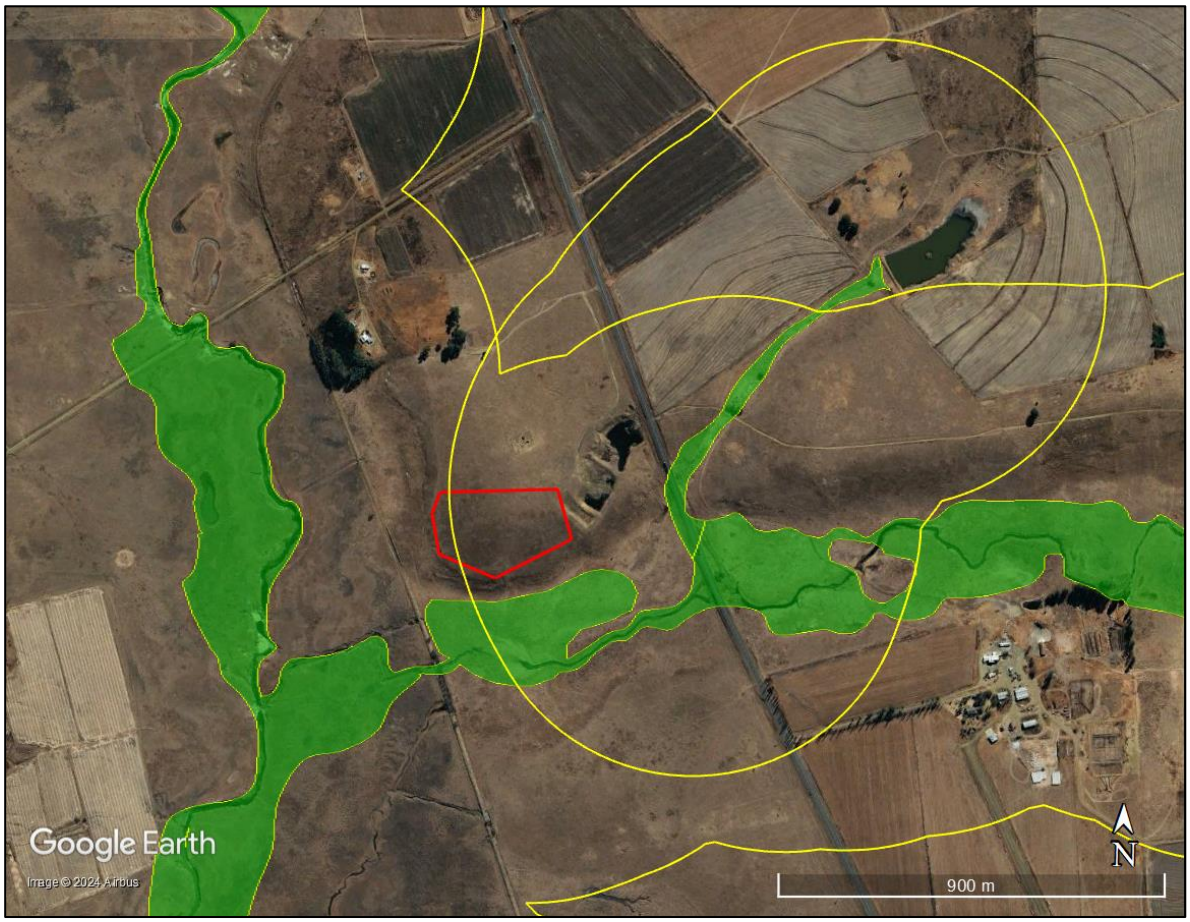


Figure 12-1: Extent of the “regulated area of a watercourse” shown in yellow around the wetland features nearest to the project site

The Risk Assessment Matrix makes provision for the identification of risks at the various phases applicable to the project (establishment and operational) and assesses these to determine the magnitude of the risk / impact to be low, medium or large. Provision is also made for pre- and post-mitigation assessment.

The results of the Risk (or Impact) Assessment Matrix are provided in Table 12-1. The full matrix is provided in Appendix B.

Table 12-1: Results of the Department of Water and Sanitation Risk Assessment Matrix

No.	Phase	Activity	Impact	Risk Rating	Control measures
Pre-mitigation	Establishment and operational	Inadequate stormwater management from the borrow pit area	(1) The changes to the runoff from the areas subjected to the earthworks may impact on the hydrological driver of the aquatic features during the establishment period which could impact on the PES of the features. (2) The removal of vegetation as a result of the earthworks may result in increased levels of silt that is washed into the aquatic features which may impact on the biota in the features. (3) The excavations that are made to open the borrow pit may decrease the amount of runoff from the borrow pit area as the water will accumulate in the excavations. This will impact the hydrological driver of the features which may impact the PES of the features. (4) Higher sediment loads washing of the stockpiles within the borrow pit site may result in an impact on the water quality in the aquatic features which will result in an impact on the PES of these features.	Low Risk	A Stormwater Management Plan must be developed before the establishment of the borrow pit can commence. This management plan must make provision for the following key principles: (1) Diversion of all stormwater runoff from above (north) the borrow pit area around the borrow pit. (2) All stormwater that accumulates in the excavated areas within the borrow pit after rainfall events must be discharged in a controlled manner into the environment. The discharge must be controlled to ensure that the pre-development runoff does not exceed the post-development runoff. (3) Provision must be made for the capturing of any silt that may wash from the material stockpile areas to ensure that the silt is not released directly into the environment. (4) No uncontrolled stormwater runoff must be allowed to the south, east and west of the borrow pit area. (5) The stormwater management plan must be submitted for approval by the Seriti Green.
Post-mitigation				Low Risk	
Pre-mitigation		Risk of hydrocarbon (fuels and oils) contamination of the aquatic features by leaking plant and equipment that will be used for the earthworks and operation of the borrow pit.	Hydrocarbons are toxic to aquatic plants and animals and are readily spread by flowing water.	Low Risk	(1) All plant and equipment that will be used in the construction activities must be inspected on a regular basis to ensure that any leaks are detected as soon as possible. (2) Any leaking plant and equipment must be removed from the construction site and only be allowed to return when the leaks have been addressed. (3) A Spill Contingency Plan must be in place for the duration of the construction phase that details the steps that needs to be taken if spills of various sizes are to occur. (4) No plant or equipment will be allowed to be parked overnight within a 40m buffer from the delineated edge of any aquatic feature.
Post-mitigation				Low Risk	

No.	Phase	Activity	Impact	Risk Rating	Control measures
Pre-mitigation		Storage of hydrocarbons on site, and the inadequate management of petrochemical storage facilities will pose a risk.	Leakages and spillages from the planned petrochemical storage facility may result in the contamination of the existing water quality in the aquatic features	Low Risk	(1) In the event that any hydrocarbon materials are to be stored within the site during the operational phase, provision must be made that the storage facility is fully bunded in a bund that has a volume of 110% of the total volume of hydrocarbons that are stored. (2) The bund must be provided with a closable drainage tap for use when fluid needs to be drained from the bund. (3) The hydrocarbon storage facility may not be located within the 35m buffer from the delineated edge of any aquatic feature. If the edge is not known during the establishment of the storage feature, this must be delineated by an aquatic specialist before implementation. (4) A Spill Contingency Plan must be in place for the construction phase that details the management and mitigation actions that needs to be undertaken in the event of any spillages from the hydrocarbon storage facility.
Post-mitigation				Low Risk	
Pre-mitigation		Risk of contamination of the aquatic features by the on-site ablution facilities.	Spillage or leakage could impact on the water quality that moves through the aquatic features, which could decrease the PES of the features.	Low Risk	(1) All portable ablution facilities that will be used on site must be located 40m away from the edge of the delineated aquatic feature. If the edge is not clearly defined, this must be done by an aquatic specialist before implementation of the ablutions can take place. (2) The portable ablution facilities must be provided with sealed wells in which the sewage is collected. (3) The servicing of these portable ablution facilities must be conducted by a registered service provider who must dispose of the material at a Municipal facility. (4) A Spill Contingency Plan must be put in place to provide the appropriate management and mitigation measures to be implemented in the event of any spillages from these ablution facilities.
Post-mitigation				Low Risk	

13 MANAGEMENT AND MITIGATION MEASURES

The management and mitigation measures as they relate to the risks associated with the aquatic features are provided in Table 12-1. These measures must be included in the Environmental Management Programme Report and Operational Management Plan for the construction and operational phases of the borrow pit.

14 MONITORING REQUIREMENTS

It is recommended that an Environmental Control Officer, who meets the requirements of the NEMA: EIA Regulations (2014) as amended, be appointed to conduct monthly audits of the establishment of the project. An audit report must be completed for each monthly audit and be submitted to the relevant authority.

15 CONCLUSION

The assessment of the DFFE Online Screening Tool has indicated that the Aquatic Theme for the project area has a sensitivity rating of “LOW”. This sensitivity rating can be confirmed as there are no aquatic features within the boundaries of the project site or within a 32m radius of the site.

The entire project site is located within the “regulated area of a watercourse” as defined by the National Water Act (Act No. 36 of 1998). The aquatic features that enact this “regulated area of a watercourse” consist of a Channelled Valley Bottom wetland approximately 55m to the south, a Flood Plain wetland approximately 300m to the west and southwest and a Seep wetland approximately 250m to the east of the project site boundaries. All the watercourses that have been identified in the vicinity of the project site are in excess of 100m from the boundary of the site. The Heilvleispruit channel is approximately 180m to the south of the site, the Kwaggalaagte River approximately 300m to the west and the small unnamed tributary approximately 260m to the east.

The PES of all the wetland areas were classified to be Class C features, which indicates a moderate modification of the features which impacts on their ecosystem service delivery. The habitat within these features is relatively intact and will stay in the same state in the absence of any interventions. The EIS of the features are classified to be of medium (Channelled Valley Bottom and Flood Plain wetlands) and low (Seep wetland) significance and is aligned with the Class C PES.

The potential risks/impacts related to the establishment and operation of the borrow pit are primarily associated with the management of any stormwater runoff from the borrow pit site and as such, the requirement for a Stormwater Management Plan ensuring stormwater separation and control must be put in place. If these risk/impacts are managed appropriately, the risk of the project impacting on the current PES, EIS and ecosystem service status of the features has been determined to be “LOW” risk in accordance with the Department of Water and Sanitation Risk Assessment Matrix as updated in December 2023.

Based on the findings of the assessment, it is the opinion of the specialist that there is no fatal flaw linked to the aquatic features assessed that will prevent the project from being approved. In addition, with the implementation of the control measures (management and mitigation) into the Environmental Management Program Report and Operational Management Plan, any threat that the development may pose to the aquatic environment is nullified.

16 REFERENCES

Department of Water and Sanitation Report – Wetland and riparian habitat delineation document;

Department of Water and Sanitation Report – Risk Assessment Protocol and associated Matrix;

MUCINA, L. and RUTHERFORD, M.C. (eds.), 2006. The Vegetation of South Africa, Lesotho and Swaziland. Strelitzia Publishers.

South African National Biodiversity Institute – Wetland buffer guideline document;

South African National Biodiversity Institute – Classification System for Wetlands and other Aquatic Ecosystems in South Africa (Ollis *et al.*, 2013)

Water Research Commission Report TT659/16 – High Risk Wetland Atlas;

Water Research Commission Report TT339/08 – WET-EcoServices a technique for rapidly assessing ecosystem services supplied by wetlands; and

Water Research Commission Report TT340/08 – WET-Health a technique for rapidly assessing wetland health.

APPENDIX A

SPECIALIST CURRICULUM VITAE

Magnus van Rooyen

Technical Director - Environment

CORE SKILLS

- Environmental Impact Assessment
- Specialist Ecological (Terrestrial and Aquatic) Assessment
- Environmental Screening Assessment
- Due Diligence Assessment and Feasibility Studies
- Mining Applications
- Environmental Management Programmes and Plans
- Strategic Environmental Assessments
- Wildlife Management Plans

DETAILS

Qualifications

- MPil. Environmental Management
- BSc (Hon) Botany
- BSc (Botany and Zoology)
- Post Graduate Certificate in Education (Science and Biology)

Memberships

- South African Council for Natural Scientific Professions (Pr. Sci. Nat. 400335/11)
- International Association of Impact Assessors (Ref No. 1839)

Languages

- Afrikaans - fluent
- English - fluent
- German - fair
- Zulu - communication

Countries worked in:

South Africa, Namibia, Lesotho, Mozambique, Botswana, Guinea, Liberia, United States, United Kingdom

PROFILE

Mr van Rooyen is currently a Technical Director – Environment and the Branch Manager of the KwaZulu-Natal Office of GCS in Durban.

In addition to holding a Masters degree in Environmental Management, he also holds a BSc degree in Botany and Zoology, an Honors degree in Botany and a Post Graduate Certificate in Education. He has in excess of 18 years' experience in the environmental consulting field through conducting and managing Environmental Impact Assessments, Specialist Terrestrial and Aquatic Ecology Assessments and Strategic Environmental Management inputs into various project feasibility studies.

Through these services, he has been exposed to projects in a range of sectors which include the general public infrastructure sector (national and provincial roads, harbour and rail developments, water (dams and supply) and wastewater (treatment works and reticulation), private infrastructure sector (small and large scale housing developments, lodges, private dams, etc.), agricultural sector (dams, establishment of orchards, plantations and feedlots), mining sector (coal mines, gold mine, manganese mines, aggregates and associated mining infrastructure) and the industrial sector (light and heavy industrial infrastructure development).

In addition, Mr van Rooyen has extensive experience in conducting specialist terrestrial and aquatic ecological assessments for various infrastructure (roads, dams, ports) and industrial (smelters, power plants) development projects in a number of diverse ecosystems across Africa. He has experience in the compilation of Resettlement Policy Framework Plans, Due Diligence Assessments and Feasibility Studies associated with infrastructure development projects. Mr van Rooyen has experience in working on various private and public sectors as well as rural and urban environments in various countries

Previous Experience

Client	Project Description	Role/ Responsibility
Private client	**Wetland Assessment for the farm dam on the Farm Compentation near Matatiele** Undertaking of the wetland assessment for the development of an irrigation dam on the Farm Compensation near Matatiele in KwaZulu-Natal.	Wetland Specialist
Senekal Boerdery	**Wetland and Biodiversity Assessment for the Mkuze Township Establsishment** Undertaking of the wetland and biodiversity assessment associated with the township establishment in the town of Mkuze, KwaZulu-Natal.	Wetland and Biodiversity Specialist
WSP Consulting	**Wetland Assessment associated with the establishment of a flood protection berm at the SAPPI Saiccor Mill** Undertaking of the wetland assessment for the construciton of a flood protection berm between the uMkomaas River and the SAPPI Saiccor Mill in KwaZulu-Natal.	Wetland Specialist
Transnet National Ports Authority	**Forest mapping within the Port of Richards Bay** Undertaking of the mapping and classification of all the indigenous forest areas withini the Port of Richards Bay, KwaZulu-Natal.	Biodiverstiy Specialist
RHDHV	**KwaMathanya Water Supply Scheme Wetland Assessment** Undertaking of the wetland assessment of the KwaMathanya water supply scheme near town of Ixopo in KwaZulu-Natal.	Wetland Specialist
Private client	**Brownsdrift Hydropedological Assessment** Undertaking of the wetland and hydropedological assessment associated with the proposed residential developmnet on the site in Browndrift, eThekwini Municipality, KwaZulu-Natal.	Wetland Specialist
GreenScene Environmental	**Wetland and Biodiversity Assessment for a residential property in Pumula** Undertaking of the wetland and biodiversity assessment for the residential development on Lot 967 Pumula, KwaZulu-Natal.	Wetland and Biodiversity Specialist
GreenScene Environmental	**Wetland and Biodiversity Assessment for Lot 962 and 965 Port Edward** Undertaking of the wetland and biodiversity assessment for the residential development on Lot 962 and 965 Port Edward, KwaZulu-Natal.	Wetland and Biodiversity Specialist
Msunduzi Municipality	**Wetland and Biodiversity Assessment for various Military Veterans Housing sites within the Msuduzi Municipality** Undertaking of the wetland and biodiversity assessment for the various sites earmarked for the establishment of residential houses for the Military Veterans in the Msunduzi Municipality, KwaZulu-Natal.	Wetland and Biodiversity Specialist
Private client	**Forest delineation of a private property in Munster** Undertaking of the delineation of the forest margins on the residential property in Munster, KwaZulu-Natal.	Biodiverstiy Specialist

Previous Experience

Client	Project Description	Role/ Responsibility
JG Afrika (Pty) Ltd	**Gunyana Water Supply Scheme Wetland and Biodiviersity Assessment** Undertaking of the wetland and biodiverstiy assessment of the Gunyana community water supply scheme near town of Pomeroy in KwaZulu-Natal.	Wetland and Biodiversity Specialist
GreenScene Environmental	**Wetland and Vegetation Assessment associated with the construction of the Ingwebaba Pedestrian Bridge near Shelly Beach** Undertaking of the wetland and vegetaiton assessment for the construction of the Ingwebaba Pedestrian Bridge near Shelly Beach in KwaZulu-Natal.	Wetland and Biodiversity Specialist
Terratest (Pty) Ltd	**Wetland and Vegetation Assessment associated with the construction of the KwaHlokohloko Rural Water Supply Scheme near Eshowe** Undertaking of the wetland and biodiverstiy assessment of the KwaHlokoloko community water supply scheme near town of Eshowe in KwaZulu-Natal.	Wetland and Biodiversity Specialist
Coastal Macadamias	**Wetland Assessment associated with the development of an irrigation dam for Coastal Macadamias near Ramsgate** Undertaking of the wetland assessment for the development of an irrigation dam for the Coastal Macadamias property near Ramsgate, KwaZulu-Natal.	Wetland Specialist
South African National Roads Agency Limited	**Ballito to Tinley Manor Wetland and Biodiveristy Assessment** Undertaking of the wetland and biodiversity study to support the preliminary design for the upgrade of the N3 between Ballito and Tinley Manor.	Wetland and Biodiversity Specialist
Vale Limitada	**Biodiversity Assessment for the alternative water supply pipeline** Undertaking of the biodiversity assessment to suport the preliminary design of the proposed alternative water supply pipeline at the Moatize Mine in Tete, Mozambique.	Biodiversity Specialist
GIB Consulting Engineers	**Aquadene Wetland Assessment** Undertaking of the wetland assessment for the Aquadene housing development in Richards Bay.	Wetland Specialist
JG Afrika (Pty) Ltd	**Wetland Assessment for the pipeline route for the drought relief pipeline in Laingsburg** Undertakaing of the wetland assessment assocaited with the 25km pipeline route from the watersource to the town of Laingsburg in the Western Cape.	Wetland Specialist
Seche International	**Wetland and Biodiversity Assessment for the proposed new uMgungundlovu Landfill Site** Preliminary wetland and biodiversity assessment for the proposed new uMgungundlovu Landfill site outside of Pietermaritzburgg.	Wetland and Biodiversity Specialist
South African National Roads Agency Limited	**Wetland and Vegetation Assessment associated with the upgrading of the N1 between Heuningspruit and Koppies** Undertaking of the wetland and biodiversity assessment for the upgrading of the N1 between Heuningspruit and Koppies in the Freestate Province.	Wetland and Biodiversity Specialist

Previous Experience

Client	Project Description	Role/ Responsibility
Terratest (Pty) Ltd	**Wetland and Vegetation Assessment associated with the upgrading of the Nelson Mandelar Museum at Qunun** Undertaking of the wetland and vegetation assessment associated with the upgrading of the Nelson Mandela Museum in Qunu in the Eastern Cape Province.	Wetland and Biodiversity Specialist
GreenScene Environmental	**Wetland and Vegetation Assessment associated with the construction of the Ulundi Water Supply Scheme** Undertaking of the wetland and biodiverstiy assessment of the Ulundi water supply scheme near town of Eshowe in KwaZulu-Natal.	Wetland and Biodiversity Specialist
MOZAL	**Biodiversity Assessment for the raw water supply pipeline for the Mozal Aluminium Smelter in Mozambique** Undertkaing of the biodiversity assessment for the raw water supply pipeline from the desalination plant in the Port of Matola to the MOZAL smelter int Boane, Maputo, Mozambique.	Biodiversity Specialist
JG Afrika (Pty) Ltd	**Wetland and Biodiveristy Assessment for various water supply schemes in the Cedarberg Municpality** Undertaking of the wetland and biodiversity assessments for the water supplys schemes for the town of Whupperthal, Clanwilliam and Citrusdal in the Western Cape.	Biodiversity Specialist
uKhozi Environmentalists	**Phalanndwa Coal Mine Biodiversity and Wetland Assessment** Undertaking the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the Phalanndwa Coal Mine Expansion near Delmas.	Wetland and Biodiversity Specialist
Kongiwe Environmental Consultants	**Lephalale Coal Mine Biodiversity and Wetland Assessment** Undertaking the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the Lephalale Coal Mine near Lephalale.	Wetland and Biodiversity Specialist
Nzingwe Consultancy	**Riversdale Coal Mine Wetland Assessment** Undertaking the wetland specialist study in support of the Application for Environmental Authorisation and the Water Use Licence Application for the Riversdale Coal Mine near Vryheid.	Wetland Specialist
WSP Environmental	**SAPPI Saiccor Wetland Assessment** Undertaking the wetland specialist study in support of the Application for Environmental Authorisation for the construction of flood protection	Wetland Specialist

Client	Project Description	Role/ Responsibility
	measures associated with the SAPPI Saiccor Mill, uMkomaas.	
WSP Environmental	**11th Avenue Interchange Wetland Assessment** Undertaking the wetland specialist study in support of the Application for Environmental Authorisation for the construction of the 11th Avenue Interchange, Durban	Wetland Specialist
WSP Environmental	**SAPPI Saiccor Alien Invasive Plant – Risk Assessment** Undertaking of the risk assessment of the presence of various listed category I and II alien invasive plant species on the SAPPI Saiccor Mill site, uMkomaas.	Vegetation Specialist
Environmental Resources Management	**Bhangazi Community Tented Camp Wetland and Biodiversity Assessment** Undertaking of the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the establishment of the Bhangazi Community Tented Camp in the isiMangoliso Wetland Park, St. Lucia.	Wetland and Biodiversity Specialist
South African National Roads Agency Limited	**N3 – Market Road Interchange Wetland and Biodiversity Assessment** Undertaking of the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the upgrading of the N3 – Market Road Interchange, Pietermaritzburg.	Wetland and Biodiversity Specialist
ESKOM SOC	**ESKOM 22 kVA Lines Vegetation Assessments** Undertaking of vegetation assessments for the establishment of various 22kVA electrification lines in KwaZulu-Natal.	Vegetation Specialist
ESKOM SOC	**Tombo to Mafini 300kVA Line Vegetation Assessments** Undertaking of vegetation assessment for the route alignment of the 300kVA high voltage electricity line from the Tombo Substation to Mafini, Port St. Johns.	Vegetation Specialist
Element Consulting Engineers	**Port St. Johns Water Treatment Works Wetland and Biodiversity Assessment** Undertaking of the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the establishment of the Port St. Johns Water Treatment Works, Port St. Johns.	Wetland and Biodiversity Specialist
South African National Roads Agency Limited	**N2 – uMgeni Road Interchange Wetland and Biodiversity Assessment** Undertaking of the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the upgrading of the	Wetland and Biodiversity Specialist

Client	Project Description	Role/ Responsibility
	N2 – uMgeni Road Interchange, Durban.	
South African National Roads Agency Limited	**N2 – Mt Edgecombe Interchange Wetland and Biodiversity Assessment** Undertaking of the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the upgrading of the N2 – Mt Edgecombe Interchange, Durban.	Wetland and Biodiversity Specialist
Afrimat	**Ladysmith Quarry Wetland and Biodiversity Assessment** Undertaking the wetland and biodiversity specialist study in support of the Mining Right Application for the establishment of the Afrimat Quarry, Ladysmith.	Wetland and Biodiversity Specialist
South African National Roads Agency Limited	**N3 – Epworth Road Interchange Wetland and Biodiversity Assessment** Undertaking of the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the upgrading of the N3 – Epworth Road Interchange, Pietermaritzburg	Wetland and Biodiversity Specialist
Millennium Challenge Account - Mozambique	**Nacala Dam rehabilitation Biodiversity Assessment** Undertaking of the biodiversity specialist study in support of the Application for an Environmental Permit for the rehabilitation and raising of the Nacala Dam, Mozambique.	Biodiversity Specialist
WSP Environmental	**SAPPI Ngodwana Mill Expansion Wetland and Biodiversity Assessment** Undertaking of the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the expansion of the Ngodwana Mill, Waterval Boven.	Wetland and Biodiversity Specialist
South African National Roads Agency Limited	**N3 – Chota Motala Road Interchange Wetland and Biodiversity Assessment** Undertaking of the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the upgrading of the N3 – Chota Motala Road Interchange, Pietermaritzburg.	Wetland and Biodiversity Specialist
South African National Roads Agency Limited	**R30 Glen Lyon to Brandfort Wetland and Biodiversity Assessment** Undertaking of the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the upgrading of the R30 between Glen Lyon and Brandfort.	Wetland and Biodiversity Specialist
South African National Roads Agency Limited	**R30 Virginia to Beatrix Mine Wetland and Biodiversity Assessment** Undertaking of the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the upgrading of the R30 between Virginia and Beatrix Mine.	Wetland and Biodiversity Specialist

Previous Experience

Client	Project Description	Role/ Responsibility
Miranda Minerals	**Sesikhona Colliery Wetland and Biodiversity Assessment** Undertaking the wetland and biodiversity specialist study in support of the Mining Right Application for the establishment of the Sesikhona Colliery, Dannhauser.	Wetland and Biodiversity Specialist
Miranda Minerals	**Uithoek Colliery Wetland and Biodiversity Assessment** Undertaking the wetland and biodiversity specialist study in support of the Mining Right Application for the establishment of the Uithoek Colliery, Dundee.	Wetland and Biodiversity Specialist
Miranda Minerals	**Burnside Colliery Wetland and Biodiversity Assessment** Undertaking the wetland and biodiversity specialist study in support of the Mining Right Application for the establishment of the Burnside Colliery, Dundee.	Wetland and Biodiversity Specialist
Ultimate Goal	**Ultimate Goal Colliery Biodiversity Assessment** Undertaking the wetland and biodiversity specialist study in support of the Mining Right Application for the establishment of the Ultimate Goal Colliery, Dundee.	Biodiversity Specialist
Canton Trading	**Taylors Halt Quarry Wetland and Biodiversity Assessment** Undertaking the wetland and biodiversity specialist study in support of the Mining Right Application for the establishment of the Taylor Halt Quarry, Pietermaritzburg.	Wetland and Biodiversity Specialist
South African National Roads Agency Limited	**uMtamvuna Quarry Biodiversity Assessment** Undertaking the biodiversity specialist study in support of the Mining Right Application for the establishment of the SANRAL Quarry, Kokstad.	Biodiversity Specialist

SACNASP

South African Council for Natural Scientific Professions

herewith certifies that

Magnus van Rooyen

Registration Number: 400335/11

is a registered scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)
in the following field(s) of practice (Schedule 1 of the Act)

Environmental Science (Professional Natural Scientist)

Effective **31 August 2011** Expires **31 March 2024**

Chairperson

Chief Executive Officer

To verify this certificate scan this code

APPENDIX B
FULL DWS RISK ASSESSMENT

PROJECT: **Ummbila Emoyeni Borr Pit**

RISK ASSESSMENT MATRIX for Section 21 (c) and (i) Water Use activities - Version 2.1

Name of Assessor: Magnus van Rooyen

SACNASP Registration Number: 400335/11

Date of assessment: Aug-24

Signature:

Risk to be scored for all relevant phases of the project (**factoring in specified control measures**). MUST BE COMPLETED BY SACNASP PROFESSIONAL MEMBER REGISTERED IN AN APPROPRIATE FIELD OF EXPERTISE.

No.	Phase	Activity	Impact	Potentially affected watercourses			Intensity of Impact on Resource Quality					Overall Intensity (max = 10)	Spatial scale (max = 5)	Duration (max = 5)	Severity (max = 20)	Importance rating (max = 5)	Consequence (max = 100)	Likelihood (Probability) of impact	Significance (max = 100)	Risk Rating
				Name/s	PES	Overall Watercourse Importance	Abiotic Habitat (Drivers)			Biota (Responses)										
							Hydrology	Water Quality	Geomorph	Vegetation	Fauna									
Pre-mitigation	Establishment and operational	Inadequate stormwater management form the borrow pit area	(1) The changes to the runoff from the areas subjected to the earthworks may impact on the hydrological driver of the aquatic features during the establishment period which could impact on the PES of the features. (2) The removal of vegetation as a result of the earthworks may result in increased levels of silt that is washed into the aquatic features which may impact on the biota in the features. (3) The excavations that are made to open the borrow pit may decrease the amount of runoff from the borrow pit area as the water will accumalate in the excavations. This will impact the hydrological driver of the features which may impact the PES of the features. (4) Higher sediment loads washing of the stockpiles within the borrow pit site may result in an impact on the water quality in the aquatic features which will result in an impact on the PES of these	Channelled Valley Bottom, Flood Plain, Seep and Watercourses	C	Moderate	2	2	2	2	2	**4**	3	2	**9**	**3**	**27**	40%	**10.8**	**L**
Post-mitigation				Channelled Valley Bottom, Flood Plain, Seep and Watercourses	C	Moderate	2	2	2	2	2	**4**	3	2	**9**	**3**	**27**	40%	**10.8**	**L**
Pre-mitigation		Risk of hydrocarbon (fuels and oils) contamination of the aquatic features by leaking plant and equipment that will be used for the earthworks and operation of the borrow pit.	Hydrocarbons are toxic to aquatic plants and animals and are readily spread by flowing water.	Channelled Valley Bottom, Flood Plain, Seep and Watercourses	C	Moderate	2	2	2	2	2	**4**	3	2	**9**	**3**	**27**	40%	**10.8**	**L**
Post-mitigation				Channelled Valley Bottom, Flood Plain, Seep and Watercourses	C	Moderate	2	2	2	2	2	**4**	3	2	**9**	**3**	**27**	40%	**10.8**	**L**
Pre-mitigation		Inadequate management of petrochemical storage facilities	Leakages and spillages from the planned petrochemical storage facility may result in the contamination of the existing water quality in the aquatic features	Channelled Valley Bottom, Flood Plain, Seep and Watercourses	C	Moderate	2	2	2	2	2	**4**	3	2	**9**	**3**	**27**	40%	**10.8**	**L**
Post-mitigation				Channelled Valley Bottom, Flood Plain, Seep and Watercourses	C	Moderate	2	2	2	2	2	**4**	3	2	**9**	**3**	**27**	40%	**10.8**	**L**
Pre-mitigation		Risk of contamination of the aquatic features by the on-site ablution facilities.	Spillage or leakage could impact on the water quality that moves through the aquatic features, which could decrease the PES of the features.	Channelled Valley Bottom, Flood Plain, Seep and Watercourses	C	Moderate	2	2	2	2	2	**4**	3	2	**9**	**3**	**27**	40%	**10.8**	**L**
Post-mitigation				Channelled Valley Bottom, Flood Plain, Seep and Watercourses	C	Moderate	2	2	2	2	2	**4**	3	2	**9**	**3**	**27**	40%	**10.8**	**L**
Pre-mitigation		Risk of increasing sediment loads within the aquatic features as a result of runoff from the material stockpiles within the borrow pit site.	Higher sediment loads could impact on the aquatic biodata in the aquatic features which can further reduce the PES of these features.	Channelled Valley Bottom, Flood Plain, Seep and Watercourses	C	Moderate	2	2	2	2	2	**4**	3	2	**9**	**3**	**27**	40%	**10.8**	**L**
Post-mitigation				Channelled Valley Bottom, Flood Plain, Seep and Watercourses	C	Moderate	2	2	2	2	2	**4**	3	2	**9**	**3**	**27**	40%	**10.8**	**L**

2 Impunzi Place
Kloof
KwaZulu-Natal
3640

Tel: +27 83 556 4087
Email: info@ecolinksa.co.za

WETLAND AND AQUATIC ASSESSMENT ASSOCIATED PROPOSED BORROW PIT NEAR THE TOWN OF BETHAL, MPUMALANGA PROVINCE

Version – Final

August 2024

Project Number: 24-0016

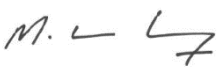
Client Reference:

WETLAND AND AQUATIC ASSESSMENT ASSOCIATED PROPOSED BORROW PIT NEAR THE TOWN OF BETHAL, MPUMALANGA PROVINCE

Version – Final

August 2024

DOCUMENT ISSUE STATUS

Report Issue	Final		
Ecolink Reference Number	24-0016		
Client Reference	23-0766		
Title	**WETLAND AND AQUATIC ASSESSMENT ASSOCIATED PROPOSED BORROW PIT NEAR THE TOWN OF BETHAL, MPUMALANGA PROVINCE**		
	Name	**Signature**	**Date**
Author	Magnus van Rooyen		August 2024
Director	Magnus van Rooyen		August 2024

CONTENTS PAGE

LIST OF FIGURES

LIST OF TABLES

LIST OF PLATES

Declaration

I, Magnus van Rooyen, in my capacity as a specialist consultant, hereby declare that I:

- Act as an independent consultant;
- Do not have any financial interest in the undertaking of the activity, other than remuneration for the work performed in terms of the National Environmental Management Act (Act No. 107 of 1998);
- Have and will not have vested interest in the proposed activity proceeding;
- Have no, and will not engage in, conflicting interests in the undertaking of the activity;
- Undertake to disclose, to the competent authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the National Environmental Management Act (Act No. 107 of 1998);
- As a registered member of the South African Council for Natural Scientific Professions, will undertake my profession in accordance with the Code of Conduct of the Council, as well as any other societies to which I am a member;
- Based on information provided to me by the project proponent and in addition to information obtained during the course of this study, have presented the results and conclusion within the associated document to the best of my professional ability; and
- Reserve the right to modify aspects pertaining to the present investigation should additional information become available through ongoing research and/or further work in this field.

Magnus van Rooyen (Pr.Sci.Nat) August 2024

SACNASP reg. no. 400335/11 Date

WETLAND AND AQUATIC ASSESSMENT ASSOCIATED PROPOSED BORROW PIT NEAR THE TOWN OF BETHAL, MPUMALANGA PROVINCE

1 INTRODUCTION

Ecolink Consulting has been appointed by GCS (Pty) Ltd to conduct a Wetland and Aquatic Assessment associated with the proposed operation of a borrow pit near the town of Bethal in the Mpumalanga Province. The material sourced from the borrow pit will be used in the construction of the Ummbila Emoyeni Wind Energy Facility (WEF) that is being developed in the surrounding area.

The assessment will be submitted in support of the Application for Environmental Authorisation in accordance with the National Environmental Management Act (Act No. 107 of 1998): Environmental Impact Assessment Regulations (2014), as amended and the Water Use Licence Application in accordance with the National Water Act (Act No. 36 of 1998).

2 PROJECT BACKGROUND

2.1 Project location and extent

The proposed borrow pit is located approximately 16km to the southeast of the town of Bethal along the R35 road between Bethal and Morgenzon (see Figure 2-1). To meet the requirements for a Mining Permit Application in accordance with the Mineral and Petroleum Resources Development Act (Act No. 28 of 2002), the extent of the borrow pit is limited to maximum area of 5ha. The corner point coordinates of the borrow pit is provided in Table 2-1 with the extent shown in Figure 2-2.

Table 2-1: Borrow pit corner point coordinates

Coordinate	Latitude	Longitude
A	26° 35' 40.97" S	29° 32' 09.55" E
B	26° 35' 44.70" S	29° 32' 10.83" E
C	26° 35' 47.72" S	29° 32' 04.48" E
D	26° 35' 46.04" S	29° 31' 59.73" E
E	26° 35' 42.99" S	29° 31' 59.09" E
F	26° 35' 41.38" S	29° 31' 59.73" E

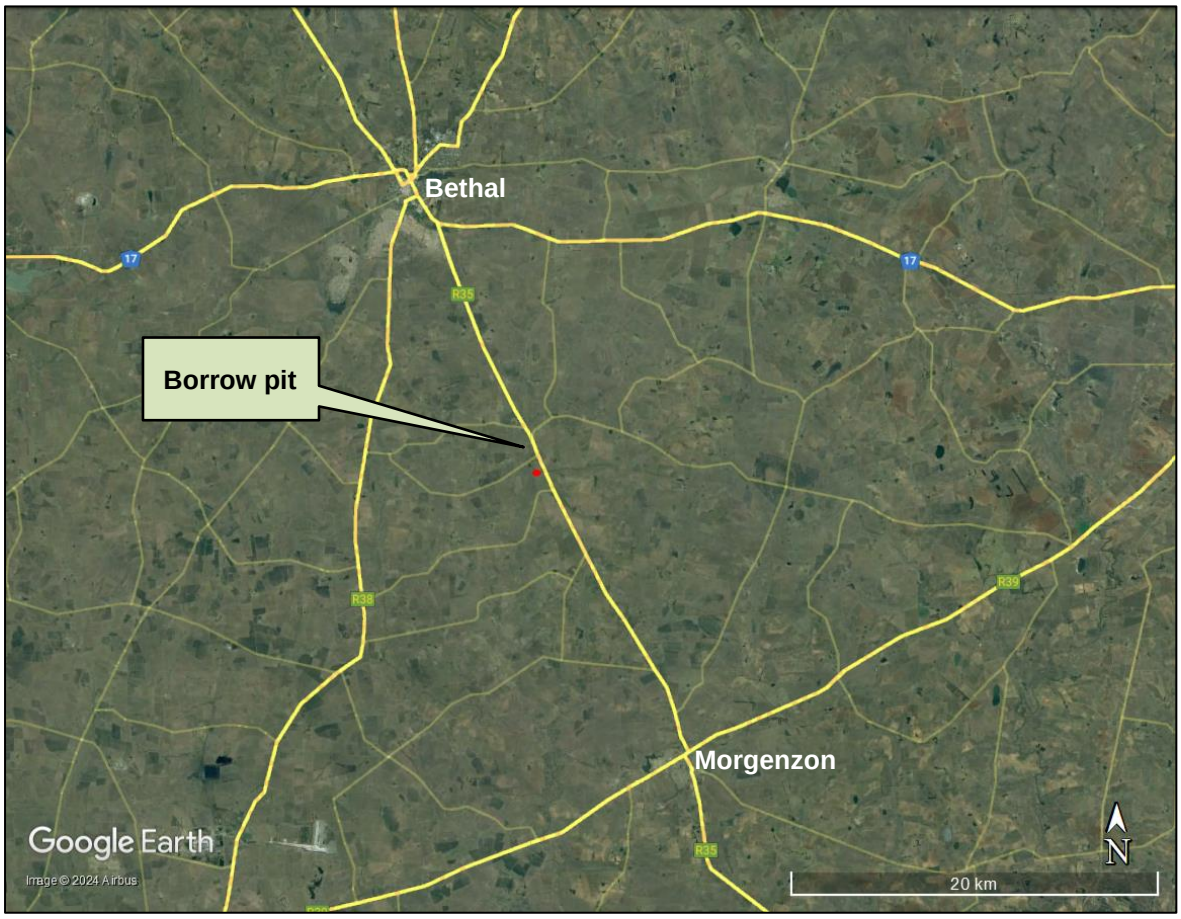


Figure 2-1: Location of the proposed borrow pit between the towns of Bethal and Morgenzon

Figure 2-2: Extent of the borrow pit

2.2 Project description

The proposed borrow pit is located on a ridge line on portion 9 of the Farm Sukkelaar No. 421 IS above and to the north of the Heilvleispruit that is a tributary of the Kwaggalaagtespruit. The borrow pit is located in an area that is typically used for agricultural purposes which include the growing of grains and the farming of livestock.

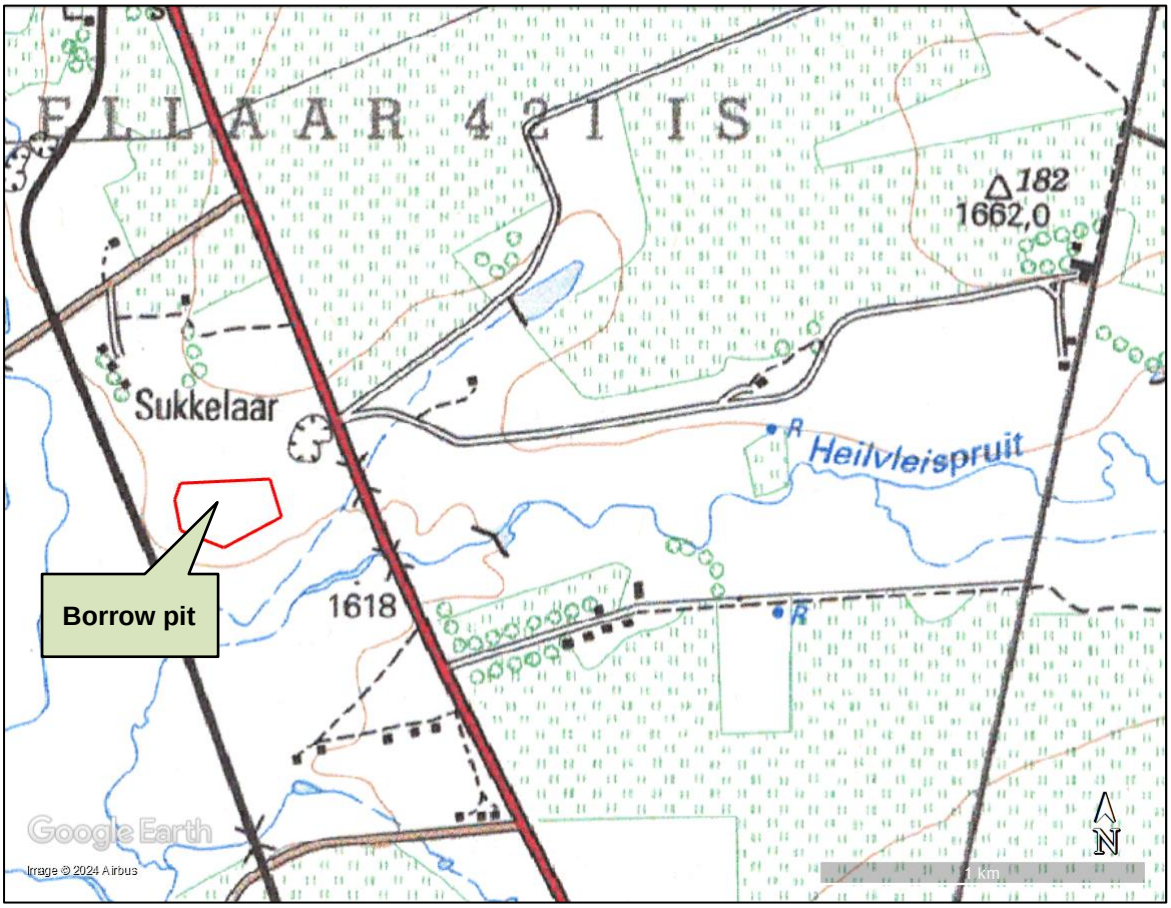


Figure 2-3: Location of the borrow pit area on the ridge line above the Heilvleispruit (extract from the 1 in 50 000 map sheet 2629DA)

The proposed borrow pit is located immediately to the west of an old borrow pit area that was opened *circa* 1968 (see Figure 2-4) and showing signs of use as recent as 2017 (see Figure 2-5). The material sourced from the borrow pit area was likely used for the upgrading of the provincial district roads in the area by the provincial roads' authority.

The material that will be sourced from the borrow pit consists of weathered dolerite and will be used solely for the construction of the roads associated with the Ummbila Emoyeni WEF that is located in the areas surrounding the borrow pit.

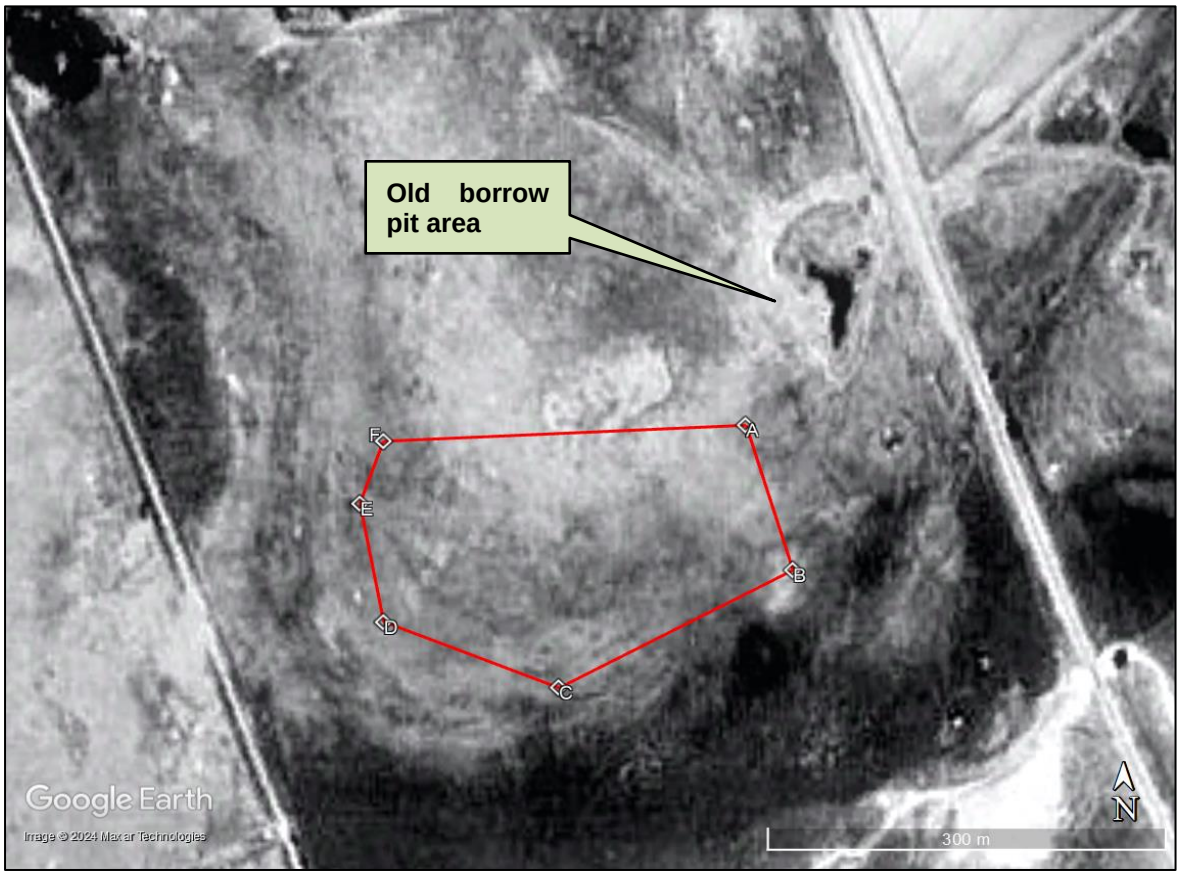


Figure 2-4: Dated aerial image (1968) of the existing borrow pit (supplied by the Surveyor General)

Figure 2-5: Aerial image (2017) in which the old borrow pit area shows signs of use

Plate 2-1: View of the existing old borrow pit area, looking in a southerly direction

3 APPLICABLE SOUTH AFRICAN LEGISLATION

The national and provincial legislation briefly described in this section relates directly with the legal aspects associated with the biodiversity associated with the project.

3.1 Applicable National Legislation

The project applicable environmental related National Legislation is provided in Table 3-1.

Table 3-1: Applicable National Legislation

Legislation	Description
Constitution of the Republic of South Africa (Act No. 108 of 1996)	According to the South African Constitution, South African citizens have the right to have the environment protected for the benefit of the present and future generations.
Conservation of Agricultural Resources Act (Act No. 43 of 1983)	This Act includes the use and protection of land, soil, wetlands and vegetation and the control of weeds and invader plants. In the regulations published in 1984 under the Act, which declared approximately 50 plant species as "weeds" or "invader plants". This list was further expanded on 30 March 2001 to now contain a comprehensive list of declared weed and invader plant species.
White Paper on Environmental Management Policy for South Africa (1998)	Through this Policy, the government of South Africa commits to give effect to the many rights in the Constitution that relate to the environment.
National Veld and Forest Fire Act (Act No. 101 of 1998)	The purpose of the Act is to prevent and combat veld fires in the country. The Act was amended by the National Forest and Fire Laws Amendment Act (Act No. 12 of 2001).
National Water Act (Act No. 36 of 1998)	This Act recognises that water is a scarce and unevenly distributed natural resource that should be equitably utilised in a sustainable manner. The Act ensures that water resources are protected, used, developed, conserved and controlled in ways that take into account a range of needs and obligations, including the need to "protect aquatic and associated ecosystems and their biological diversity". The Act further specifies the water uses that must be authorised and it details the authorisation procedures as well as the minimum requirements for evaluation and decision-making by the relevant authority.
National Forests Act (Act No. 84 of 1998)	An objective of the Act is to provide special measures for the protection of certain forest and tree species, and to promote the sustainable use of forests for environmental, economic, educational, recreational, cultural, health and spiritual purposes. In terms of Section 15(1) of the Act, forest trees or Protected Tree Species may not be cut, disturbed, damaged, destroyed and their products may not be possessed, collected, removed, transported, exported, donated, purchased or sold – except under license granted by the relevant authority. Government Notice 35648 of 2012 provides the latest List of Protected Tree Species within the borders of South Africa.
National Environmental Management Act (Act No. 107 of 1998)	The Act is an umbrella act covering broad principles of environmental management which makes provision for three main areas, namely Land Planning and Development, Natural and Cultural Resources Use and Conservation and Pollution Control and Waste Management. In accordance with the Act, sustainable development requires the consideration of all relevant factors, including: • That the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied;

Legislation	Description
	• That the use and exploitation of non-renewable natural resources are conducted in a responsible and equitable manner and takes into account the consequences of the depletion of the resource; and • That the development, use and exploitation of renewable resources and the ecosystems of which they are part of do not exceed the level beyond which their integrity is jeopardised. According to Section 2(r) of the Act, sensitive, vulnerable, highly dynamic or stressed ecosystems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.
National Environmental Management: Protected Areas Act (Act No. 57 of 2003)	The Act focuses on the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural land-and seascapes. The Act addresses inter alia: • The protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural land- and seascapes; • The establishment of a national register of all national, provincial and local protected areas; • The management of those areas in accordance with national standards; and • Inter-governmental co-operation and public consultation in matters concerning protected areas.
National Environmental Management: Biodiversity Act (Act No. 10 of 2004)	The main objective of the act is to provide for the management and conservation of South Africa's biodiversity and to ensure the sustainable use of indigenous biological resources. In addition to regulations on Threatened, Protected, Alien and Invasive Species in South Africa, the Act also identifies Terrestrial and Aquatic Priority Areas and Threatened Ecosystems for biodiversity conservation.

4 TERMS OF REFERENCE

It is understood that the assessment will be submitted as part of the Application for Environmental Authorisation in accordance with the National Environmental Management Act (Act No. 107 of 1998): Environmental Impact Assessment (EIA) Regulations (2014), as amended. As such, the assessment report is completed in accordance with the minimum requirements for specialist assessments as included in Appendix 6 of the EIA Regulations (2014) as well as the protocol requirements associated with Aquatic Assessments. In addition, the assessment will be submitted in support of a Water Use Licence Application in accordance with the National Water Act (Act No. 36 of 1998).

As such, the assessment will be completed in accordance with the requirements of the abovementioned Acts and will focus on the potential impacts that the project may have on the identified aquatic features within the study site. The assessment will make provision for the following regulated requirements:

- Location of the activity within the "regulated area of a watercourse" as defined by the Act;

- An identification of all the aquatic features within the determined “regulated area of a watercourse”;
- A delineation of all these identified aquatic features to determine their extent, the delineation will be conducted in accordance with the Department of Water Affairs and Sanitation’s guideline on the delineation of these features;
- An assessment of the identified aquatic features to determine their hydrogeomorphic classification, their present ecological state (PES), the ecosystem services they provide as well as their ecological importance and sensitivity (EIS);
- Identification of the potential impacts of the proposed activity on the identified aquatic features;
- An impact assessment with the provision of management and mitigation measures; and
- A Risk Assessment Matrix that follows the Department of Water and Sanitation protocols.

In brief, these requirements have as an outcome to achieve the following:

- A methodology of the site visit and techniques used to assess the specific aspects of the site;
- Details of the assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of site plan identifying site alternatives (where applicable);
- An indication of any areas that are to be avoided, including provision of buffers;
- A description of any assumptions made and any uncertainties or gaps in knowledge;
- A description of the findings and potential implications of such findings on the impact of the proposed activities;
- Any mitigation measures for inclusion in the Environmental Management Programme Report (EMPr);
- Any conditions for inclusion in the Environmental Authorisation and the Water Use Licence;
- Any monitoring requirements for inclusion into the EMPr or Water Use Licence; and
- A reasoned opinion whether the activity should be authorised based on the findings of the assessment.

5 ASSUMPTIONS AND KNOWLEDGE GAPS

The following are assumptions made in the completion of the report:

- The assessment of the potential impacts of the proposed development on the aquatic features on the development site is based on the development layout that has been provided. If the development layout is amended, the impact identification and assessment contained in this report may also change.
- The findings of the report are limited to a single day long site visit conducted on 10 April 2024 which is considered to be autumn to early winter. No provision has been made for seasonal visits to the site and is not considered a shortcoming of the report.
- The identification and delineation of the aquatic features that have been assessed within the study area was conducted in terms of the procedures as specified by the Department of Water and Sanitation.
- The classification of any identified aquatic features has been conducted in accordance with the classification system of inland aquatic ecosystem as prescribed by Ollis *et al.,* 2013.
- The following desktop information was used to augment the finding of the assessment:
    - Electronic biodiversity databases managed by the South African National Biodiversity Institute (SANBI);
    - Available provincial electronic biodiversity databases;
    - Wetland and Riparian Habitat Delineation Document (Department of Water and Sanitation report); and
    - Classification system for wetlands and other aquatic ecosystems in South Africa (Inland Systems) (Ollis *et al.*, 2013 – SANBI Biodiversity Series 22).

6 REPORTING CONDITIONS

The following conditions apply to the report in part or as a whole:

- The findings and conclusion of this report are based on the author's scientific and professional knowledge as well as available information at the time of the assessment. In addition, the recommendations made are considered to be the best, implementable actions that can be taken to alleviate the identified impacts.

- As such, the author accepts no liability for any actions, claims, demands, losses, liabilities, costs, damages, and expenses that may arise from or in connection with the services rendered, and by any use of the information contained in this document.
- No part of this report may be amended without written consent from the author.

7 EXPERTISE OF THE SPECIALIST

Mr Magnus van Rooyen is a registered natural scientist with the South African Council of Natural Scientific Professions (SACNASP) and holds a Master's degree in Environmental Management, a BSc Honours degree in Botany and a BSc degree in Botany and Zoology from the University of Stellenbosch. Mr van Rooyen has in excess of 25 years' experience in the field of wetland and terrestrial ecological studies in Southern and Western Africa. The *curriculum vitae* of the specialist, Mr Magnus van Rooyen is attached in Appendix A.

8 METHODOLOGY

The methodology that was followed in completing this study is in line with the requirements and specifications of the Department of Water and Sanitation. In addition, provision was made to conduct an assessment to meet the extended aspects included in the Scope of Works.

8.1 Identification of aquatic features and mapping

The initial identification process for aquatic features was conducted at a desktop level during which available GIS databases were interrogated to determine the presence of any wetland and watercourse areas that have been determined in the past. The key database that was interrogated was the National Freshwater Ecosystem Priority Area (NFEPA) as managed and updated by the South African National Biodiversity Institute (SANBI) as well as the updated version of this dataset, the Wetland MAP5 (2018).

In addition to the database interrogation, the most recent Google Earth and Zoom Earth Imagery of the site was considered to see if any wetland areas or "anomalies" within the site are visible.

Following the desktop assessment of the site, a site visit was conducted on 10 April 2024. During the site visit, the potential aquatic features identified through the desktop assessment were verified and any other aquatic features were identified and their boundaries accurately delineated.

8.2 Aquatic feature delineation

The delineation of these wetlands areas was conducted in accordance with the Department of Water and Sanitation, *"A practical field procedure for identification and delineation of wetlands and riparian areas"* (2005).

This field guide makes use of several specific indicators which show the presence and the boundaries of wetlands. The presence of the following indicators was used during the identification and delineation of the site:

- ***Terrain Unit Indicator*** – Identification of the part of the landscape where wetlands are more likely to occur;
- ***Soil Form Indicator*** – Identification of the soil types which are associated with prolonged and frequent saturation;
- ***Soil Wetness Indicator*** – Identification of the morphological signatures that develop in soil profiles as a result of prolonged and frequent saturation; and
- ***Vegetation Indicator*** – Identification of the hydrophilic vegetation associated with frequently saturated soil.

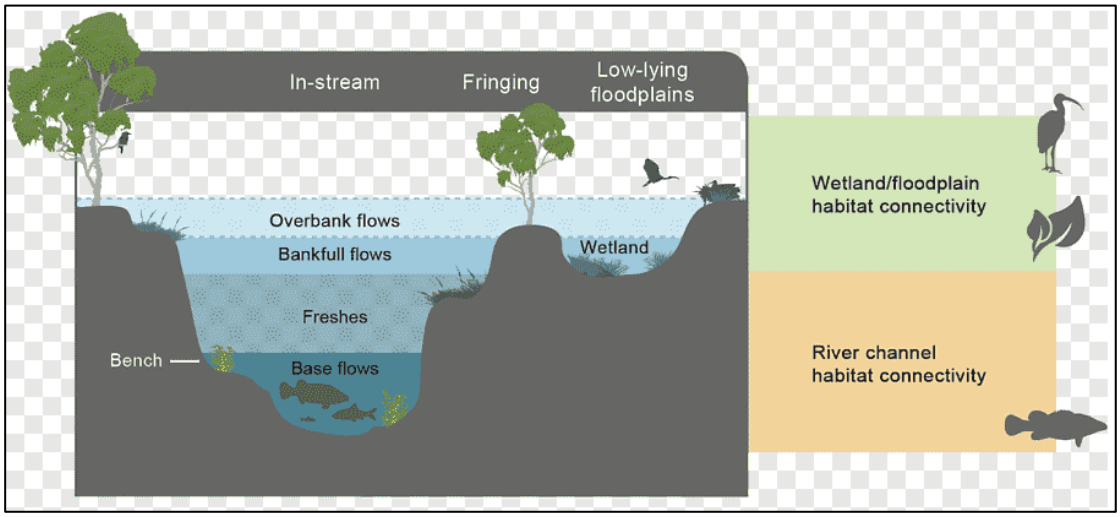
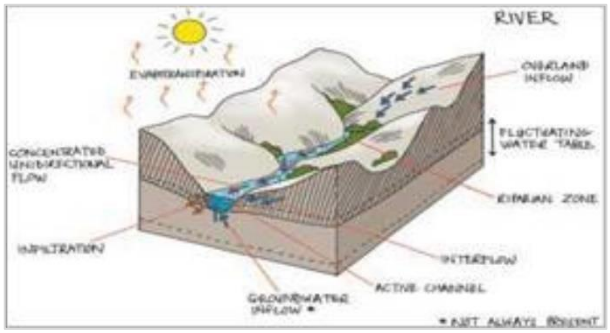
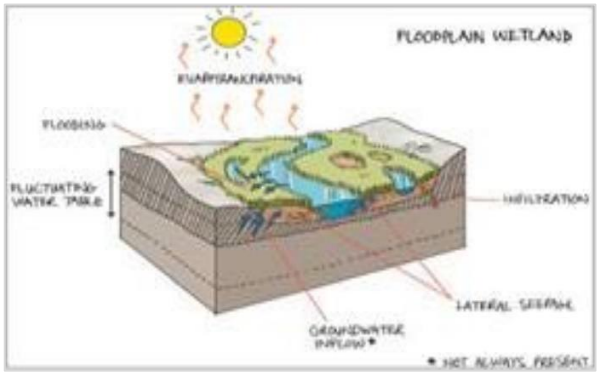
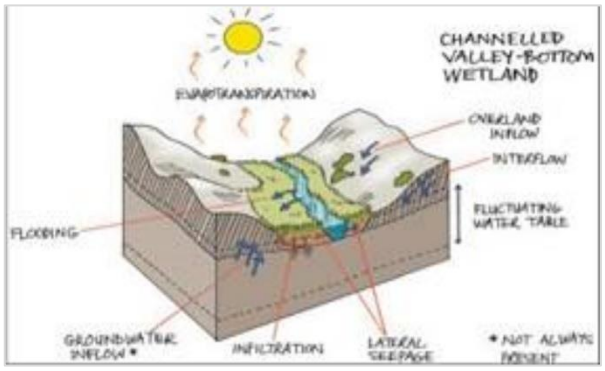
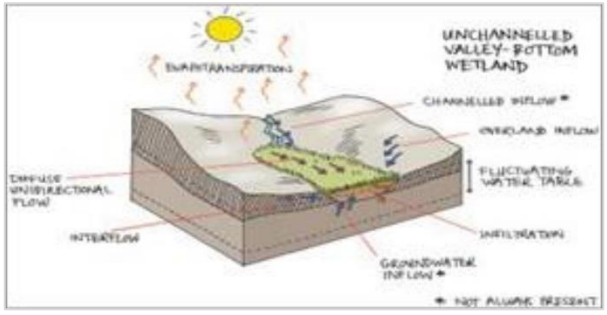
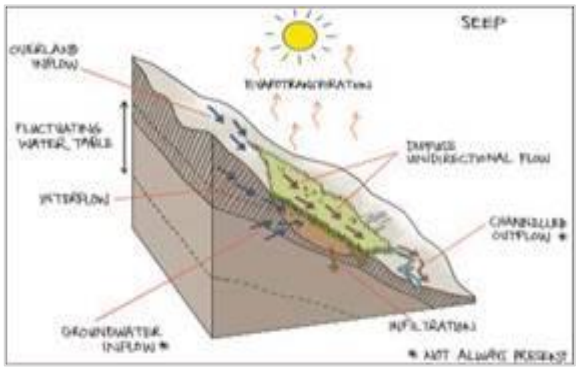
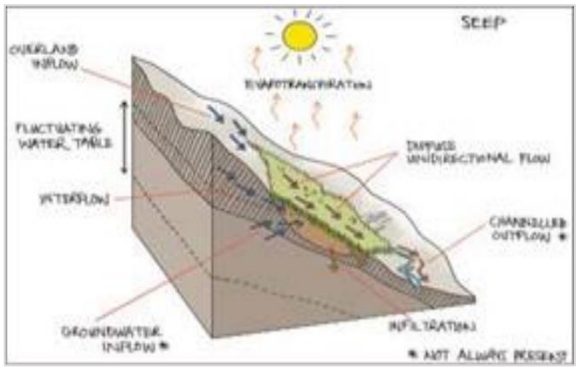
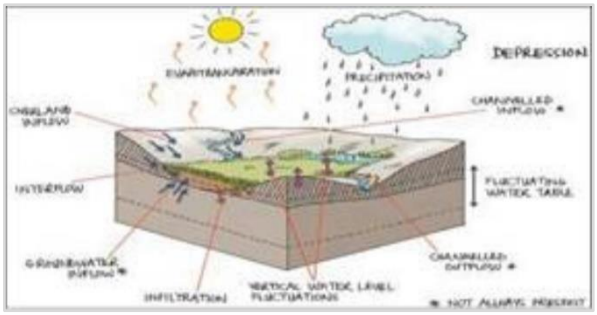
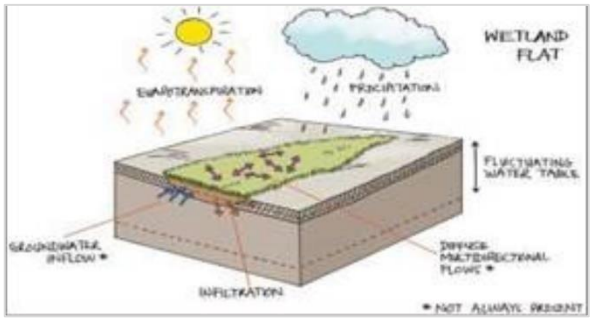


Figure 8-1: Cross section through a typical drainage basin (www.pngegg.com)

Following the identification of the aquatic features on the study site, these are then classified into specific hydrogeomorphic (HGM) units according to the Classification System for Wetlands and other Aquatic Ecosystems in South Africa (inland systems) (Ollis *et al*., 2013).

Table 8-1: Wetland hydrogeomorphic (HGM) types typically supporting inland wetlands in South Africa (Ollis *et al.*, 2013)

Hydrogeomorphic types		Description
River		Rivers are linear landforms with clearly discernible banks and a channel, which permanently or periodically, carries a contained and defined flow of water. A river is taken to include both the active channel and the riparian zone.
Floodplain		Valley bottom areas with a well-defined stream channel, gently sloped and characterised by floodplain features such as oxbow depressions and natural levees and the alluvial (by water) transport and deposition of sediment, usually leading to a net accumulation of sediment. Water inputs from main channel (when channel banks overspill) and from adjacent slopes.
Valley bottom with channel		Valley bottom areas with a well-defined stream channel but lacking characteristic floodplain features. May be gently sloped and characterised by the net accumulation of alluvial deposits or may have steeper slopes and be characterised by the net loss of sediment. Water inputs from main channel (when channel banks overspill) and from adjacent slopes.
Valley bottom without a channel		Valley bottom areas with no clearly defined stream channel, usually gently sloped and characterised by alluvial sediment deposition generally leading to a net accumulation of sediment. Water inputs mainly from channel entering the wetland and also from adjacent slopes.

Hydrogeomorphic types		Description
Hillslope seepage linked to a stream channel		Slopes on hillsides, which are characterised by the colluvial (transported by gravity) movement of materials. Water inputs are mainly sub-surface flow and outflow is usually via a well-defined stream channel connecting the area directly to a stream channel.
Isolated Hillslope seepage		Similar to other hillslope seeps but with no direct surface water connection to a stream channel. Slopes on hillsides, which are characterised by the colluvial (transported by gravity) movement of materials. Water inputs mainly from sub-surface flow and outflow primarily by diffuse sub-surface and/or limited surface flow.
Depression (includes Pans)		A basin shaped area with a closed elevation contour that allows for the accumulation of surface water (i.e. it is inward draining). It may also receive sub-surface water. An outlet is usually absent, and therefore this type is usually isolated from the stream channel network.
Wetland Flat		A flat wetland with no apparent inlet or outlet points. Water is obtained from surface or near surface flows and is lost either by downward percolation or evapotranspiration. May be only seasonal in terms of its wetness and hydromorphic soils may be only weakly developed or else be absent. Vegetation may be the strongest indicator.

8.3 Riparian Delineation

The delineation of the riparian areas was conducted in accordance with the Department of Water and Sanitation document, “A practical field procedure for identification and delineation of wetlands and riparian areas” (2005).

Like wetlands, riparian areas have their own unique set of indicators. It is possible to delineate riparian areas by checking for the presence of these indicators. The riparian delineation process takes the following physical aspects into consideration:

- ***Topography associated with the watercourse*** – The topography is a good rough indicator of the outer edge of the riparian area as the riparian edge is the same as the edge of the macro channel bank.
- ***Vegetation*** – The delineation of riparian areas relies primarily on the vegetative indicators. Using vegetation, the outer boundary of a riparian area must be adjacent to a watercourse and can be defined as the zone where a distinctive change occurs:
    - In species composition relative to the adjacent terrestrial area; and
    - In the physical structure, such as vigour or robustness of growth forms of species similar to that of adjacent terrestrial areas. Growth form refers to the health, compactness, crowding, size, structure and/or numbers of individual plants.
- ***Alluvial soils and deposited material*** – Alluvial soils can be defined as relatively recent deposits of sand, mud, etc. set down by flowing water, especially in the valleys of large rivers. Riparian areas often, but not always, have alluvial soils.

8.4 Aquatic features functional Assessment

Once the aquatic features have been identified and their boundaries determined, the assessment of the ecosystem services these features provide to the hydraulic system that they contribute to, as well as the immediate natural and social environment, was undertaken. An understanding of this functionality of these features contributes directly to the level of importance that is attributed to the specific feature that is developed. The assessment was conducted by using a modelling tool that forms part of the WET-Management Series (issued by the Water Research Commission), WET-EcoServices (Kotze *et al*., 2008).

The WET-EcoServices tool makes provision for the rapid assessment of the ecosystem services provided by an aquatic feature. The process of applying the tool is based on the characterisation of hydrogeomorphic aquatic feature types based on desktop and field assessment and observations of identified and delineated aquatic features. This model, furthermore, considers the biophysical and social conditions around a feature and converts these considerations into a fixed score for a series of defined ecosystem services that the wetland delivers.

- Flood Attenuation
- Streamflow regulation

- Sediment trapping
- Nitrate Assimilation
- Erosion control
- Maintenance of biodiversity
- Provision of harvestable resources
- Cultural significance
- Education and research
- Phosphate assimilation
- Toxicant Assimilation
- Carbon storage (sequestration)
- Provision of water for human use
- Provision of cultivated food
- Tourism and recreation

The maximum score for any service is a value of 4 and the rating of the probable extent of the service is shown in the table below.

Table 8-2: Ecoservices rating of the probable 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

8.5 Determining the Present Ecological State of a water resource

The determination of the present ecological state (PES) of a water resource was conducted by using a tool from the WET-Management Series (issued by the Water Research Commission), the WET-Health (Macfarlane *et al.*, 2008).

This tool is designed to assess the health or integrity of an aquatic feature. The health of the aquatic feature is defined as a measure of the deviation of feature in structure and function from the it's natural reference condition. The tool therefore attempts to assess the hydrological, geomorphological and vegetation impacts that has been imparted on the wetland at the time of assessment.

The overall approach is to quantify the impacts of human activity or clearly visible impacts on the health of the aquatic feature, 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 impact scores and Present State categories are provided in the tables below.

Table 8-3: The magnitude of impacts on wetland functionality (Macfarlane *et al.*, 2008)

Impact Category	Description	Score
None	No Discernible modification or the modification is such that it has no impacts on the wetland integrity	0 to 0.9
Small	Although identifiable, the impact of this modification on the wetland integrity is small.	1.0 to 1.9
Moderate	The impact of this modification on the wetland integrity is clearly identifiable, but limited.	2.0 to 3.9
Large	The modification has a clearly detrimental impact on the wetland integrity. Approximately 50% of wetland integrity has been lost.	4.0 to 5.9
Serious	The modification has a highly detrimental effect on the wetland integrity. More than 50% of the wetland integrity has been lost.	6.0 to 7.9
Critical	The modification is so great that the ecosystem process of the wetland integrity is almost totally destroyed, and 80% or more of the integrity has been lost.	8.0 to 10

The level of impacts on these three parameters is a direct indication of the PES of the aquatic feature as well as its functionality. An aquatic feature that has undergone severe impacts on its hydrology, geomorphology or vegetation or a combination of all three will reflect a low present ecological state while the converse is also true for pristine features. Since hydrology, geomorphology and vegetation are interlinked in the model, their scores are aggregated to obtain the overall PES health score using the formula:

Health = ((Hydrology value x 3) + (Geomorphology value x 2) + (Vegetation value x 2))/7

Table 8-4: Definitions of the PES categories (Macfarlane *et al.*, 2008)

Impact Category	Description	Impact Score Range	Present State Category
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

8.6 Determining the Ecological Importance and Sensitivity of aquatic features

The outcomes of the implementation of the WET-EcoServices tool discussed above, is key in the determination of the ecological importance and sensitivity of aquatic features as the results is a direct indication of the contribution that the feature is making to the hydraulic system with which it is linked. This contribution is linked to the sensitivity of this feature to any possible change and how this will impact on the hydraulic system it is linked to.

8.7 Ecological Classification and Description

The ecological classification and description are direct results of the implementation of the methodology and tools described above as the results of these determinations contribute to the understanding of the ecology of the aquatic feature. The description of the aquatic feature will therefore make provision for a description of the physical attributes of the feature (location, size, etc.), the ecosystem services that it provides, the current ecological state of the feature and the importance of the feature and its sensitivity.

9 DESCRIPTION OF THE STUDY SITE

9.1 Climate

The climatic conditions for the study site are characterised by a humid subtropical climate with hot, humid summers and dry cold winters with frost regularly occurring in the valley bottoms and other low-lying areas. The mean summer temperature for the district is approximately 23ºC with the mean winter temperature being 10ºC. Annual rainfall is estimated at approximately 800mm of rain that primarily falls during the summer months with drizzle characterising the rainfall during autumn and spring. A summary of the climatic conditions for the general area is provided in the figure below.

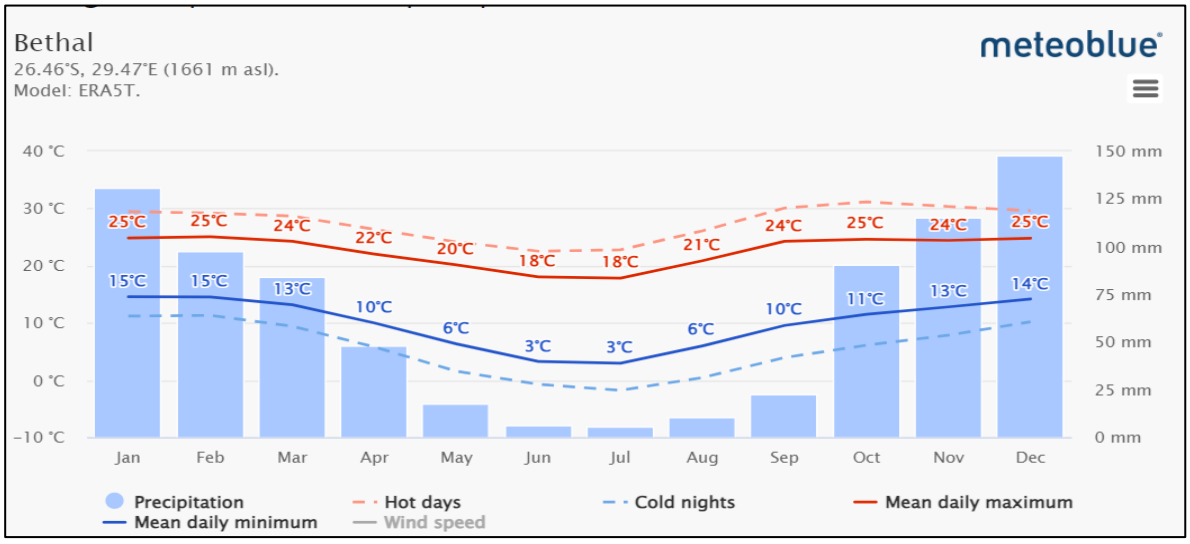


Figure 9-1: Average climatic conditions of the town of Bethal (source www.meteoblue.com)

9.2 Vegetation

The project site is located in the Soweto Highveld Grassland (Gm8) that extends between Ermelo and Johannesburg in the north, Perdekop in the southeast and the Vaal River in the south and westwards as far as Randfontein (see Figure 9-2).

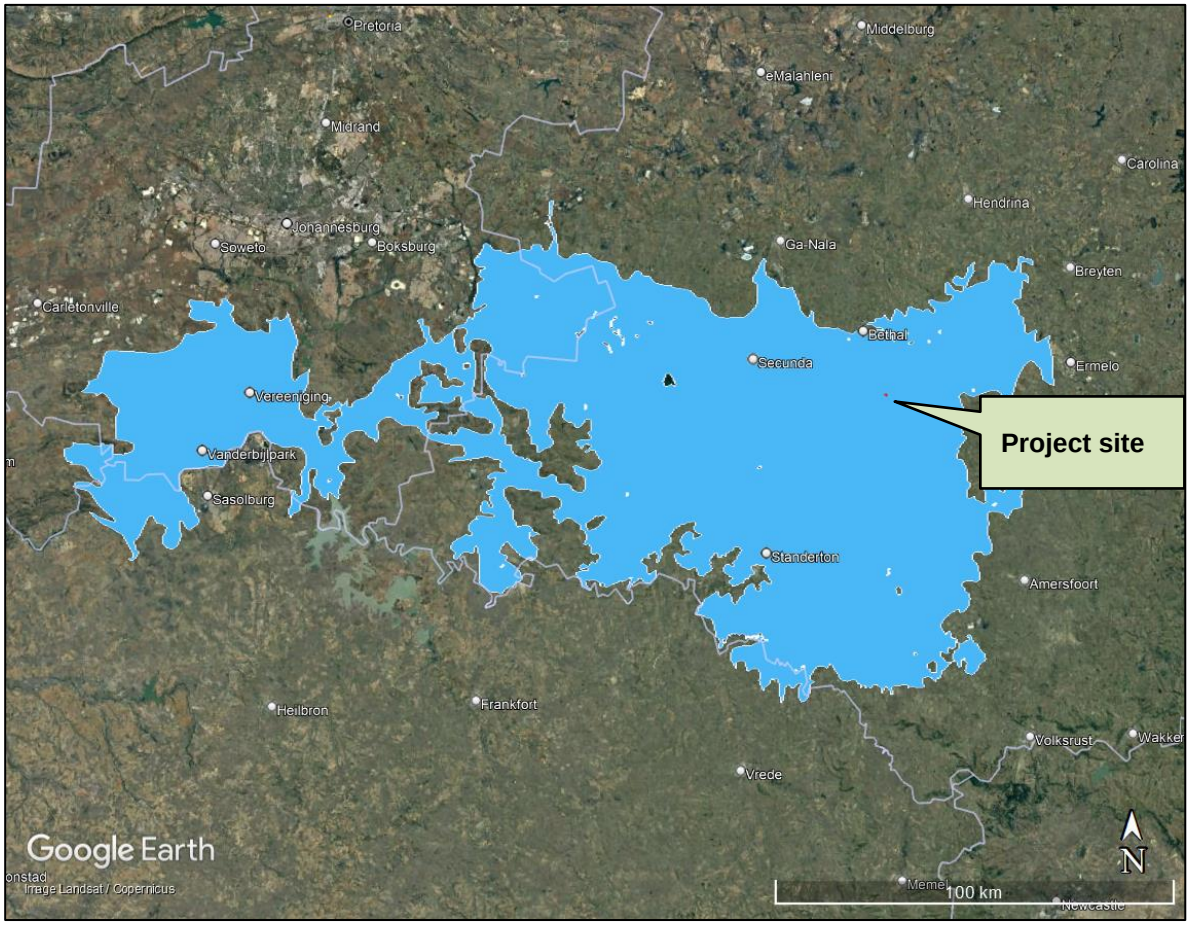


Figure 9-2: Extent of the Soweto Highveld Grassland (Gm8)

The vegetation typically consists of short to medium-high, dense, tufted grassland dominated by *Themeda triandra* (Red Grass) in its pristine state. Other grasses that occur in the vegetation type consists of common *Elionurus muticus* (Wire Grass), *Eragrostis racemosa* (Narrow Heart Love Grass), *Heterpogon contortus* (Spear Grass) and *Tristachya leucothrix* (Hairy Trident Grass).

The vegetation type has an “endangered” classification due to the relatively small percentage (approximately 24%) of the vegetation type that is statutorily conserved. The impacts on the vegetation type are directly linked to cultivation, urban sprawl, mining and building of road infrastructure.

The vegetation on the project site show signs of transformation due to livestock grazing activities and possibly activities associated with the working of the old borrow pit immediately next to the project site. The dominant grass species consists of *Elionurus muticus* (Wire Grass) and *Tristachya leucothrix* (Hairy Trident Grass).

Plate 9-1: View of the vegetation on the project site, looking in a southerly direction

9.3 Topography

The project site is located on a low, east to west ridge line that forms the northern edge of the Heilvleispruit valley. The site is flat and drains in a southerly direction. No significant topographical features occur on the site.

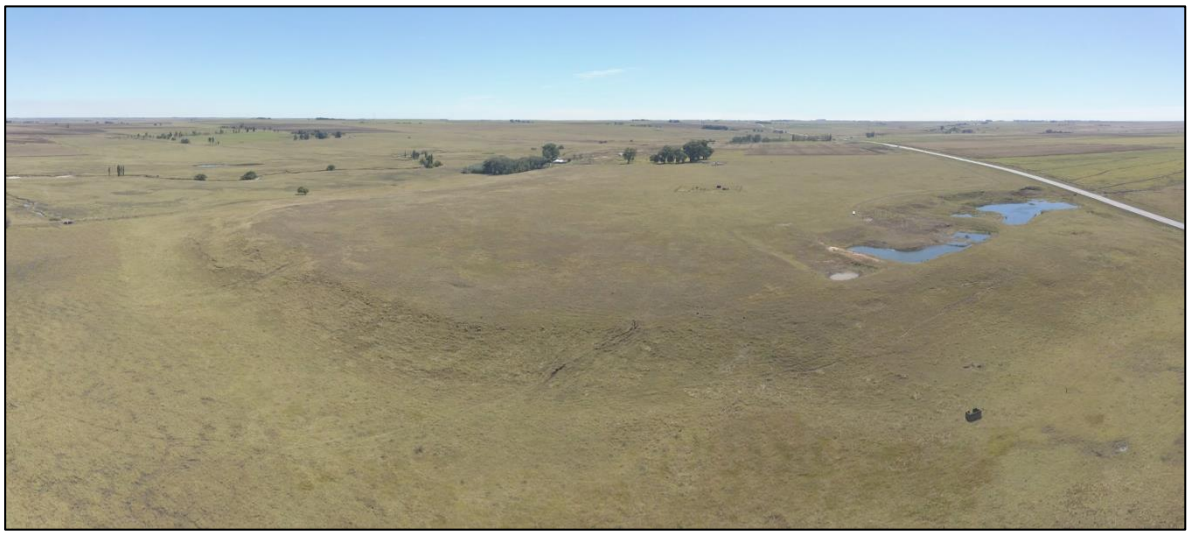


Plate 9-2: Aerial view of the project site showing the topography, looking in a northerly direction

9.4 Land cover and land use

The land use surrounding the project site largely consists of agricultural activities made up of veldt grazing of livestock and cultivation of maize, soyabeans and other crops in rotation. These practices have been present in the surrounding areas for decades. The land use on the project site consists of open veldt grazing. The area has not been ploughed and planted likely due to the presence of the weathered dolerite at surface that covers the majority of the site.

Plate 9-3: View of the weathered dolerite at or near the surface in the project site

Figure 9-3: Dated aerial image (1979) of the project site showing the cultivated areas surrounding the site

10 DESKTOP ASSESSMENT FINDINGS

The findings relating to the terrestrial ecology is based on the desktop assessment of available databases as well as site investigations.

10.1 Department of Forestry, Fisheries and Environment (DFFE) Online Screening Tool

The results generated by the DFFE Online Screening Tool has classified the Aquatic Theme sensitivity to be “LOW” due to the absence of any aquatic features within the project boundaries.

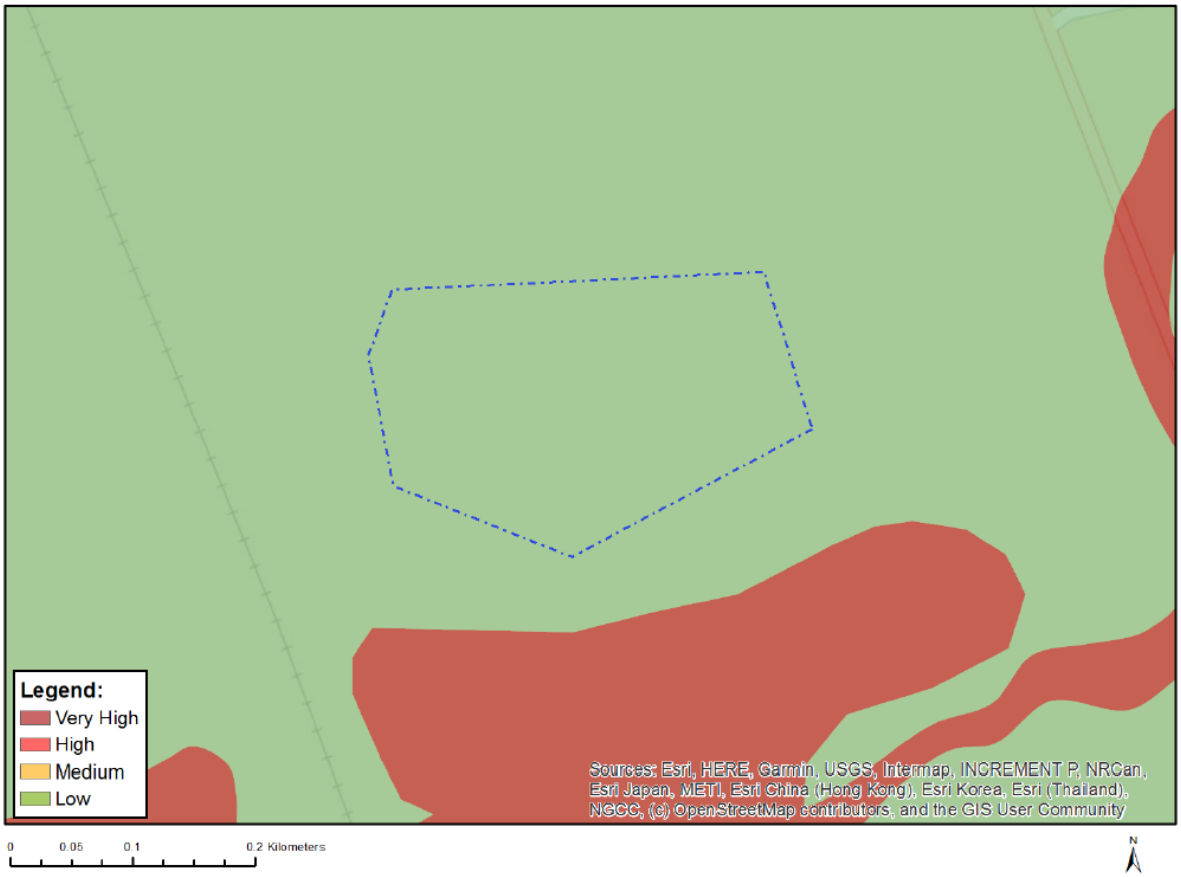


Figure 10-1: Location of the project site in a LOW sensitivity area as per the DFFE Online Screening Tool

10.2 Hydrological setting

The results of the desktop assessment of the hydrological characteristics of the study site are provided in the table below.

Table 10-1: Desktop hydrological characteristics of the study site

Hydrological characteristic	Result	Comment
Water Management Area	Vaal	
Primary Catchment	Primary region C	

Hydrological characteristic	Result	Comment
Tertiary Catchment	C11	
Quaternary Catchment	C11H	The dominant river in the Quaternary Catchment is the Blesbokspruit that drains the catchment in a southerly direction, two unnamed tributaries and the Kwaggalaagte River are identified as NFEPA Rivers in the catchment (see Figure 10-2). All these rivers are considered to be non-perennial rivers. All these NFEPA Rivers are classified as Class C rivers which means that they are considered to be Moderately Modified.

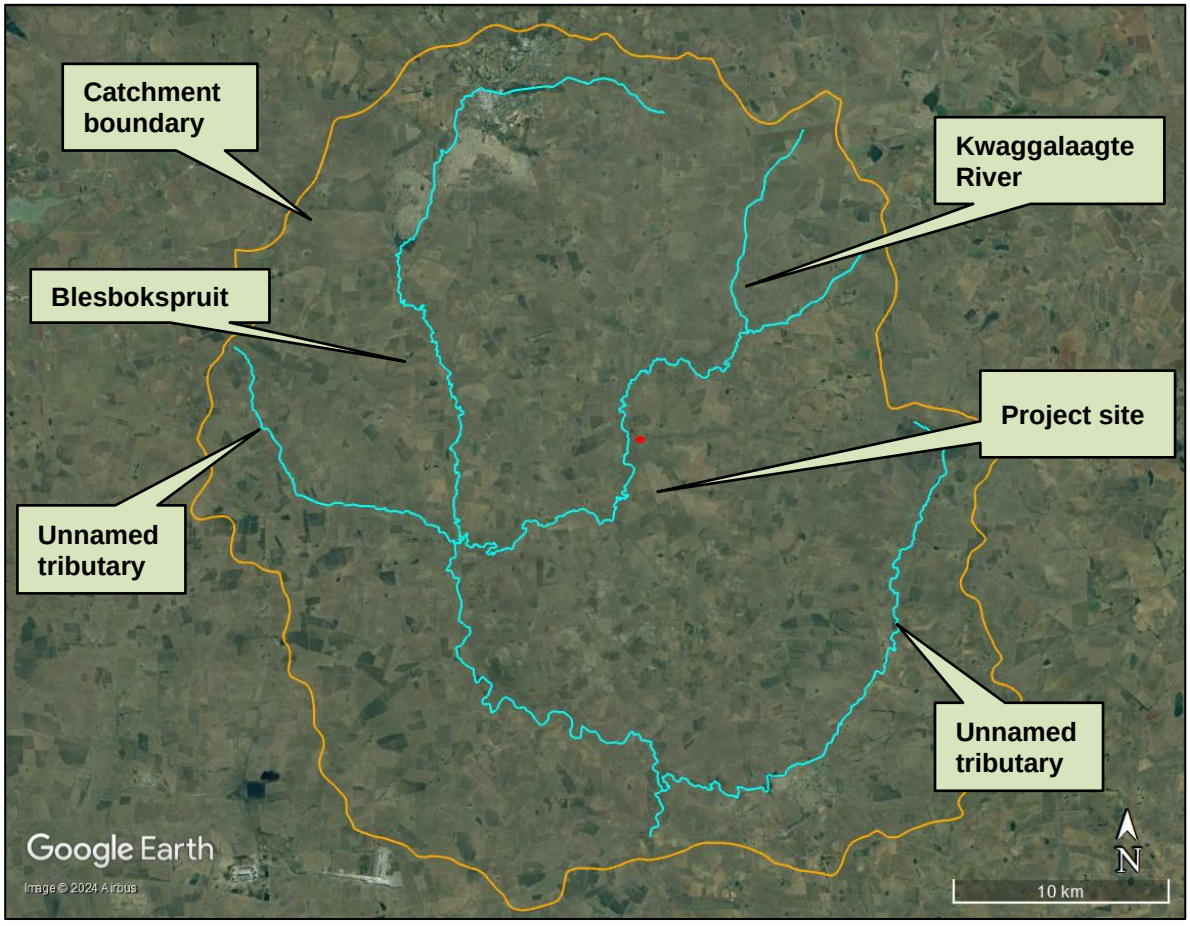


Figure 10-2: Location of the NFEPA Rivers identified in the NFEPA Database for Quaternary Catchment C11H

No NFEPA Rivers were identified to be within the boundaries of the project site.

10.3 National Freshwater Ecosystem Priority Areas (NFEPA)(2014):

The National Freshwater Ecosystem Priority Areas (NFEPA) project provides strategic spatial priorities for conserving South Africa's freshwater ecosystems and supports sustainable use of water resources. The priority areas are called Freshwater Ecosystem Priority Areas, or "FEPAs". The FEPAs were identified based on:

- Representation of ecosystem types and flagship free-flowing rivers;
- Maintenance of water supply areas in areas with high water yield;
- Identification of connected ecosystems;
- Representation of threatened and near-threatened fish species associated with migration corridors;
- Preferential identification of FEPAs that overlapped with:
    - Any free-flowing river;
    - Priority estuaries identified in the National Biodiversity Assessment (2011); and
    - Existing protected area and focus area for protected area expansion identified in the National Protected Area Expansion Strategy.

Based on the above criteria, the database has identified the absence of any wetland features within a 500m radius of the project site. The location of the nearest NFEPA wetland features to the project site is shown in Figure 10-3. Please note that no features are within the boundaries of the project site or within a 500m radius of the project site.

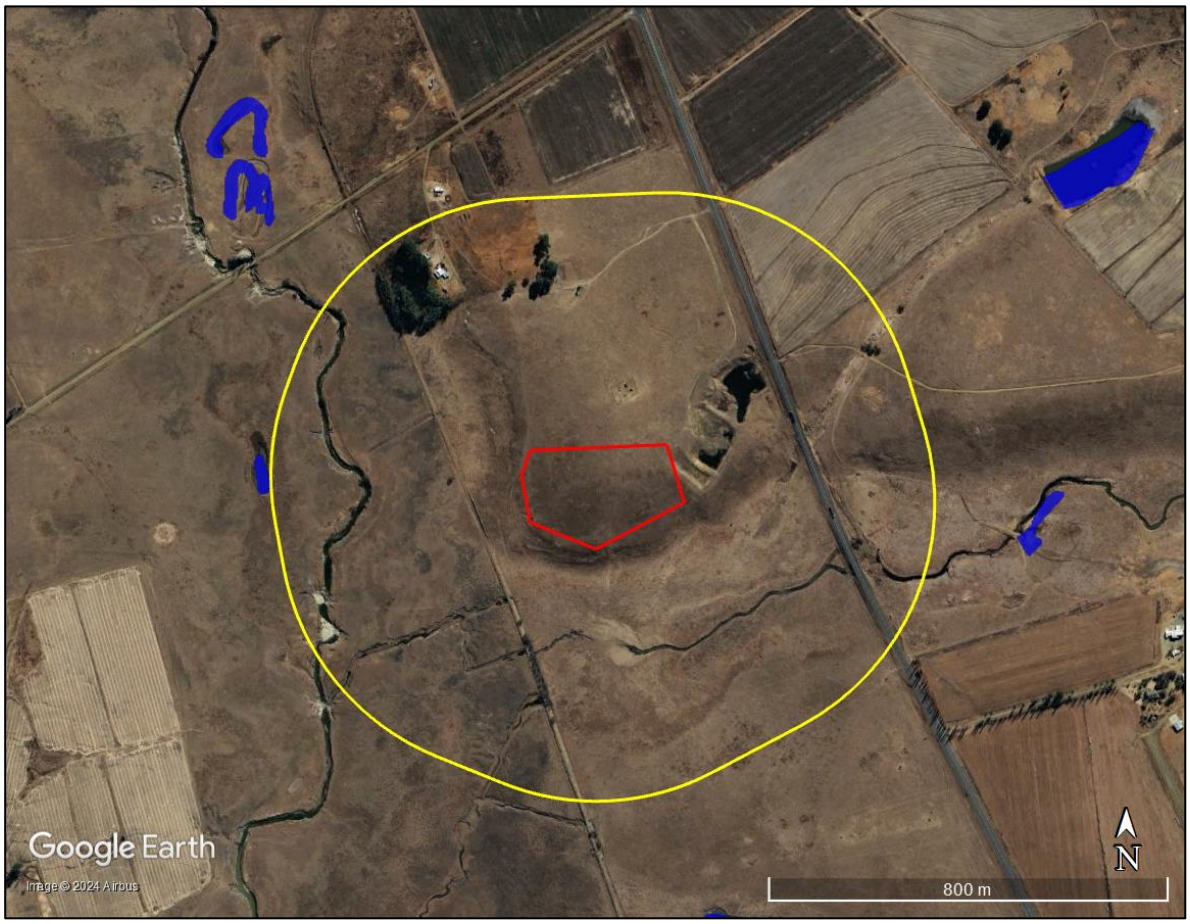


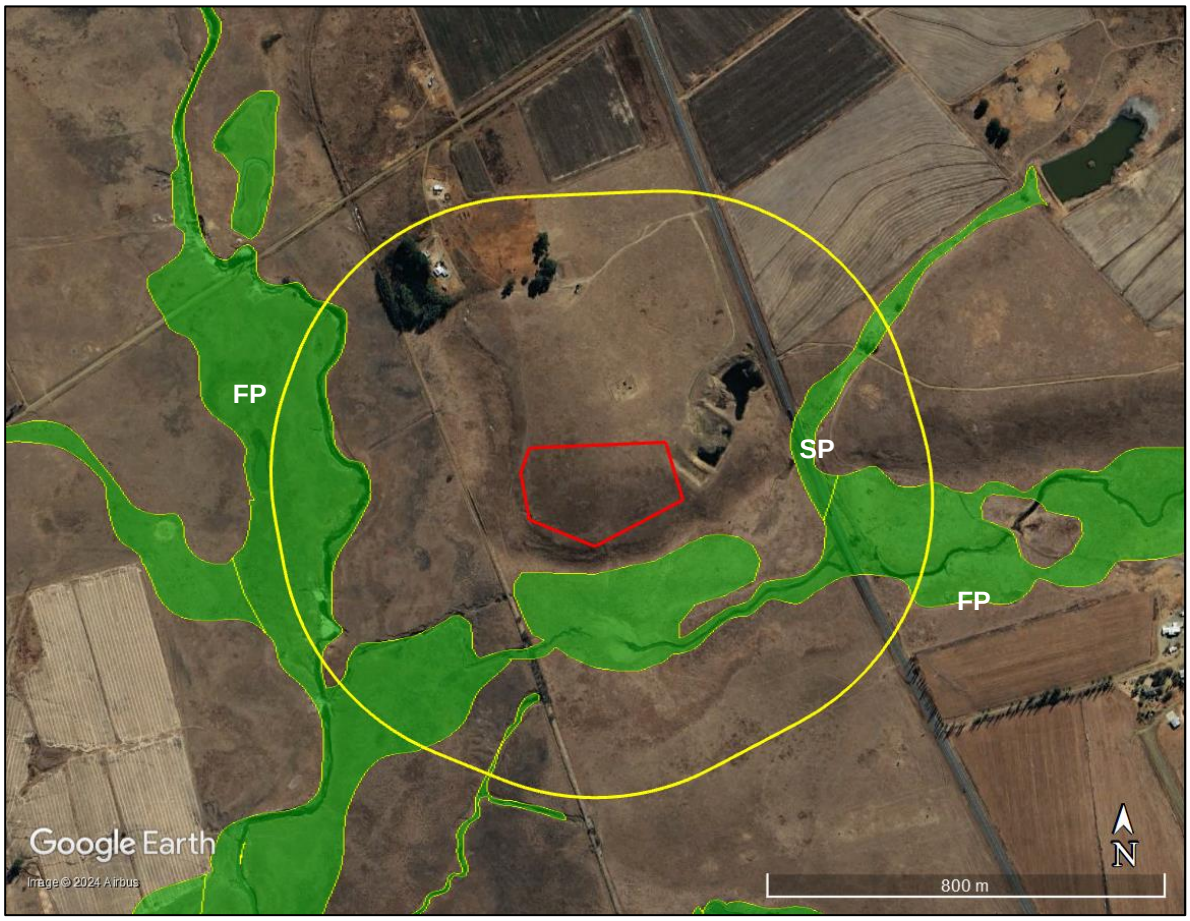
Figure 10-3: Location of the wetland features identified in the NFEPA Dataset (shown in blue) in relation to a 500m radius (shown in yellow) of the project site (shown in red)

10.4 South African Inventory of Inland Aquatic Ecosystems (SAIIAE) (2018)

A South African Inventory of Inland Aquatic Ecosystems (SAIIAE) was established during the National Biodiversity Assessment of 2018 (NBA 2018). The SAIIAE offers a collection of data layers pertaining to ecosystem types and pressures for both rivers and inland wetlands.

The SAIIAE builds on previous efforts while also introducing improvements and several new elements. An inventory of inland aquatic ecosystems responds to a multi-stakeholder need for the planning, conservation and management of these systems, as mandated by a number of Legislative Acts, including the South African National Water Act (NWA) and the National Environmental Management: Biodiversity Act (NEMBA), 2004 (Act 10 of 2004), as amended.

The dataset has indicated the presence of two Flood Plain wetlands one associated with the Heilvleispruit and the other with the Kwaggalaagte River within a 500m radius of the project site. In addition, a small Seep wetland is located to the east of the project site. The location of these features in relation to the project site is shown in Figure 10-4. It is important to note that no wetland features have been identified within the boundaries of the project site.

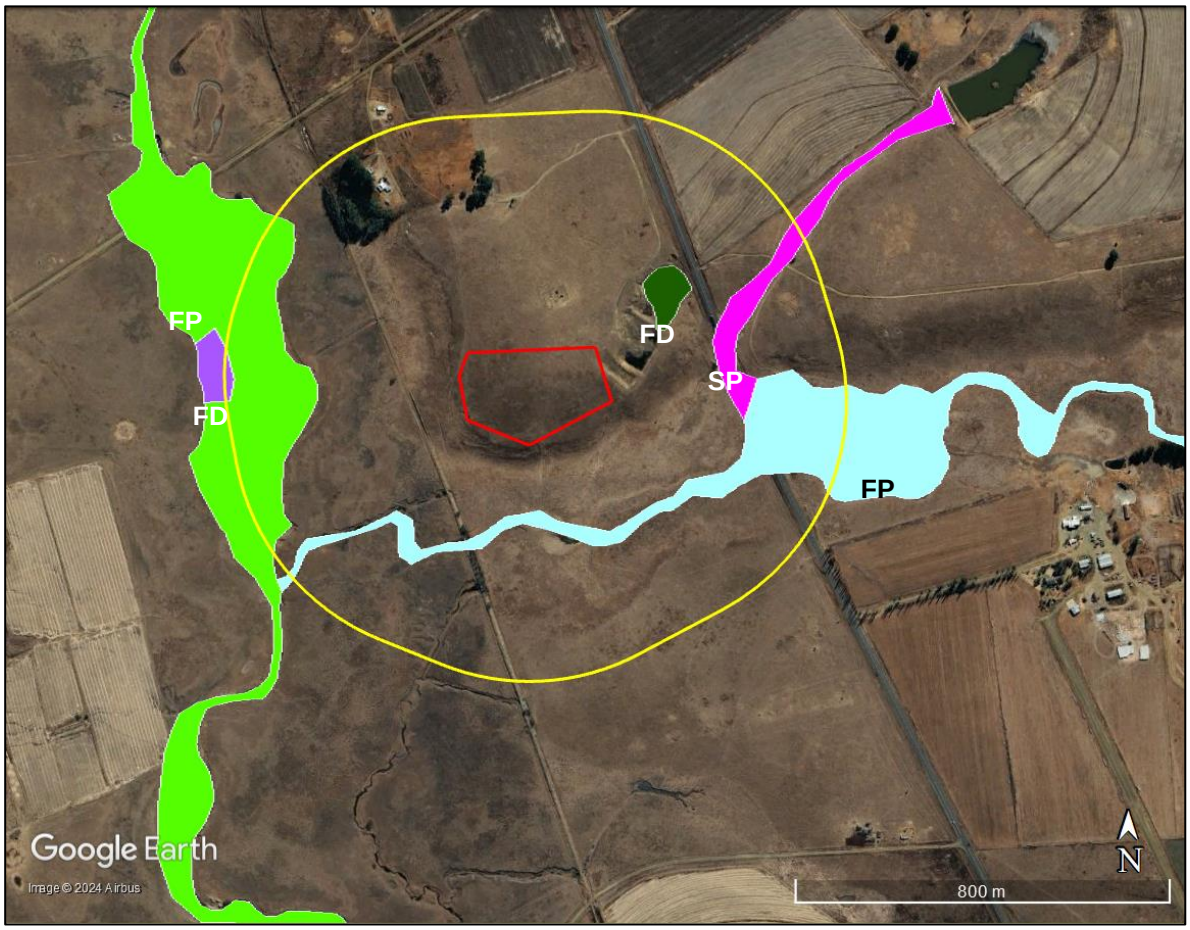


FP = Flood Plain; SP = Seep

Figure 10-4: Location of the wetland features identified in the SAIIAE Dataset (shown in green) in relation to a 500m radius (shown in yellow) of the project site (shown in red)

10.5 Mpumalanga Highveld Wetland Study (2015)

The Mpumalanga Highveld Wetland (MPHG) Wetland map provides that spatial extent of the delineated wetland features in the Mpumalanga Province. This dataset has not identified any wetland features within the boundaries of the project site, but has identified a number of natural and artificial features within a 500m radius of the project site. The natural wetlands are classified as two Flood Plain wetlands and one Seep wetland with the artificial wetlands features consisting of farm dams. The location of these features is shown in Figure 10-5.



FP = Flood Plain; SP = Seep; FD = Farm Dam

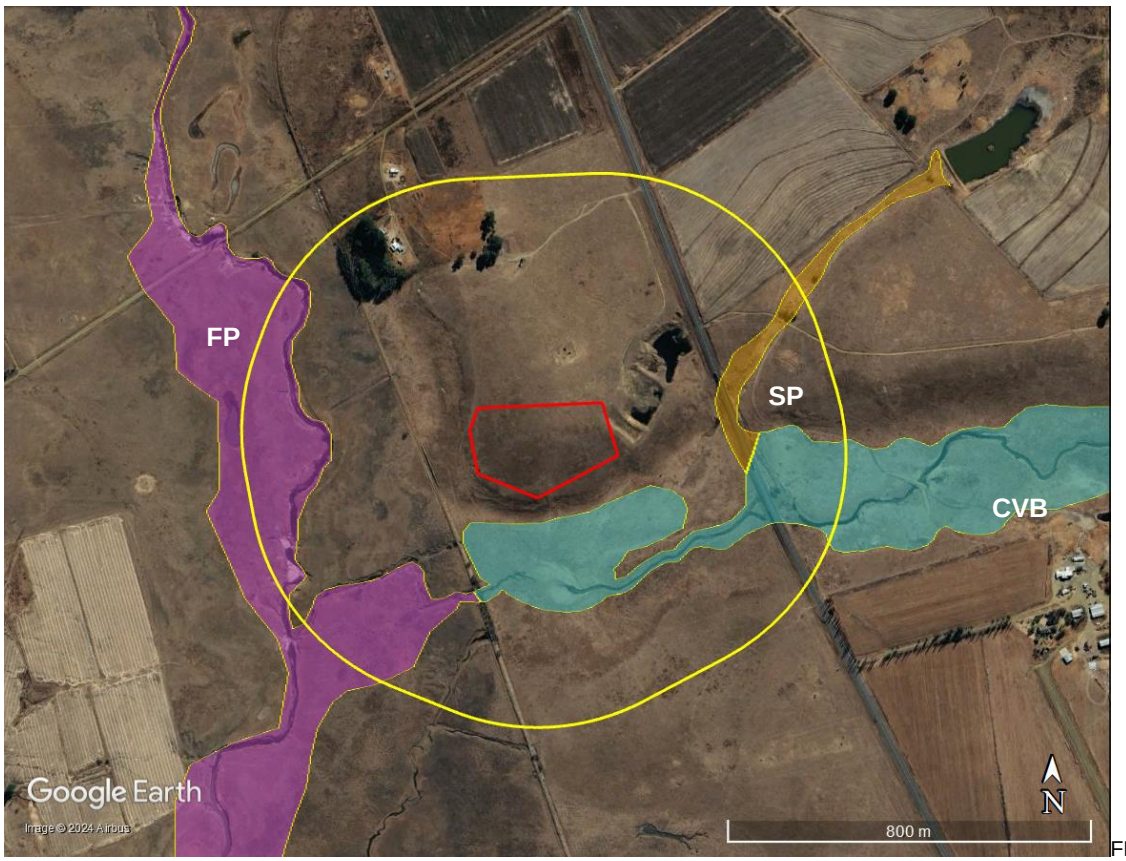
Figure 10-5: Location of the wetland features identified in the MPHG Wetland Dataset (2015)

11 FIELD ASSESSMENT FINDINGS

The findings presented in this section are based on the desktop assessment of the proposed project site.

11.1 Identification, delineation and mapping of aquatic features

The site assessment confirmed the absence of any natural wetland features within the boundaries of the project site. Furthermore, it identified three wetland features, one a Floodplain wetland (FP) associated with the Kwaggalaagte River, one a Channelled Valley Bottom wetland (CVB) associated with the Heilvleispruit and a Seep wetland (SP) within a 500m radius of the project site. The location of these features is indicated in Figure 11-1.



FP = Flood Plain; CVB = Channelled Valley Bottom; SP = Seep

Figure 11-1: Location of the wetland features identified during the field assessment (shown in green) within a 500m radius (shown in yellow) of the development site (shown in red)

Plate 11-1: Aerial view of the Channelled Valley Bottom (CVB) associated with the Heilvleispruit

Plate 11-2: Aerial view of the Flood Plain (FP) associated with the Kwaggalaagte River

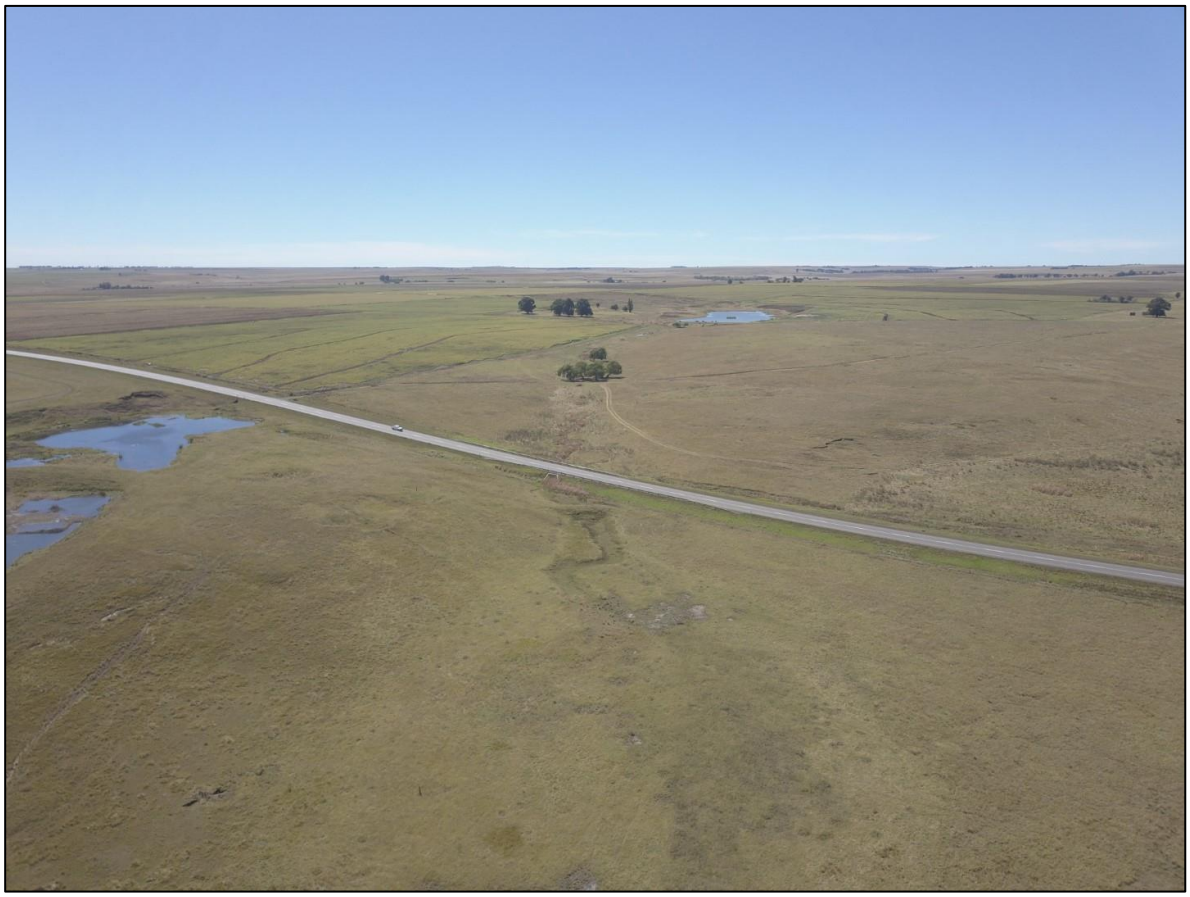


Plate 11-3: Aerial view of the Seep (SP)

No watercourses were identified within the boundaries of the project site. Three seasonal watercourses were identified within a 500m radius of the project site. The one is the Kwaggalaagte River that passes the project site to the west, the other is the Heilvleispruit that is located immediately to the south of the site and the third is the unnamed watercourse that is associated with the Seep. The latter forms a tributary of the Heilvleispruit, which in turn forms a tributary of the Kwaggalaagte River. The location of these watercourses is indicated in Figure 11-2.

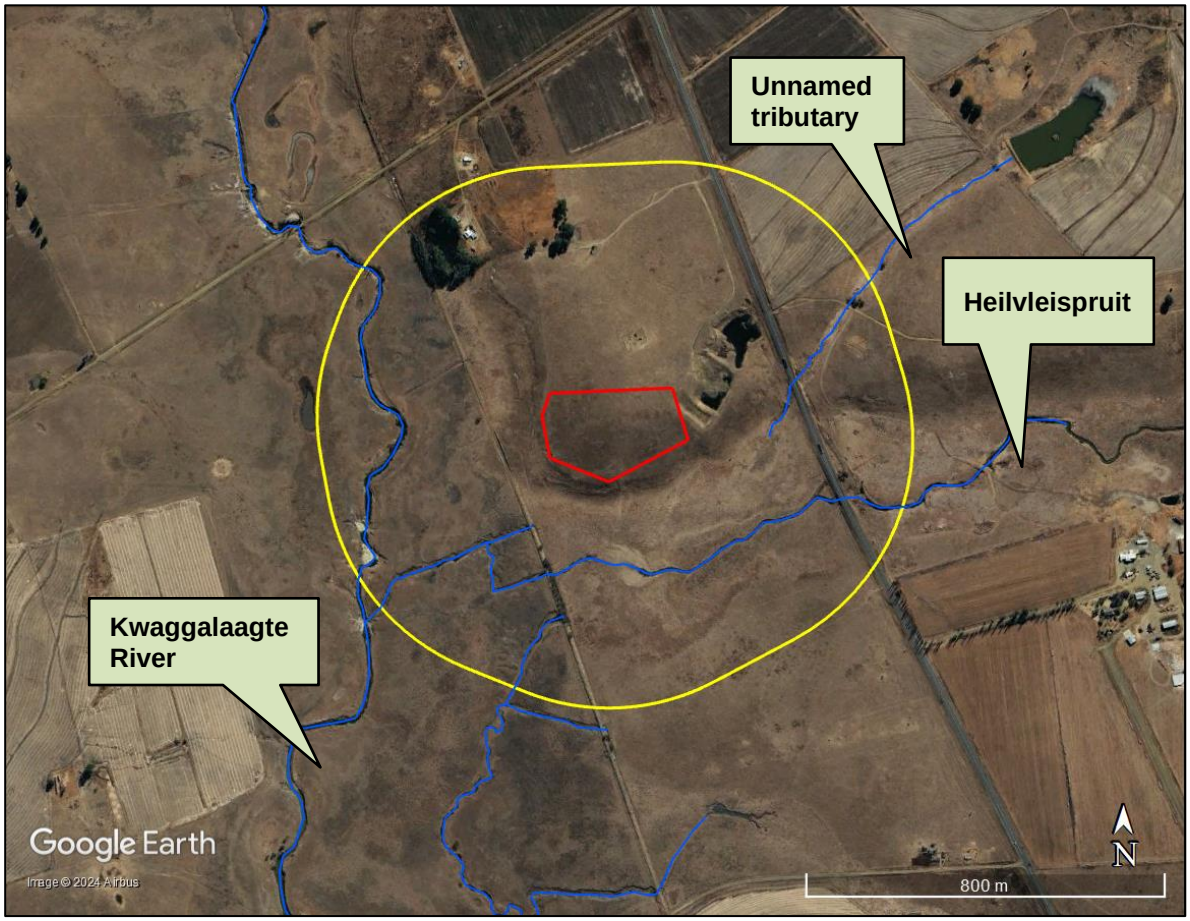


Figure 11-2: Location of the watercourses identified during the field assessment (shown in blue) within a 500m radius (shown in yellow) of the development site (shown in red)

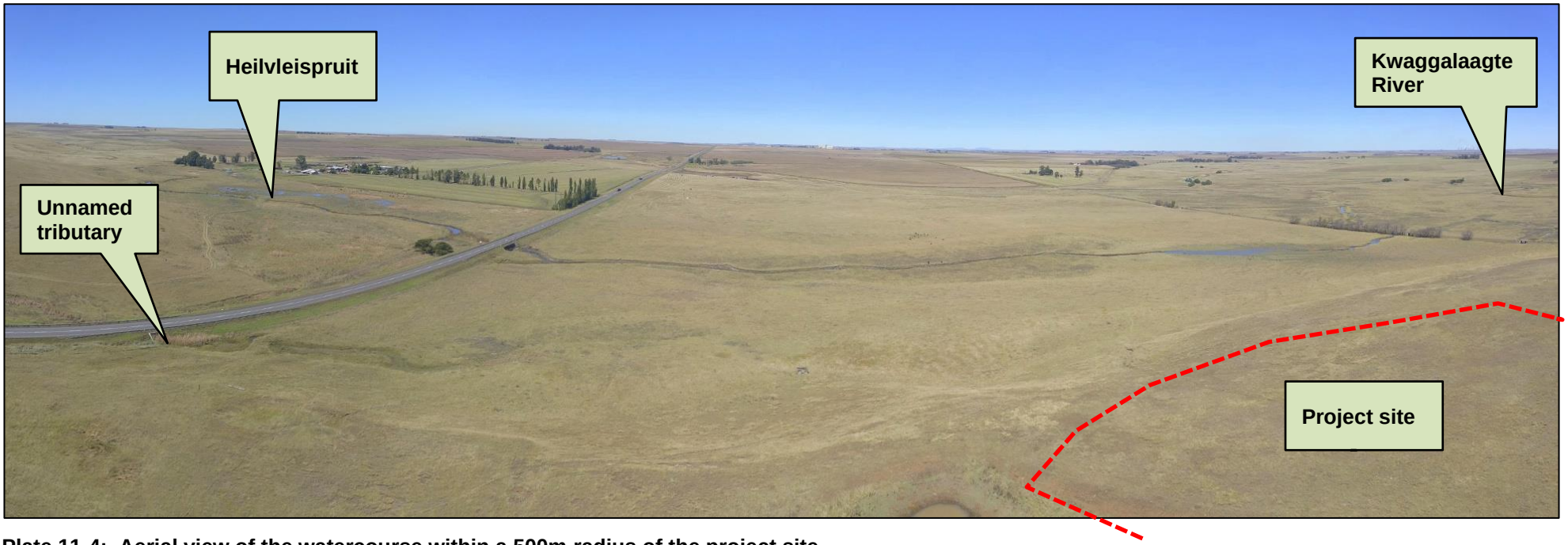


Plate 11-4: Aerial view of the watercourse within a 500m radius of the project site

11.2 Aquatic features functional assessment

The functional assessment of the wetland features all relates to the HGM Unit classification of the wetlands.

Flood Plain wetlands are typical depositional features directly associated with river channels. As such, regular water and sediment contributions from the associated river channel characterises the dynamic nature of these wetlands. The water inputs into these features are largely from the river channel, but also consists of groundwater infiltration where the water table is near the surface. Water loss from these features is via evaporation (and transpiration *via* the plants in the features) as well as infiltration.

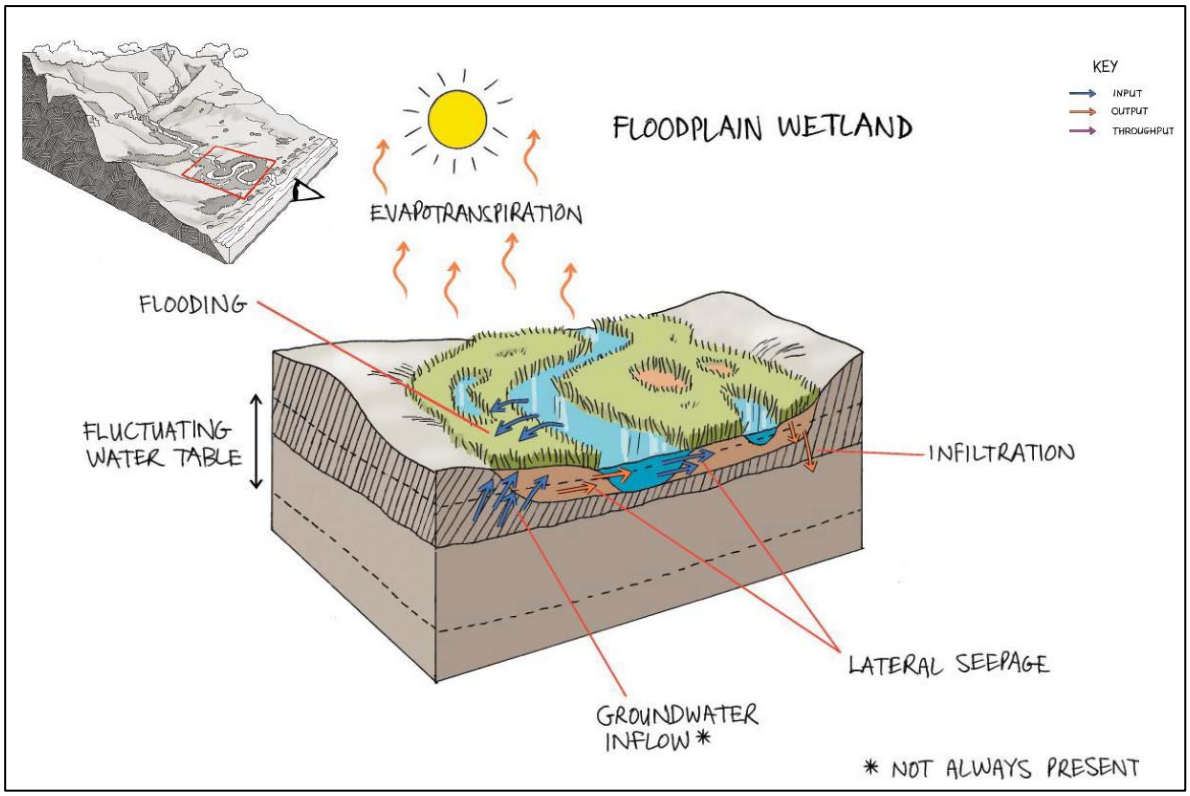


Figure 11-3: Conceptual illustration of a floodplain wetland, showing the typical landscape setting and the dominant inputs, throughputs and outputs of water.

Based on the key features of how water moves in and out of the Flood Plain, these features provide key functions in terms of sediment trapping, toxicant and nutrient assimilation, stream flow control and flood attenuation. The presence of geomorphic features such as oxbow lakes and its direct relationship with a river is a key differentiating feature of these Flood Plains and Channelled Valley Bottom wetlands.

Channelled Valley Bottom wetlands must be considered as wetland ecosystems that are distinct from, but sometimes associated with, the adjacent river channel itself, which must be classified as a 'river'. These wetlands are characterised by their location on valley floors, the absence of characteristic floodplain features and the presence of a river channel flowing through the wetland.

Figure 11-3 is a conceptual diagram of a Channelled Valley Bottom wetland, showing the dominant inputs and outputs of water. Dominant water inputs to these wetlands are from the river channel flowing through the wetland, either as surface flow resulting from flooding or as sub- surface flow, and/or from adjacent valley-side slopes (as overland flow or interflow). Water generally moves through the wetland as diffuse surface flow, although occasional, short-lived concentrated flows are possible during flooding events

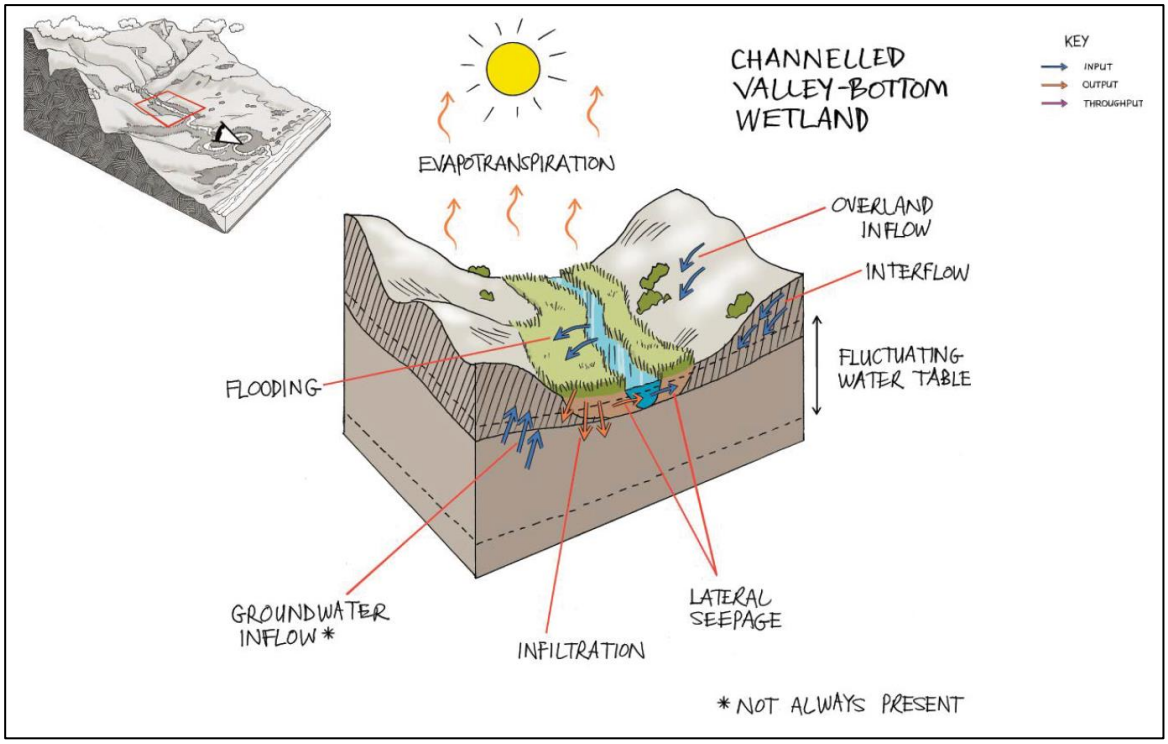


Figure 11-4: Conceptual illustration of a Channelled Valley Bottom wetland, showing the typical landscape setting and the dominant inputs, throughputs and outputs of water

Water generally exits a Channelled Valley Bottom wetland in the form of diffuse surface or subsurface flow into the adjacent river, with infiltration into the ground and evapotranspiration of water from these wetlands also being potentially significant.

Seep wetlands are typically located on gentle slopes and contain no water inflow channels. Water will typically collect in these Seep areas and due to the dense vegetation within the footprint will have a relatively high roughness coefficient that slows the movement of water to a point that infiltration into the soils is a prominent feature of these wetlands. The key water inputs into these Seeps are the interflow from the near surface groundwater that moves down the slopes as well as overland surface flow down the slopes. Evaporation and channelled outflow are key water releases from the features.

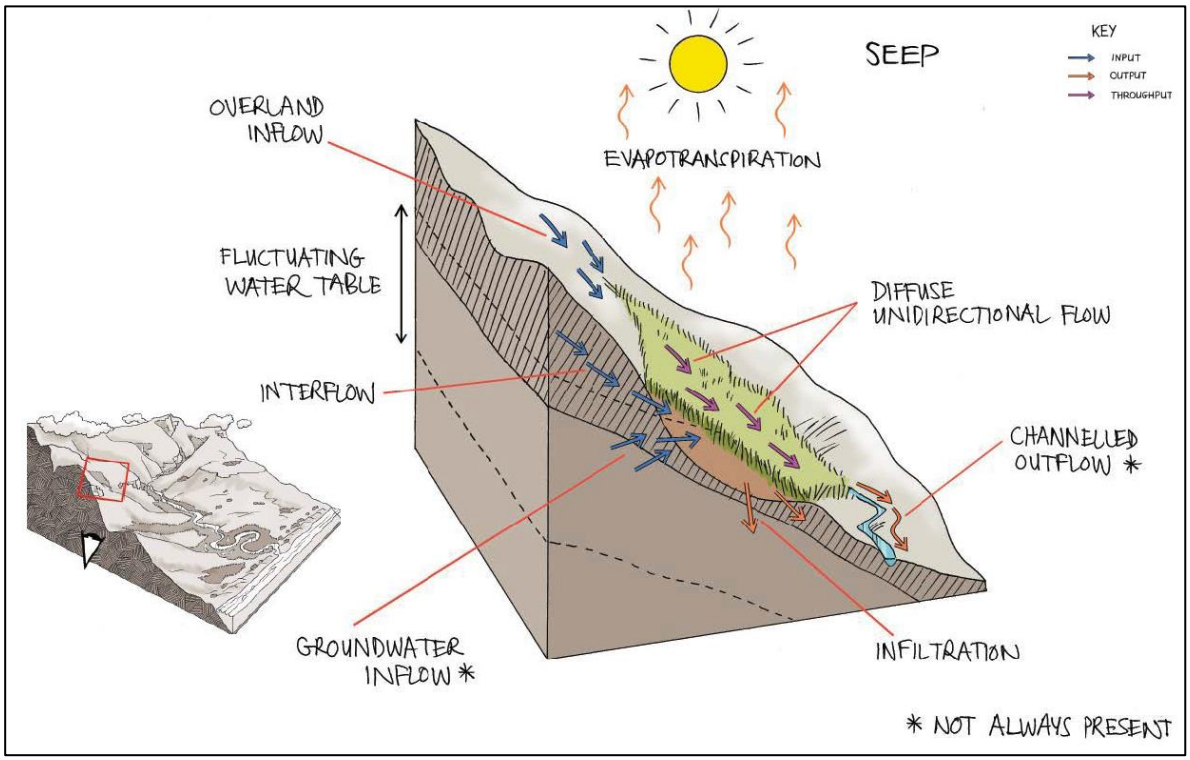


Figure 11-5: Conceptual illustration of a Seep wetland, showing the typical landscape setting and the dominant inputs, throughputs and outputs of water

Based on the hydrological characteristics of these wetlands they provide sediment, toxicant and nutrient storage functions as well as water supply particularly during the dry seasons.

Table 11-1: Ecosystem service provision by the Channelled Valley Bottom Wetlands associated with the project site

Wetland Unit					CVB	FP	SP
Ecosystem Services Supplied by Wetlands	Indirect Benefits	Regulating and supporting benefits	Flood attenuation		2.2	3.2	1.0
			Streamflow regulation		2.4	2.8	0.9
			Water Quality enhancement benefits	Sediment trapping	2.6	3.1	2.2
				Phosphate assimilation	2.2	2.0	2.7
				Nitrate assimilation	2.3	2.0	2.6
				Toxicant assimilation	2.2	2.1	2.4
				Erosion control	2.3	1.8	2.0
			Carbon storage		2.4	2.8	2.4
	Direct Benefits	**Biodiversity maintenance**					
		Provisioning benefits	Provisioning of water for human use		1.8	1.8	1.6
			Provisioning of harvestable resources		0.0	0.0	0.0
			Provisioning of cultivated foods		0.0	0.0	0.0
		Cultural benefits	Cultural heritage		0.0	0.0	0.0
			Tourism and recreation		0.0	0.0	0.0
			Education and research		1.0	1.0	1.0
Overall					**21.4**	**22.6**	**18.8**
Average					**1.53**	**1.61**	**1.34**

FP = Flood Plain; CVB = Channelled Valley Bottom; SP = Seep

The level of service provision by the wetland areas is a direct function of the impacts that are present within and within the catchment that provides water to the wetland. As a result of the impacts to the catchment of the wetland features, the level of ecosystem provision is considered to be of medium importance.

The key ecosystem services provided by the wetland features relate directly their ability to assimilate various substances that move through the catchment. These include nitrates, phosphates and toxicants while the wetlands trap sediment from the catchment which allows for the establishment of dense wetland vegetation that in turn limits the erosion in the features.

11.3 Determining the Present Ecological State of an aquatic feature

The PES of an aquatic feature is a function of the impacts that are present within the footprint of the feature as well as the catchments associated with each of these features and how these impacts affect the drivers of the wetland and watercourse. The impacts that are present in the catchment of the identified wetlands and watercourses are provided in the table below.

Table 11-2: Identified impacts on the aquatic features

HGM unit	Impacts to the catchment	Physical impacts to the wetland
Channelled Valley Bottom	• Intensive commercial agriculture (cultivation) • Civil infrastructure (roads, railway line, power lines, etc.) • Stormwater discharge from the contoured commercial agricultural areas and infrastructure • Alien invasive plant species • Farm dams	• Alien invasive plant species • Several culvert and bridge crossings • Civil infrastructure (roads) • Dam and associated impoundment • Direct stormwater discharge from agricultural areas and infrastructure • Erosion • Canalisation of water flow
Flood Plain	• Intensive commercial agriculture (cultivation) • Civil infrastructure (roads, railway line, power lines, etc.) • Stormwater discharge from the contoured commercial agricultural areas and infrastructure • Alien invasive plant species • Farm dams	• Alien invasive plant species • Several culvert and bridge crossings • Civil infrastructure (railway line, roads) • Dam and associated impoundment • Direct stormwater discharge • Erosion • Canalisation of water flow
Seep	• Intensive commercial agriculture (cultivation) • Civil infrastructure (roads, railway line, power lines, etc.) • Stormwater discharge from the contoured commercial agricultural areas and infrastructure	• Alien invasive plant species • Dam and associated impoundment • Direct stormwater discharge from agricultural areas and infrastructure • Erosion

HGM unit	Impacts to the catchment	Physical impacts to the wetland
	• Alien invasive plant species • Farm dam	
Watercourses	• Intensive commercial agriculture (cultivation) • Civil infrastructure (roads, railway line, power lines, etc.) • Stormwater discharge from the contoured commercial agricultural areas and infrastructure • Alien invasive plant species • Farm dams	• Alien invasive plant species • Several culvert and bridge crossings • Civil infrastructure (railway line, roads) • Dam and associated impoundment • Direct stormwater discharge • Erosion • Canalisation of water flow

Plate 11-5: Aerial view of the road and culvert crossing through the Channelled Valley Bottom

Plate 11-6: Aerial view of the culvert and road crossing the Seep as well as the dam and impoundment area

Plate 11-7: Aerial view of the railway and culvert crossings in the Flood Plain as well as the canalised water flow

Present PES and EIS assessments of watercourses were constrained as no technique is currently suitable for their assessments. Professional opinion and an extrapolation of principles from other methods were used to approximate PES and EIS for watercourse that is present on the study site.

The impacts identified in the table above were used in the Level 1 WET-Health assessment to determine the PES of the wetland system. The results of the Level 1 assessment are provided in the table below.

Table 11-3: Present Ecological State (PES) of the system

HGM Unit	Driver			
	Hydrology	Geomorphology	Vegetation	Combined score
Channelled Valley Bottom	3.1	4.2	4.7	**3.3 = Class C Moderately modified**
Flood Plain	3.5	4.1	4.2	**3.8 = Class C Moderately modified**
Seep	4.1	4.0	3.2	**3.8 = Class C Moderately modified**
Watercourses	4.2	4.3	3.2	**3.9 = Class C Moderately modified**

The PES of all the wetland features included in this study are classified as Class C features that are considered to be moderately modified as a result of the impacts within the catchments as well as within their physical footprints.

The watercourses are classified as Class C features that have been moderately modified which has resulted in moderate changes to the ecosystem processes that has resulted in the loss of natural habitat and biota from the feature.

11.4 Determining the Ecological Importance and Sensitivity of aquatic features

The Ecological Importance of any aquatic feature is an expression of its importance to the maintenance of the ecological diversity and functioning within itself, as well as hydrologically downstream. The Ecological Sensitivity is a function of the system's ability to resist disturbances on its drivers and its capability to recover from these disturbances once they have occurred. The status of the Channelled Valley Bottom wetlands as well as the watercourses within the study site is provided in the table below.

Table 11-4: Ecological importance and sensitivity of the aquatic system

HGM Unit	Criteria	Importance	EIS Class	Overall importance and sensitivity
Channelled Valley Bottom	Ecological importance and sensitivity	2.0	M	**Medium**
	Hydrological/functional importance	2.3	M	
	Direct human benefits	0.5	L	
Flood Plain	Ecological importance and sensitivity	2.1	M	**Medium**

HGM Unit	Criteria	Importance	EIS Class	Overall importance and sensitivity
	Hydrological/functional importance	2.5	M	
	Direct human benefit	0.5	L	
Seep	Ecological importance and sensitivity	1.0	L	**Low**
	Hydrological/functional importance	2.0	M	
	Direct human benefits	0.5	L	
Watercourses	Ecological importance and sensitivity	2.2	M	**Medium**
	Hydrological/functional importance	2.0	M	
	Direct human benefits	0.5	L	

The overall Ecological Importance and sensitivity of the aquatic features associated with the site are presented in Table 11-4. All the features except the Seep wetland have Medium importance and sensitivity with the Seep wetland being classified to have a Low importance and sensitivity. This is a function of the moderately modified PES of the features and the associated intermediate levels of ecosystem services provision by the features.

11.5 Buffer determination

Based on the findings of the assessment, the location and extent of the aquatic features, the PES of the aquatic features, the ecosystem services provided by the system and the EIS of the aquatic features, a buffer of 40m around the edge of the wetland systems is recommended. This buffer must be in place for the duration of the operational phase of the borrow pit.

It is also important to note that in accordance with the Mineral and Petroleum Resources Development Act (Act No. 28 of 2002) no part of the borrow pit operations (stockpiles, crushers, plant parking, etc.) is allowed to be outside of the boundaries of the borrow pit.

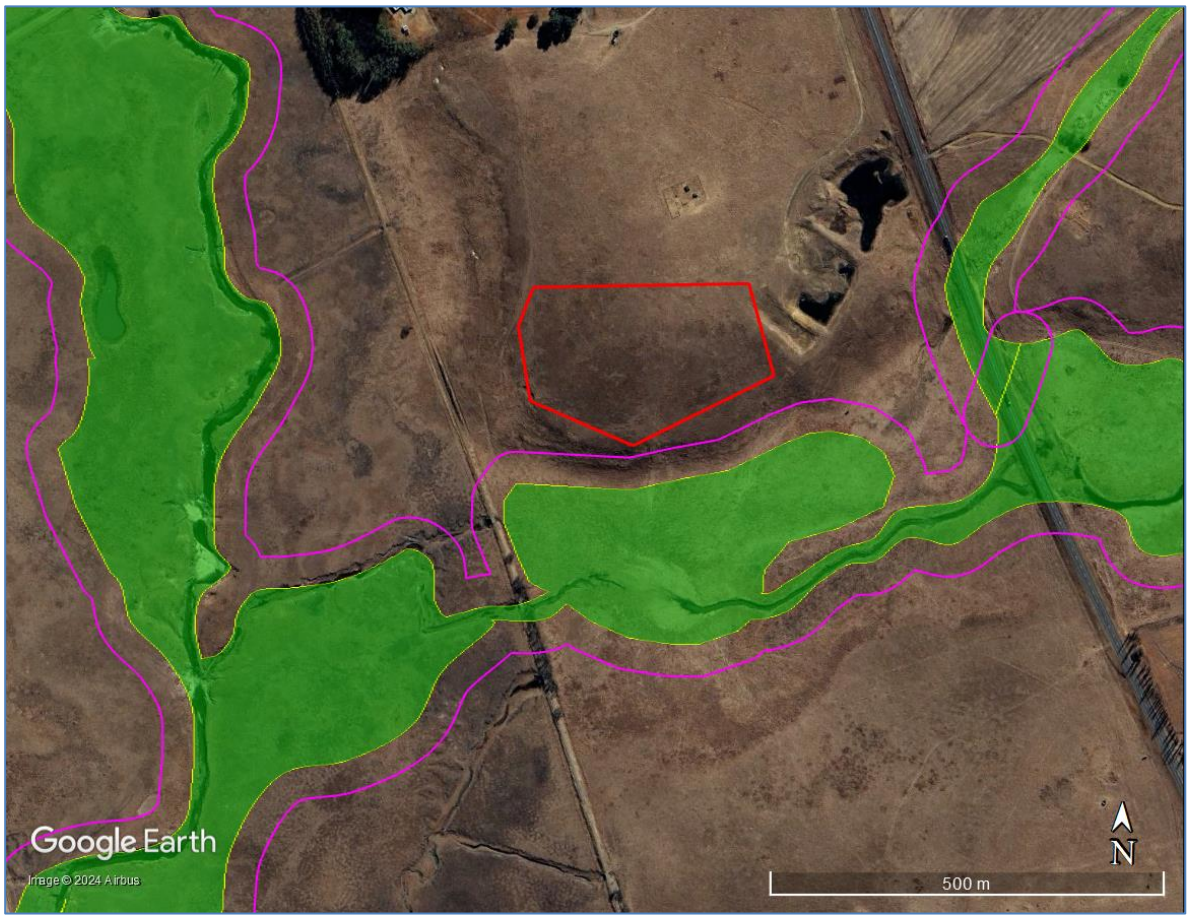


Figure 11-6: Location and extent of the applicable 40m buffer (in purple) around the wetland features nearest to the project site (shown in red)

12 RISK / IMPACT ASSESSMENT

The impact assessment in this report aims to identify and assess the significance of the potential impacts associated with the establishment and operation of the borrow pit. For the purposes of this assessment, the Standardised Risk (or Impact) Assessment Matrix as specified by the Department of Water and Sanitation will be used to assess the impacts in the “regulated area of the watercourse” as defined in the National Water Act (Act No. 36 of 1998).

The ”regulated area of a watercourse” as defined in the Act make provision for the following:

a) 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 or a river, spring, natural channel, lake or dam;

b) In the absence of a determined 1 in 100 year flood line or riparian area the area within 100m from the edge of a watercourse where the edge of the watercourse is the first identifiable annual bank fill flood bench; or

c) A 500m radius from the delineated boundary (extent) of any wetland or pan.

The extent of this “regulated area of a watercourse as it pertains to the Risk Assessment is shown in Figure 12-1. It is clear that the entire borrow pit area falls within the “regulated area of a watercourse” as defined by the regulations.

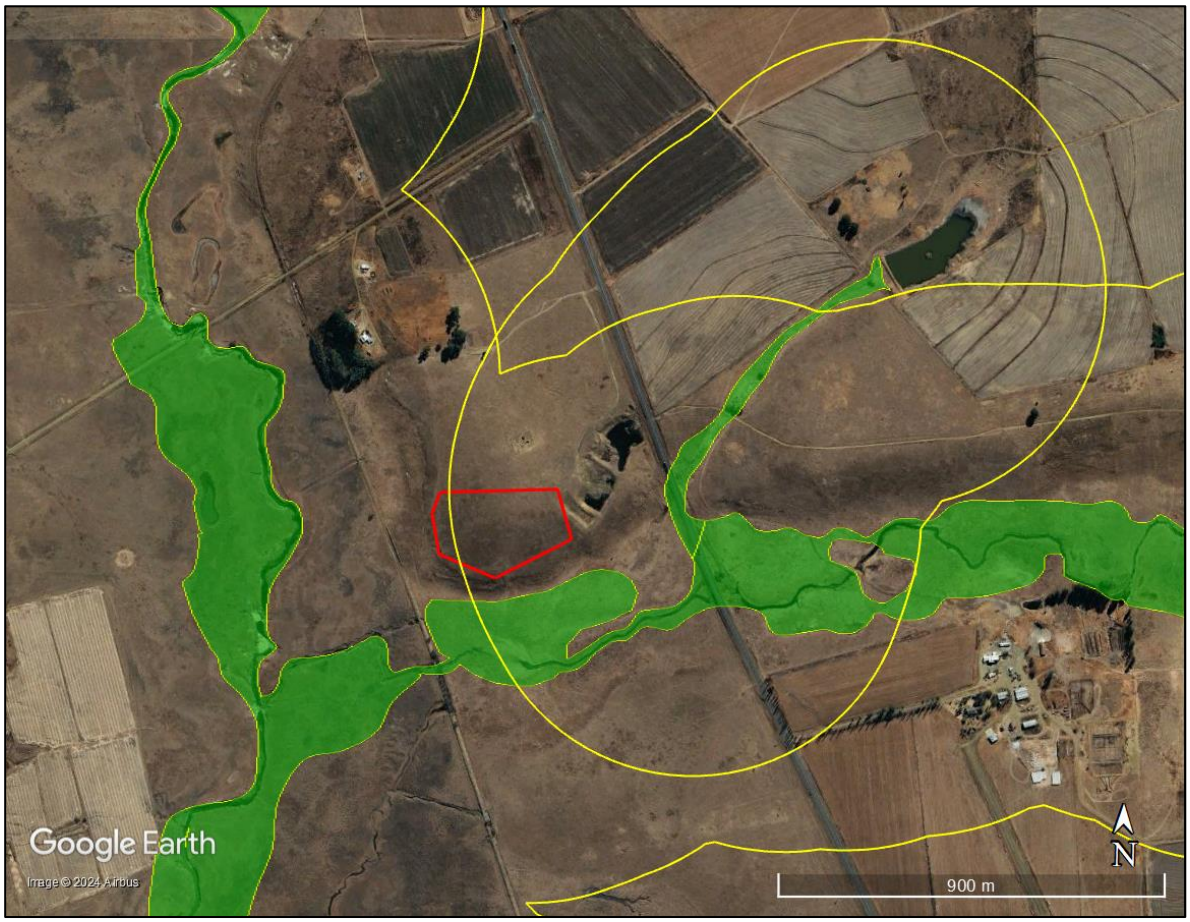


Figure 12-1: Extent of the “regulated area of a watercourse” shown in yellow around the wetland features nearest to the project site

The Risk Assessment Matrix makes provision for the identification of risks at the various phases applicable to the project (establishment and operational) and assesses these to determine the magnitude of the risk / impact to be low, medium or large. Provision is also made for pre- and post-mitigation assessment.

The results of the Risk (or Impact) Assessment Matrix are provided in Table 12-1. The full matrix is provided in Appendix B.

Table 12-1: Results of the Department of Water and Sanitation Risk Assessment Matrix

No.	Phase	Activity	Impact	Risk Rating	Control measures
Pre-mitigation	Establishment and operational	Inadequate stormwater management from the borrow pit area	(1) The changes to the runoff from the areas subjected to the earthworks may impact on the hydrological driver of the aquatic features during the establishment period which could impact on the PES of the features. (2) The removal of vegetation as a result of the earthworks may result in increased levels of silt that is washed into the aquatic features which may impact on the biota in the features. (3) The excavations that are made to open the borrow pit may decrease the amount of runoff from the borrow pit area as the water will accumulate in the excavations. This will impact the hydrological driver of the features which may impact the PES of the features. (4) Higher sediment loads washing of the stockpiles within the borrow pit site may result in an impact on the water quality in the aquatic features which will result in an impact on the PES of these features.	Low Risk	A Stormwater Management Plan must be developed before the establishment of the borrow pit can commence. This management plan must make provision for the following key principles: (1) Diversion of all stormwater runoff from above (north) the borrow pit area around the borrow pit. (2) All stormwater that accumulates in the excavated areas within the borrow pit after rainfall events must be discharged in a controlled manner into the environment. The discharge must be controlled to ensure that the pre-development runoff does not exceed the post-development runoff. (3) Provision must be made for the capturing of any silt that may wash from the material stockpile areas to ensure that the silt is not released directly into the environment. (4) No uncontrolled stormwater runoff must be allowed to the south, east and west of the borrow pit area. (5) The stormwater management plan must be submitted for approval by the Seriti Green.
Post-mitigation				Low Risk	
Pre-mitigation		Risk of hydrocarbon (fuels and oils) contamination of the aquatic features by leaking plant and equipment that will be used for the earthworks and operation of the borrow pit.	Hydrocarbons are toxic to aquatic plants and animals and are readily spread by flowing water.	Low Risk	(1) All plant and equipment that will be used in the construction activities must be inspected on a regular basis to ensure that any leaks are detected as soon as possible. (2) Any leaking plant and equipment must be removed from the construction site and only be allowed to return when the leaks have been addressed. (3) A Spill Contingency Plan must be in place for the duration of the construction phase that details the steps that needs to be taken if spills of various sizes are to occur. (4) No plant or equipment will be allowed to be parked overnight within a 40m buffer from the delineated edge of any aquatic feature.
Post-mitigation				Low Risk	

No.	Phase	Activity	Impact	Risk Rating	Control measures
Pre-mitigation		Storage of hydrocarbons on site, and the inadequate management of petrochemical storage facilities will pose a risk.	Leakages and spillages from the planned petrochemical storage facility may result in the contamination of the existing water quality in the aquatic features	Low Risk	(1) In the event that any hydrocarbon materials are to be stored within the site during the operational phase, provision must be made that the storage facility is fully bunded in a bund that has a volume of 110% of the total volume of hydrocarbons that are stored. (2) The bund must be provided with a closable drainage tap for use when fluid needs to be drained from the bund. (3) The hydrocarbon storage facility may not be located within the 35m buffer from the delineated edge of any aquatic feature. If the edge is not known during the establishment of the storage feature, this must be delineated by an aquatic specialist before implementation. (4) A Spill Contingency Plan must be in place for the construction phase that details the management and mitigation actions that needs to be undertaken in the event of any spillages from the hydrocarbon storage facility.
Post-mitigation				Low Risk	
Pre-mitigation		Risk of contamination of the aquatic features by the on-site ablution facilities.	Spillage or leakage could impact on the water quality that moves through the aquatic features, which could decrease the PES of the features.	Low Risk	(1) All portable ablution facilities that will be used on site must be located 40m away from the edge of the delineated aquatic feature. If the edge is not clearly defined, this must be done by an aquatic specialist before implementation of the ablutions can take place. (2) The portable ablution facilities must be provided with sealed wells in which the sewage is collected. (3) The servicing of these portable ablution facilities must be conducted by a registered service provider who must dispose of the material at a Municipal facility. (4) A Spill Contingency Plan must be put in place to provide the appropriate management and mitigation measures to be implemented in the event of any spillages from these ablution facilities.
Post-mitigation				Low Risk	

13 MANAGEMENT AND MITIGATION MEASURES

The management and mitigation measures as they relate to the risks associated with the aquatic features are provided in Table 12-1. These measures must be included in the Environmental Management Programme Report and Operational Management Plan for the construction and operational phases of the borrow pit.

14 MONITORING REQUIREMENTS

It is recommended that an Environmental Control Officer, who meets the requirements of the NEMA: EIA Regulations (2014) as amended, be appointed to conduct monthly audits of the establishment of the project. An audit report must be completed for each monthly audit and be submitted to the relevant authority.

15 CONCLUSION

The assessment of the DFFE Online Screening Tool has indicated that the Aquatic Theme for the project area has a sensitivity rating of “LOW”. This sensitivity rating can be confirmed as there are no aquatic features within the boundaries of the project site or within a 32m radius of the site.

The entire project site is located within the “regulated area of a watercourse” as defined by the National Water Act (Act No. 36 of 1998). The aquatic features that enact this “regulated area of a watercourse” consist of a Channelled Valley Bottom wetland approximately 55m to the south, a Flood Plain wetland approximately 300m to the west and southwest and a Seep wetland approximately 250m to the east of the project site boundaries. All the watercourses that have been identified in the vicinity of the project site are in excess of 100m from the boundary of the site. The Heilvleispruit channel is approximately 180m to the south of the site, the Kwaggalaagte River approximately 300m to the west and the small unnamed tributary approximately 260m to the east.

The PES of all the wetland areas were classified to be Class C features, which indicates a moderate modification of the features which impacts on their ecosystem service delivery. The habitat within these features is relatively intact and will stay in the same state in the absence of any interventions. The EIS of the features are classified to be of medium (Channelled Valley Bottom and Flood Plain wetlands) and low (Seep wetland) significance and is aligned with the Class C PES.

The potential risks/impacts related to the establishment and operation of the borrow pit are primarily associated with the management of any stormwater runoff from the borrow pit site and as such, the requirement for a Stormwater Management Plan ensuring stormwater separation and control must be put in place. If these risk/impacts are managed appropriately, the risk of the project impacting on the current PES, EIS and ecosystem service status of the features has been determined to be “LOW” risk in accordance with the Department of Water and Sanitation Risk Assessment Matrix as updated in December 2023.

Based on the findings of the assessment, it is the opinion of the specialist that there is no fatal flaw linked to the aquatic features assessed that will prevent the project from being approved. In addition, with the implementation of the control measures (management and mitigation) into the Environmental Management Program Report and Operational Management Plan, any threat that the development may pose to the aquatic environment is nullified.

16 REFERENCES

Department of Water and Sanitation Report – Wetland and riparian habitat delineation document;

Department of Water and Sanitation Report – Risk Assessment Protocol and associated Matrix;

MUCINA, L. and RUTHERFORD, M.C. (eds.), 2006. The Vegetation of South Africa, Lesotho and Swaziland. Strelitzia Publishers.

South African National Biodiversity Institute – Wetland buffer guideline document;

South African National Biodiversity Institute – Classification System for Wetlands and other Aquatic Ecosystems in South Africa (Ollis *et al.*, 2013)

Water Research Commission Report TT659/16 – High Risk Wetland Atlas;

Water Research Commission Report TT339/08 – WET-EcoServices a technique for rapidly assessing ecosystem services supplied by wetlands; and

Water Research Commission Report TT340/08 – WET-Health a technique for rapidly assessing wetland health.

APPENDIX A

SPECIALIST CURRICULUM VITAE

Magnus van Rooyen

Technical Director - Environment

CORE SKILLS

- Environmental Impact Assessment
- Specialist Ecological (Terrestrial and Aquatic) Assessment
- Environmental Screening Assessment
- Due Diligence Assessment and Feasibility Studies
- Mining Applications
- Environmental Management Programmes and Plans
- Strategic Environmental Assessments
- Wildlife Management Plans

DETAILS

Qualifications

- MPil. Environmental Management
- BSc (Hon) Botany
- BSc (Botany and Zoology)
- Post Graduate Certificate in Education (Science and Biology)

Memberships

- South African Council for Natural Scientific Professions (Pr. Sci. Nat. 400335/11)
- International Association of Impact Assessors (Ref No. 1839)

Languages

- Afrikaans - fluent
- English - fluent
- German - fair
- Zulu - communication

Countries worked in:

South Africa, Namibia, Lesotho, Mozambique, Botswana, Guinea, Liberia, United States, United Kingdom

PROFILE

Mr van Rooyen is currently a Technical Director – Environment and the Branch Manager of the KwaZulu-Natal Office of GCS in Durban.

In addition to holding a Masters degree in Environmental Management, he also holds a BSc degree in Botany and Zoology, an Honors degree in Botany and a Post Graduate Certificate in Education. He has in excess of 18 years' experience in the environmental consulting field through conducting and managing Environmental Impact Assessments, Specialist Terrestrial and Aquatic Ecology Assessments and Strategic Environmental Management inputs into various project feasibility studies.

Through these services, he has been exposed to projects in a range of sectors which include the general public infrastructure sector (national and provincial roads, harbour and rail developments, water (dams and supply) and wastewater (treatment works and reticulation), private infrastructure sector (small and large scale housing developments, lodges, private dams, etc.), agricultural sector (dams, establishment of orchards, plantations and feedlots), mining sector (coal mines, gold mine, manganese mines, aggregates and associated mining infrastructure) and the industrial sector (light and heavy industrial infrastructure development).

In addition, Mr van Rooyen has extensive experience in conducting specialist terrestrial and aquatic ecological assessments for various infrastructure (roads, dams, ports) and industrial (smelters, power plants) development projects in a number of diverse ecosystems across Africa. He has experience in the compilation of Resettlement Policy Framework Plans, Due Diligence Assessments and Feasibility Studies associated with infrastructure development projects. Mr van Rooyen has experience in working on various private and public sectors as well as rural and urban environments in various countries

Previous Experience

Client	Project Description	Role/ Responsibility
Private client	**Wetland Assessment for the farm dam on the Farm Compentation near Matatiele** Undertaking of the wetland assessment for the development of an irrigation dam on the Farm Compensation near Matatiele in KwaZulu-Natal.	Wetland Specialist
Senekal Boerdery	**Wetland and Biodiversity Assessment for the Mkuze Township Establsishment** Undertaking of the wetland and biodiversity assessment associated with the township establishment in the town of Mkuze, KwaZulu-Natal.	Wetland and Biodiversity Specialist
WSP Consulting	**Wetland Assessment associated with the establishment of a flood protection berm at the SAPPI Saiccor Mill** Undertaking of the wetland assessment for the construciton of a flood protection berm between the uMkomaas River and the SAPPI Saiccor Mill in KwaZulu-Natal.	Wetland Specialist
Transnet National Ports Authority	**Forest mapping within the Port of Richards Bay** Undertaking of the mapping and classification of all the indigenous forest areas withini the Port of Richards Bay, KwaZulu-Natal.	Biodiverstiy Specialist
RHDHV	**KwaMathanya Water Supply Scheme Wetland Assessment** Undertaking of the wetland assessment of the KwaMathanya water supply scheme near town of Ixopo in KwaZulu-Natal.	Wetland Specialist
Private client	**Brownsdrift Hydropedological Assessment** Undertaking of the wetland and hydropedological assessment associated with the proposed residential developmnet on the site in Browndrift, eThekwini Municipality, KwaZulu-Natal.	Wetland Specialist
GreenScene Environmental	**Wetland and Biodiversity Assessment for a residential property in Pumula** Undertaking of the wetland and biodiversity assessment for the residential development on Lot 967 Pumula, KwaZulu-Natal.	Wetland and Biodiversity Specialist
GreenScene Environmental	**Wetland and Biodiversity Assessment for Lot 962 and 965 Port Edward** Undertaking of the wetland and biodiversity assessment for the residential development on Lot 962 and 965 Port Edward, KwaZulu-Natal.	Wetland and Biodiversity Specialist
Msunduzi Municipality	**Wetland and Biodiversity Assessment for various Military Veterans Housing sites within the Msuduzi Municipality** Undertaking of the wetland and biodiversity assessment for the various sites earmarked for the establishment of residential houses for the Military Veterans in the Msunduzi Municipality, KwaZulu-Natal.	Wetland and Biodiversity Specialist
Private client	**Forest delineation of a private property in Munster** Undertaking of the delineation of the forest margins on the residential property in Munster, KwaZulu-Natal.	Biodiverstiy Specialist

Previous Experience

Client	Project Description	Role/ Responsibility
JG Afrika (Pty) Ltd	**Gunyana Water Supply Scheme Wetland and Biodiviersity Assessment** Undertaking of the wetland and biodiverstiy assessment of the Gunyana community water supply scheme near town of Pomeroy in KwaZulu-Natal.	Wetland and Biodiversity Specialist
GreenScene Environmental	**Wetland and Vegetation Assessment associated with the construction of the Ingwebaba Pedestrian Bridge near Shelly Beach** Undertaking of the wetland and vegetaiton assessment for the construction of the Ingwebaba Pedestrian Bridge near Shelly Beach in KwaZulu-Natal.	Wetland and Biodiversity Specialist
Terratest (Pty) Ltd	**Wetland and Vegetation Assessment associated with the construction of the KwaHlokohloko Rural Water Supply Scheme near Eshowe** Undertaking of the wetland and biodiverstiy assessment of the KwaHlokoloko community water supply scheme near town of Eshowe in KwaZulu-Natal.	Wetland and Biodiversity Specialist
Coastal Macadamias	**Wetland Assessment associated with the development of an irrigation dam for Coastal Macadamias near Ramsgate** Undertaking of the wetland assessment for the development of an irrigation dam for the Coastal Macadamias property near Ramsgate, KwaZulu-Natal.	Wetland Specialist
South African National Roads Agency Limited	**Ballito to Tinley Manor Wetland and Biodiveristy Assessment** Undertaking of the wetland and biodiversity study to support the preliminary design for the upgrade of the N3 between Ballito and Tinley Manor.	Wetland and Biodiversity Specialist
Vale Limitada	**Biodiversity Assessment for the alternative water supply pipeline** Undertaking of the biodiversity assessment to suport the preliminary design of the proposed alternative water supply pipeline at the Moatize Mine in Tete, Mozambique.	Biodiversity Specialist
GIB Consulting Engineers	**Aquadene Wetland Assessment** Undertaking of the wetland assessment for the Aquadene housing development in Richards Bay.	Wetland Specialist
JG Afrika (Pty) Ltd	**Wetland Assessment for the pipeline route for the drought relief pipeline in Laingsburg** Undertakaing of the wetland assessment assocaited with the 25km pipeline route from the watersource to the town of Laingsburg in the Western Cape.	Wetland Specialist
Seche International	**Wetland and Biodiversity Assessment for the proposed new uMgungundlovu Landfill Site** Preliminary wetland and biodiversity assessment for the proposed new uMgungundlovu Landfill site outside of Pietermaritzburgg.	Wetland and Biodiversity Specialist
South African National Roads Agency Limited	**Wetland and Vegetation Assessment associated with the upgrading of the N1 between Heuningspruit and Koppies** Undertaking of the wetland and biodiversity assessment for the upgrading of the N1 between Heuningspruit and Koppies in the Freestate Province.	Wetland and Biodiversity Specialist

Previous Experience

Client	Project Description	Role/ Responsibility
Terratest (Pty) Ltd	**Wetland and Vegetation Assessment associated with the upgrading of the Nelson Mandelar Museum at Qunun** Undertaking of the wetland and vegetation assessment associated with the upgrading of the Nelson Mandela Museum in Qunu in the Eastern Cape Province.	Wetland and Biodiversity Specialist
GreenScene Environmental	**Wetland and Vegetation Assessment associated with the construction of the Ulundi Water Supply Scheme** Undertaking of the wetland and biodiverstiy assessment of the Ulundi water supply scheme near town of Eshowe in KwaZulu-Natal.	Wetland and Biodiversity Specialist
MOZAL	**Biodiversity Assessment for the raw water supply pipeline for the Mozal Aluminium Smelter in Mozambique** Undertkaing of the biodiversity assessment for the raw water supply pipeline from the desalination plant in the Port of Matola to the MOZAL smelter int Boane, Maputo, Mozambique.	Biodiversity Specialist
JG Afrika (Pty) Ltd	**Wetland and Biodiveristy Assessment for various water supply schemes in the Cedarberg Municpality** Undertaking of the wetland and biodiversity assessments for the water supplys schemes for the town of Whupperthal, Clanwilliam and Citrusdal in the Western Cape.	Biodiversity Specialist
uKhozi Environmentalists	**Phalanndwa Coal Mine Biodiversity and Wetland Assessment** Undertaking the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the Phalanndwa Coal Mine Expansion near Delmas.	Wetland and Biodiversity Specialist
Kongiwe Environmental Consultants	**Lephalale Coal Mine Biodiversity and Wetland Assessment** Undertaking the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the Lephalale Coal Mine near Lephalale.	Wetland and Biodiversity Specialist
Nzingwe Consultancy	**Riversdale Coal Mine Wetland Assessment** Undertaking the wetland specialist study in support of the Application for Environmental Authorisation and the Water Use Licence Application for the Riversdale Coal Mine near Vryheid.	Wetland Specialist
WSP Environmental	**SAPPI Saiccor Wetland Assessment** Undertaking the wetland specialist study in support of the Application for Environmental Authorisation for the construction of flood protection	Wetland Specialist

Client	Project Description	Role/ Responsibility
	measures associated with the SAPPI Saiccor Mill, uMkomaas.	
WSP Environmental	**11th Avenue Interchange Wetland Assessment** Undertaking the wetland specialist study in support of the Application for Environmental Authorisation for the construction of the 11th Avenue Interchange, Durban	Wetland Specialist
WSP Environmental	**SAPPI Saiccor Alien Invasive Plant – Risk Assessment** Undertaking of the risk assessment of the presence of various listed category I and II alien invasive plant species on the SAPPI Saiccor Mill site, uMkomaas.	Vegetation Specialist
Environmental Resources Management	**Bhangazi Community Tented Camp Wetland and Biodiversity Assessment** Undertaking of the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the establishment of the Bhangazi Community Tented Camp in the isiMangoliso Wetland Park, St. Lucia.	Wetland and Biodiversity Specialist
South African National Roads Agency Limited	**N3 – Market Road Interchange Wetland and Biodiversity Assessment** Undertaking of the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the upgrading of the N3 – Market Road Interchange, Pietermaritzburg.	Wetland and Biodiversity Specialist
ESKOM SOC	**ESKOM 22 kVA Lines Vegetation Assessments** Undertaking of vegetation assessments for the establishment of various 22kVA electrification lines in KwaZulu-Natal.	Vegetation Specialist
ESKOM SOC	**Tombo to Mafini 300kVA Line Vegetation Assessments** Undertaking of vegetation assessment for the route alignment of the 300kVA high voltage electricity line from the Tombo Substation to Mafini, Port St. Johns.	Vegetation Specialist
Element Consulting Engineers	**Port St. Johns Water Treatment Works Wetland and Biodiversity Assessment** Undertaking of the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the establishment of the Port St. Johns Water Treatment Works, Port St. Johns.	Wetland and Biodiversity Specialist
South African National Roads Agency Limited	**N2 – uMgeni Road Interchange Wetland and Biodiversity Assessment** Undertaking of the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the upgrading of the	Wetland and Biodiversity Specialist

Client	Project Description	Role/ Responsibility
	N2 – uMgeni Road Interchange, Durban.	
South African National Roads Agency Limited	**N2 – Mt Edgecombe Interchange Wetland and Biodiversity Assessment** Undertaking of the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the upgrading of the N2 – Mt Edgecombe Interchange, Durban.	Wetland and Biodiversity Specialist
Afrimat	**Ladysmith Quarry Wetland and Biodiversity Assessment** Undertaking the wetland and biodiversity specialist study in support of the Mining Right Application for the establishment of the Afrimat Quarry, Ladysmith.	Wetland and Biodiversity Specialist
South African National Roads Agency Limited	**N3 – Epworth Road Interchange Wetland and Biodiversity Assessment** Undertaking of the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the upgrading of the N3 – Epworth Road Interchange, Pietermaritzburg	Wetland and Biodiversity Specialist
Millennium Challenge Account - Mozambique	**Nacala Dam rehabilitation Biodiversity Assessment** Undertaking of the biodiversity specialist study in support of the Application for an Environmental Permit for the rehabilitation and raising of the Nacala Dam, Mozambique.	Biodiversity Specialist
WSP Environmental	**SAPPI Ngodwana Mill Expansion Wetland and Biodiversity Assessment** Undertaking of the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the expansion of the Ngodwana Mill, Waterval Boven.	Wetland and Biodiversity Specialist
South African National Roads Agency Limited	**N3 – Chota Motala Road Interchange Wetland and Biodiversity Assessment** Undertaking of the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the upgrading of the N3 – Chota Motala Road Interchange, Pietermaritzburg.	Wetland and Biodiversity Specialist
South African National Roads Agency Limited	**R30 Glen Lyon to Brandfort Wetland and Biodiversity Assessment** Undertaking of the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the upgrading of the R30 between Glen Lyon and Brandfort.	Wetland and Biodiversity Specialist
South African National Roads Agency Limited	**R30 Virginia to Beatrix Mine Wetland and Biodiversity Assessment** Undertaking of the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the upgrading of the R30 between Virginia and Beatrix Mine.	Wetland and Biodiversity Specialist

Previous Experience

Client	Project Description	Role/ Responsibility
Miranda Minerals	**Sesikhona Colliery Wetland and Biodiversity Assessment** Undertaking the wetland and biodiversity specialist study in support of the Mining Right Application for the establishment of the Sesikhona Colliery, Dannhauser.	Wetland and Biodiversity Specialist
Miranda Minerals	**Uithoek Colliery Wetland and Biodiversity Assessment** Undertaking the wetland and biodiversity specialist study in support of the Mining Right Application for the establishment of the Uithoek Colliery, Dundee.	Wetland and Biodiversity Specialist
Miranda Minerals	**Burnside Colliery Wetland and Biodiversity Assessment** Undertaking the wetland and biodiversity specialist study in support of the Mining Right Application for the establishment of the Burnside Colliery, Dundee.	Wetland and Biodiversity Specialist
Ultimate Goal	**Ultimate Goal Colliery Biodiversity Assessment** Undertaking the wetland and biodiversity specialist study in support of the Mining Right Application for the establishment of the Ultimate Goal Colliery, Dundee.	Biodiversity Specialist
Canton Trading	**Taylors Halt Quarry Wetland and Biodiversity Assessment** Undertaking the wetland and biodiversity specialist study in support of the Mining Right Application for the establishment of the Taylor Halt Quarry, Pietermaritzburg.	Wetland and Biodiversity Specialist
South African National Roads Agency Limited	**uMtamvuna Quarry Biodiversity Assessment** Undertaking the biodiversity specialist study in support of the Mining Right Application for the establishment of the SANRAL Quarry, Kokstad.	Biodiversity Specialist

SACNASP

South African Council for Natural Scientific Professions

herewith certifies that

Magnus van Rooyen

Registration Number: 400335/11

is a registered scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)
in the following field(s) of practice (Schedule 1 of the Act)

Environmental Science (Professional Natural Scientist)

Effective **31 August 2011** Expires **31 March 2024**

Chairperson

Chief Executive Officer

To verify this certificate scan this code

APPENDIX B
FULL DWS RISK ASSESSMENT

PROJECT: **Ummbila Emoyeni Borr Pit**

RISK ASSESSMENT MATRIX for Section 21 (c) and (i) Water Use activities - Version 2.1

Name of Assessor: Magnus van Rooyen

SACNASP Registration Number: 400335/11

Date of assessment: Aug-24

Signature:

Risk to be scored for all relevant phases of the project (**factoring in specified control measures**). MUST BE COMPLETED BY SACNASP PROFESSIONAL MEMBER REGISTERED IN AN APPROPRIATE FIELD OF EXPERTISE.

No.	Phase	Activity	Impact	Potentially affected watercourses			Intensity of Impact on Resource Quality					Overall Intensity (max = 10)	Spatial scale (max = 5)	Duration (max = 5)	Severity (max = 20)	Importance rating (max = 5)	Consequence (max = 100)	Likelihood (Probability) of impact	Significance (max = 100)	Risk Rating
				Name/s	PES	Overall Watercourse Importance	Abiotic Habitat (Drivers)			Biota (Responses)										
							Hydrology	Water Quality	Geomorph	Vegetation	Fauna									
Pre-mitigation	Establishment and operational	Inadequate stormwater management form the borrow pit area	(1) The changes to the runoff from the areas subjected to the earthworks may impact on the hydrological driver of the aquatic features during the establishment period which could impact on the PES of the features. (2) The removal of vegetation as a result of the earthworks may result in increased levels of silt that is washed into the aquatic features which may impact on the biota in the features. (3) The excavations that are made to open the borrow pit may decrease the amount of runoff from the borrow pit area as the water will accumalate in the excavations. This will impact the hydrological driver of the features which may impact the PES of the features. (4) Higher sediment loads washing of the stockpiles within the borrow pit site may result in an impact on the water quality in the aquatic features which will result in an impact on the PES of these	Channelled Valley Bottom, Flood Plain, Seep and Watercourses	C	Moderate	2	2	2	2	2	**4**	3	2	**9**	**3**	**27**	40%	**10.8**	**L**
Post-mitigation				Channelled Valley Bottom, Flood Plain, Seep and Watercourses	C	Moderate	2	2	2	2	2	**4**	3	2	**9**	**3**	**27**	40%	**10.8**	**L**
Pre-mitigation		Risk of hydrocarbon (fuels and oils) contamination of the aquatic features by leaking plant and equipment that will be used for the earthworks and operation of the borrow pit.	Hydrocarbons are toxic to aquatic plants and animals and are readily spread by flowing water.	Channelled Valley Bottom, Flood Plain, Seep and Watercourses	C	Moderate	2	2	2	2	2	**4**	3	2	**9**	**3**	**27**	40%	**10.8**	**L**
Post-mitigation				Channelled Valley Bottom, Flood Plain, Seep and Watercourses	C	Moderate	2	2	2	2	2	**4**	3	2	**9**	**3**	**27**	40%	**10.8**	**L**
Pre-mitigation		Inadequate management of petrochemical storage facilities	Leakages and spillages from the planned petrochemical storage facility may result in the contamination of the existing water quality in the aquatic features	Channelled Valley Bottom, Flood Plain, Seep and Watercourses	C	Moderate	2	2	2	2	2	**4**	3	2	**9**	**3**	**27**	40%	**10.8**	**L**
Post-mitigation				Channelled Valley Bottom, Flood Plain, Seep and Watercourses	C	Moderate	2	2	2	2	2	**4**	3	2	**9**	**3**	**27**	40%	**10.8**	**L**
Pre-mitigation		Risk of contamination of the aquatic features by the on-site ablution facilities.	Spillage or leakage could impact on the water quality that moves through the aquatic features, which could decrease the PES of the features.	Channelled Valley Bottom, Flood Plain, Seep and Watercourses	C	Moderate	2	2	2	2	2	**4**	3	2	**9**	**3**	**27**	40%	**10.8**	**L**
Post-mitigation				Channelled Valley Bottom, Flood Plain, Seep and Watercourses	C	Moderate	2	2	2	2	2	**4**	3	2	**9**	**3**	**27**	40%	**10.8**	**L**
Pre-mitigation		Risk of increasing sediment loads within the aquatic features as a result of runoff from the material stockpiles within the borrow pit site.	Higher sediment loads could impact on the aquatic biodata in the aquatic features which can further reduce the PES of these features.	Channelled Valley Bottom, Flood Plain, Seep and Watercourses	C	Moderate	2	2	2	2	2	**4**	3	2	**9**	**3**	**27**	40%	**10.8**	**L**
Post-mitigation				Channelled Valley Bottom, Flood Plain, Seep and Watercourses	C	Moderate	2	2	2	2	2	**4**	3	2	**9**	**3**	**27**	40%	**10.8**	**L**

ACTIVITY(S)	POTENTIAL ENVIRONMENTAL IMPACT	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		Duration	Extent	Irreplaceable Loss	Severity	CONSEQUENCE	Probability	SIGNIFICANCE	+/-	RISK RATING (C x S)		Duration	Extent	Irreplaceable Loss	Severity	CONSEQUENCE	Probability	SIGNIFICANCE	+/-	RISK RATING (C x S)
CONSTRUCTION PHASE: PREFERRED ALTERNATIVE																				
Air Quality & Climate																				
Dust from construction activities	Dust fallout	2	1	0	1	3	2	6	-	L	Strict enforcement of speed limits on all site roads Routine water spraying of site roads and denuded/disturbed areas (more frequent spraying may be necessary during dry, windy conditions) Removal of vegetation only if necessary Revegetation of disturbed areas once construction activities are complete.	2	1	0	1	3	1	3	-	L
Wetland Impacts																				
Inadequate stormwater management from the borrow pit area	(1) The changes to the runoff from the areas subjected to the earthworks may impact on the hydrological driver of the aquatic features during the establishment period which could impact on the PES of the features. (2) The removal of vegetation as a result of the earthworks may result in increased levels of silt that is washed into the aquatic features which may impact on the biota in the features. (3) The excavations that are made to open the borrow pit may decrease the amount of runoff from the borrow pit area as the water will accumulate in the excavations. This will impact the hydrological driver of the features which may impact the PES of the features. (4) Higher sediment loads washing of the stockpiles within the borrow pit site may result in an impact on the water quality in the aquatic features which will result in an impact on the PES of these features.	3	2	1	2	12	2	24	-	L	A Stormwater Management Plan must be developed before the establishment of the borrow pit can commence. This management plan must make provision for the following key principles: (1) Diversion of all stormwater runoff from above (north) the borrow pit area around the borrow pit. (2) All stormwater that accumulates in the excavated areas within the borrow pit after rainfall events must be discharged in a controlled manner into the environment. The discharge must be controlled to ensure that the pre-development runoff does not exceed the post-development runoff. (3) Provision must be made for the capturing of any silt that may wash from the material stockpile areas to ensure that the silt is not released directly into the environment. (4) No uncontrolled stormwater runoff must be allowed to the south, east and west of the borrow pit area. (5) The stormwater management plan must be submitted for approval by the Seriti Green.	3	2	1	1	6	1	6		L
Risk of hydrocarbon (fuels and oils) contamination of the aquatic features by leaking plant and equipment that will be used for the earthworks and operation of the borrow pit.	Hydrocarbons are toxic to aquatic plants and animals and are readily spread by flowing water.	3	2	1	2	12	2	24	-	L	(1) All plant and equipment that will be used in the construction activities must be inspected on a regular basis to ensure that any leaks are detected as soon as possible. (2) Any leaking plant and equipment must be removed from the construction site and only be allowed to return when the leaks have been addressed. (3) A Spill Contingency Plan must be in place for the duration of the construction phase that details the steps that needs to be taken if spills of various sizes are to occur. (4) No plant or equipment will be allowed to be parked overnight within a 40m buffer from the delineated edge of any aquatic feature.	3	2	1	1	6	1	6		L

Storage of hydrocarbons on site, and the inadequate management of petrochemical storage facilities will pose a risk.	Leakages and spillages from the planned petrochemical storage facility may result in the contamination of the existing water quality in the aquatic features	3	2	1	2	12	2	24	-	L	(1) In the event that any hydrocarbon materials are to be stored within the site during the operational phase, provision must be made that the storage facility is fully bunded in a bund that has a volume of 110% of the total volume of hydrocarbons that are stored. (2) The bund must be provided with a closable drainage tap for use when fluid needs to be drained from the bund. (3) The hydrocarbon storage facility may not be located within the 35m buffer from the delineated edge of any aquatic feature. If the edge is not known during the establishment of the storage feature, this must be delineated by an aquatic specialist before implementation. (4) A Spill Contingency Plan must be in place for the construction phase that details the management and mitigation actions that needs to be undertaken in the event of any spillages from the hydrocarbon storage facility.	3	2	1	1	6	1	6		L
Soils, Land Capability and Land Use																				
Movement of machinery, land preparation and excavations and other construction activities.	Soil Compaction and Erosion	1	1	0	1	2	2	4	-	L	Any recommendations provided by a storm water management plan must be adhered too. Measures must be put in place to attenuate water from the infrastructure and mining site and reduce runoff. Attenuation measures such as terracing should be incorporated to reduce the velocity of run-off water which may create soil erosion. All stockpiles created from the construction activities must be protected from erosion, stored on flat areas, where runoff will be minimised. Stockpiles must also only be stored for the minimum amount of time necessary. Should contaminants enter the soil profile due to spillages or other unforeseen circumstances a rehabilitation/spill specialist must be consulted regarding implementation of suitable mitigation and/or rehabilitation measures.	1	1	0	1	2	1	2	-	L
Movement of machinery, land preparation and excavations and other construction activities.	Soil Pollution Potential	1	2	0	2	6	2	12	-	L	Vehicles are to be maintained in good working order so as to reduce the probability of leakage of fuels and lubricants. A dedicated store with adequate flooring or bermed area must be used to accommodate chemicals such as fuel, oil, paint etc. Concrete is to be mixed on mixing trays only, not on exposed soil. Concrete and tar must be mixed only in areas which have been specially demarcated for this purpose. After all the concrete / tar mixing is complete all waste concrete / tar must be removed from the batching area and disposed of at an approved dumpsite. The Environmental Management Plan must be implemented to ensure that all waste and pollutants are handled, stored, and disposed of correctly.	1	1	0	1	2	1	2	-	L
Terrestrial Biodiversity Impacts																				
Potential increase in alien vegetation	The occurrence of alien invasive vegetation on the study site is relatively low, however, any disturbance of the current vegetation will create and opportunity for alien species to settle on the study site. If these alien species settle on the study site, the site might become an area from which these species can proliferate into the surrounding areas.	2	2	0	2	8	2	16	-	L	An Alien Invasive Species Management Plan must be implemented for the duration of the operation and decommissioning of the borrow pit. The plan must include, as a minimum, measures for: • Scheduled monitoring of the site for the establishment of alien species; • Identification of alien species that do settle on the site; and • Identification and implementation of species appropriate alien invasive species management measures.	2	1	0	1	3	1	3	-	L
Loss of indigenous vegetation	The vegetation on the project site contains transformed indigenous grass land which will be removed during the establishment and operation of the borrow pit. This will lead to a reduction in the indigenous vegetation on the site.	3	2	0	2	10	2	20	-	L	Provision must be made in the Rehabilitation Plan for the borrow pit area for the following: • Collection and conservation of topsoil; • Grass species identification before removal to ensure that appropriate species are used in the re-vegetation; and • Continuous rehabilitation of the mined out areas within the borrow pit if appropriate.	1	3	0	1	4	1	4	-	L

Contamination of the area by petrochemical spillages	The presence of plant and equipment on the borrow pit site that make use of petrochemical substances to operation pose a risk of contamination soils on the project site which could result in the contamination of the groundwater on the site.	3	2	0	2	10	2	20	-	L	The following management and mitigation measures must be included into the Environmental Management Programme for the project: •All plant and equipment that make use of petrochemical substances must be checked leakages on a daily basis before operations commence. •All plant and equipment that are found to be leaking must be removed from the property and only returned once the leakages have been addressed. •If any petrochemical substances are stored on the property, this storage must be done on an impermeable surface in a bunded area that makes provision for 110% of volume of the substances that are stored. •All refuelling of plant and equipment must be conducted over a drip-tray. •If any plant or equipment is to be parked on the site, these must be parked within the demarcated borrow pit footprint that has been cleared. •If any spillages from plant or equipment occur, the spill must be immediately contained, the contaminated soils must be collected and bagged in impermeable bags and stored on site to be removed and disposed of by a registered service provider.	1	1	0	1	2	1	2	-	L
Establishment of the borrow pit area will generate waste materials associated with the establishment phase.	It is not clear if any structures (site office, storage area, etc) within the borrow pit area, however, if such structures are to be erected, waste material will be generated that will pose a risk to the terrestrial environment if not managed appropriately.	1	1	0	2	4	2	8	-	L	The following waste management activities must be provided for in the Environmental Management Programme for the project: •A skip must be made available on-site into which all construction waste can be discarded. •All construction waste must be cleared from the site on a daily basis and placed in these skip. •The capacity of the skip must be monitored on a daily basis to ensure that a replacement skip can be arranged on the same day as the filled skip is removed. •The disposal of the content of the skip must be done at a municipal landfill site. •No dumping of construction waste on open areas on the borrow pit site will be allowed. •No burial of construction waste within the borrow pit site or in the surrounding areas will	1	1	0	1	2	1	2	-	L
Contamination of the area by domestic waste.	The presence of a labour force associated with the establishment of the borrow pit will generate an amount of domestic waste (food wrapping, plastic bottles, etc.) on the site.	1	1	0	2	4	2	8	-	L	The following waste management activities must be provided for in the Environmental Management Programme for the project: •A designated eating area must be established within the borrow pit site. •Covered domestic waste bins must be present at the eating area to receive all the domestic waste generated by the labour. •The capacity of these domestic waste bins must be monitored on a daily basis to ensure that they are emptied timeously. •The domestic waste from these waste bins must be removed off site and disposed of at a municipal landfill site on a weekly basis or more regularly if the bins fill up quicker.	1	1	0	1	2	1	2	-	L
Contamination of the area as a result of leaking portable toilet facilities.	Portable toilet facilities will be present of the property to service the labour associated with the establishment of the borrow pit. These toilets will pose a risk of leakages and spillages which may impact on the groundwater and surface water quality as well as the surrounding terrestrial ecology if not managed adequately.	2	2	0	3	12	2	24	-	L	The following management and mitigation measures must be included into the Environmental Management Programme Report for the project: •Only portable chemical toilets with a sealed reservoir will be allowed on site. •The capacity of the reservoirs in the portable chemical toilets must be monitored on a daily basis to ensure that they can be serviced timeously. •All removal of the collected sewage waste from the portable chemical toilets must be conducted by a registered service provider for disposal at a municipal wastewater treatment facility.	2	1	0	2	6	1	6	-	L
Socio-Economic Impacts																				
Workforce, equipment hire, generators and other services and purchases	Job creation	1	1	0	2	4	1	4	+	L	Procurement process to be followed to include local workforce/ companies to get employment during construction.	1	1	0	2	4	4	16	-	L
Visual Impacts																				
Construction Machinery and Vehicles on site	Visual impact on surrounding Receptors	1	2	0	2	6	1	6	-	L	Do not let vehicles run when not is use.	1	2	0	2	6	1	6	-	L
Dust from construction activities	Creating visual impact for passing traffic.	1	2	0	2	6	1	6	-	L	Spray areas with water when the climate is dry and dust starts to emanate from the site.	1	2	0	2	6	1	6	-	L
Noise Impacts																				

Construction and Machinery		1	2	0	2	6	1	6		L	Ensure that construction vehicles are serviced regularly. Machinery should not be running when not in use. Construction to take place within operating hours.	1	2	0	2	6	1	6	-	L
Movement of construction Vehicles		1	2	0	2	6	1	6		L	Adhere to speed restrictions. Stay on demarcated roads.	1	2	0	2	6	1	6	-	L
Cultural Heritage & Paleontological Impacts																				
Excavations and Construction	Heritage and Palaeontological Impact	1	1	1	2	6	1	6	-	L	Should any human remains be unearthed by construction activities, the South African Police Services (SAPS) and the heritage consultant must be contacted immediately. The Environmental Control Officer (ECO) appointed for the project must ensure that the appointed contractor, and construction staff are made aware that should any graves, or other heritage features be discovered during vegetation clearing or excavations, all activity within the vicinity of the discovery must cease immediately, and the ECO must be	1	1	1	2	6	1	6	-	L

ACTIVITY(S)	POTENTIAL ENVIRONMENTAL IMPACT	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		Duration	Extent	Irreplaceable Loss	Severity	CONSEQUENCE	Probability	SIGNIFICANCE	+/-	RISK RATING (C x S)		Duration	Extent	Irreplaceable Loss	Severity	CONSEQUENCE	Probability	SIGNIFICANCE	+/-	RISK RATING (C x S)
OPERATIONAL PHASE: PREFERRED ALTERNATIVE																				
Air Quality																				
Dust from mining activities	Dust fallout	2	1	0	1	3	2	6	-	L	Strict enforcement of speed limits on all site roads Routine water spraying of site roads, office area and denuded/disturbed areas (more frequent spraying may be necessary during dry, windy conditions) Removal of vegetation only if necessary Revegetation of disturbed areas once mining activities are complete.	2	1	0	1	3	1	3	-	L
Wetland Impacts																				
Inadequate stormwater management from the borrow pit area	(1) The changes to the runoff from the areas subjected to the earthworks may impact on the hydrological driver of the aquatic features during the establishment period which could impact on the PES of the features. (2) The removal of vegetation as a result of the earthworks may result in increased levels of silt that is washed into the aquatic features which may impact on the biota in the features. (3) The excavations that are made to open the borrow pit may decrease the amount of runoff from the borrow pit area as the water will accumulate in the excavations. This will impact the hydrological driver of the features which may impact the PES of the features. (4) Higher sediment loads washing of the stockpiles within the borrow pit site may result in an impact on the water quality in the aquatic features which will result in an impact on the PES of these features.	3	2	1	2	12	2	24	-	L	A Stormwater Management Plan must be developed before the establishment of the borrow pit can commence. This management plan must make provision for the following key principles: (1) Diversion of all stormwater runoff from above (north) the borrow pit area around the borrow pit. (2) All stormwater that accumulates in the excavated areas within the borrow pit after rainfall events must be discharged in a controlled manner into the environment. The discharge must be controlled to ensure that the pre-development runoff does not exceed the post-development runoff. (3) Provision must be made for the capturing of any silt that may wash from the material stockpile areas to ensure that the silt is not released directly into the environment. (4) No uncontrolled stormwater runoff must be allowed to the south, east and west of the borrow pit area. (5) The stormwater management plan must be submitted for approval by the Seriti Green.	3	2	1	1	6	1	6		L
Risk of hydrocarbon (fuels and oils) contamination of the aquatic features by leaking plant and equipment that will be used for the earthworks and operation of the borrow pit.	Hydrocarbons are toxic to aquatic plants and animals and are readily spread by flowing water.	3	2	1	2	12	2	24	-	L	(1) All plant and equipment that will be used in the construction activities must be inspected on a regular basis to ensure that any leaks are detected as soon as possible. (2) Any leaking plant and equipment must be removed from the construction site and only be allowed to return when the leaks have been addressed. (3) A Spill Contingency Plan must be in place for the duration of the construction phase that details the steps that needs to be taken if spills of various sizes are to occur. (4) No plant or equipment will be allowed to be parked overnight within a 40m buffer from the delineated edge of any aquatic feature.	3	2	1	1	6	1	6		L

Storage of hydrocarbons on site, and the inadequate management of petrochemical storage facilities will pose a risk.	Leakages and spillages from the planned petrochemical storage facility may result in the contamination of the existing water quality in the aquatic features	3	2	1	2	12	2	24	-	L	(1) In the event that any hydrocarbon materials are to be stored within the site during the operational phase, provision must be made that the storage facility is fully bunded in a bund that has a volume of 110% of the total volume of hydrocarbons that are stored. (2) The bund must be provided with a closable drainage tap for use when fluid needs to be drained from the bund. (3) The hydrocarbon storage facility may not be located within the 35m buffer from the delineated edge of any aquatic feature. If the edge is not known during the establishment of the storage feature, this must be delineated by an aquatic specialist before implementation. (4) A Spill Contingency Plan must be in place for the construction phase that details the management and mitigation actions that needs to be undertaken in the event of any spillages from the hydrocarbon storage facility.	3	2	1	1	6	1	6		L
Soils, Land Capability and Land Use																				
Movement and operation of vehicles and machinery/equipment	**Soil Contamination**	5	1	0	2	12	2	24	-	L	• Restrict vehicles to travel only on designated roadways • Ensure vehicles are in good condition and not leaking fuel or oil when entering the site • All plant and equipment that make use of petrochemical substances must be checked leakages on a daily basis before operations commence. • Maintenance to be done in suitably designed and designated areas • All plant and equipment that are found to be leaking must be removed and only returned once the leakages have been addressed. • All refuelling of plant and equipment must be conducted over a drip-tray or designated bunded areas. • If any plant or equipment is to be parked on the site, these must be parked within a demarcated and dedicated area which is appropriately protected (e.g. impermeable surface oil & silt traps, etc.). • Storage of hazardous substances must be done on an impermeable surface, protected from the elements, in a bunded area that makes provision for 110% of the volume of the substances containers that are stored. • The bunded area must consist of an impermeable floor, a sump, an oil trap as well as walls and be fitted with a valve that can be used to drain any spillages for appropriate disposal at a licensed facility. Release of effluent from these areas into the surrounding environment is strictly prohibited. • Suitable spill prevention measures to be in place and spills should be cleaned up on occurrence. • An integrated waste management approach, taking cognisance of the waste management hierarchy and other proposed mitigation measures, must be developed and implemented, including but not limited to the following aspects: - Skips must be made available on-site as and where required. - The capacity of these skips must be monitored on a daily basis to ensure that a replacement skip can be arranged on the same day as the filled skips are removed. - The disposal of the content of these skips must be done at a licensed landfill site. - No dumping, burning or burial of waste is allowed within the operation's site or in the surrounding areas. - Implement a waste management plan and monitor levels of litter constantly.	5	1	0	1	6	1	6	-	L
Storage of general and hazardous waste and substances		5	1	0	2	12	2	24	-	L		5	1	0	1	6	1	6	-	L
Maintenance activities		5	1	0	2	12	2	24	-	L		5	1	0	1	6	1	6	-	L
Operation of the generator.	Continued Soil Compaction and Erosion	5	1	0	2	12	1	12	-	L	▪ Any recommendations provided by a storm water management plan must be adhered too. ▪ Should contaminants enter the soil profile due to spillages or other unforeseen circumstances a rehabilitation/spill specialist must be consulted regarding implementation of suitable mitigation and/or rehabilitation measures. ▪ Vehicles are to be maintained in good working order so as to reduce the probability of leakage of fuels and lubricants. ▪ A dedicated store with adequate concrete flooring or bermed area must be used to accommodate chemicals such as fuel, oil, paint etc. ▪ An Environmental Management Plan must be implemented to ensure that all waste and pollutants are handled, stored, and disposed of correctly.	5	1	0	1	6	1	6	-	L
Operation of the generator.	Continued Soil Pollution Potential	5	2	0	2	14	2	28	-	M		5	1	0	1	6	2	12	-	L
Terrestrial Biodiversity Impacts																				

Spreading of alien invasive vegetation	The occurrence of alien invasive vegetation on the project site is relatively low, however, any disturbance of the current vegetation will create and opportunity for alien species to settle on the study site. If these alien species settle on the project site, the site might become an area from which these species can proliferate into the surrounding	2	2	0	2	8	2	16	-	L	An Alien Invasive Species Management Plan must be implemented for the duration of the operation and decommissioning of the borrow pit. The plan must include, as a minimum, measures for: • Scheduled monitoring of the site for the establishment of alien species; • Identification of alien species that do settle on the site; and • Identification and implementation of species appropriate alien invasive species management measures.	2	1	0	1	3	1	3	-	L
Contamination by domestic waste generated by the operations	Domestic waste will be generated by the employees associated with the borrow pit.	1	1	0	2	4	2	8	-	L	The following waste management activities must be provided for in the Environmental Management Programme for the project: • A designated eating area must be established within the project site. • Covered domestic waste bins must be present at the eating area to receive all the domestic waste generated by the employees. • The capacity of these domestic waste bins must be monitored on a daily basis to ensure that they are emptied timeously. • The domestic waste from these waste bins must be removed off site and disposed of at a municipal landfill site on a weekly basis or more regularly if the bins fill up quicker.	1	1	0	1	2	1	2	-	L
Contamination by leaking sewage from operations ablutions facilities.	Portable toilet facilities will be present of the property to service the labour associated with the operations of the borrow pit. These toilets will pose a risk of leakages and spillages which may impact on the groundwater and surface water quality as well as the surrounding terrestrial ecology if not managed adequately.	2	2	0	3	12	2	24	-	L	The following management and mitigation measures must be included into the Environmental Management Programme Report for the project: • Only portable chemical toilets with a sealed reservoir will be allowed on site. • The capacity of the reservoirs in the portable chemical toilets must be monitored on a daily basis to ensure that they can be serviced timeously. • All removal of the collected sewage waste from the portable chemical toilets must be conducted by a registered service provider for disposal at a municipal wastewater treatment facility.	2	2	0	3	12	1	12	-	L
Contamination of the area by petrochemical spillages	The presence of plant and equipment on the borrow pit site that make use of petrochemical substances to operation pose a risk of contamination soils on the project site which could result in the contamination of the groundwater on the site.	3	2	0	3	15	2	30	-	M	The following management and mitigation measures must be included into the Environmental Management Programme for the project: • All plant and equipment that make use of petrochemical substances must be checked leakages on a daily basis before operations commence. • All plant and equipment that are found to be leaking must be removed from the property and only returned once the leakages have been addressed. • If any petrochemical substances are stored on the property, this storage must be done on an impermeable surface in a bunded area that makes provision for 110% of volume of the substances that are stored. • All refuelling of plant and equipment must be conducted over a drip-tray. • If any plant or equipment is to be parked on the site, these must be parked within the demarcated borrow pit footprint that has been cleared. • If any spillages from plant or equipment occur, the spill must be immediately contained, the contaminated soils must be collected and bagged in impermeable bags and stored on site to be removed and disposed of by a registered service provider.	1	1	0	1	2	1	2	-	L
Socio-Economic Impacts																				
Employment and services.	Continuous operations	5	2	0	1	7	1	7	+	L	Procurement process to be followed to include local workforce/ companies to get employment during operation.	5	2	0	1	7	1	7	+	L
Visual Impacts																				
Emissions from the generator and vehicles and mining activities	Visible emissions disturbing surrounding areas.	5	2	0	1	7	2	14	-	L	Spray areas with water when the climate is dry and dust starts to emanate from the site. Do visual inspection when irregular emissions occur.	5	2	0	1	7	1	7	-	L
Noise Impacts																				
Operating Generator	Noise	5	2	0	2	14	2	28	-	M	Make use of available technology and protection to reduce the noise from eh generator.	5	2	0	1	7	1	7	-	L
Operating Heavy Machinery	Noise	5	2	0	3	21	2	42	-	M	Make use of available technology and protection to reduce the noise from the machinery. Workers should wear ear protection.	5	2	0	1	7	2	14	-	L