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DRAFT BASIC ASSESSMENT REPORT

DC26/0009/2021: KZN/EIA/0001610/2021

The Proposed Expansion of Amandla Power Agri Piggery within Jachtdrift Farm, in Ward 7 of Edumbe Local Municipality, Kwa-Zulu Natal.

SEPTEMBER

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Prepared for:

Amandla Power Agri (Pty) Ltd.



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Overview: Assessment of impacts related to the proposed expansion of Amandla Power Agri Piggery, in order to ensure the Client's compliance with all relevant environmental legislations.

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LIST OF ACRONYMS

BAR	Basic Assessment Report
CFP	Chance Finds Procedure
DWS	Department of Water and Sanitation
DEDTEA	Department of Economic Development, Tourism and Environmental Affairs
DOT	Department of Transport
EMPr.	Environmental Management Programme
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
HGM	Hydrogeomorphic
MSDS	Material Safety Data Sheet
NEMA	National Environmental Management Act 107 (Act 107 of 1998)
NEMPAA	National Environmental Management: Protected Areas, 2003 (Act 57 of 2003)
I&AP	Interested and Affected Parties
EAP	Environmental Assessment Practitioner
GA	General Authorisation
SCADA	Supervisory Control and Data Acquisition
SCC	Species of Conservation Concern

GLOSSARY OF ITEMS

DEVELOPMENT: the building, erection or establishment of a facility, structure or infrastructure that is necessary for the undertaking of a listed or specified activity, but excludes any modification, alteration or expansion of such a facility, structure or infrastructure and excluding the reconstruction of the same facility in the same location, with the same capacity and footprint.

BIODIVERSITY: The variety of life in an area, including the number of different species, the genetic wealth within each species, and the natural areas where they are found.

BASIC ASSESSMENT: The process of collecting, organizing, analyzing, interpreting and communicating information that is relevant to the consideration of the application, in terms of Listing Notice 1 (GNR 327 and 324 of 2017) of NEMA (as amended).

DEVELOPMENT FOOTPRINT: any evidence of physical alteration because of the undertaking of an activity.

CONTRACTOR: companies and or individual persons appointed on behalf of the client to undertake activities, as well as their sub-contractors and suppliers.

ENVIRONMENTAL CONTROL OFFICER (ECO): an individual nominated through the client to be present on-site to act on behalf of the client in matters concerning the implementation and day to day monitoring of the EMPr and conditions stipulated by the authorities as prescribed in NEMA.

ENVIRONMENT: in terms of the NEMA (as amended), the “environment” means the surroundings within which humans exist and that are made up of: the land, water, and atmosphere of the earth; micro-organisms, plant and animal life; any part or combination of (i) of (ii) and the interrelationships among and between them; the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.

ENVIRONMENTAL IMPACT: the change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization’s activities, products or services.

HYDROLOGICAL SYSTEM: water bodies and their connectivity to the welfare of an ecosystem.

MITIGATION: the measures designed to avoid reduce or remedy adverse impacts.

ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr): a detailed plan of action prepared to ensure that recommendations for enhancing or ensuring positive environmental impacts and limiting or preventing negative environmental impacts are implemented during the lifecycle of the project. This EMPr focuses on the construction phase, operation (maintenance) phase and decommissioning phase of the proposed project.

POLLUTION: NEMA defines pollution to mean any change in the environment caused by the substances; radioactive or other waves; or noise, odours, dust or heat emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people or will have such an effect in the future.

WATER POLLUTION: the National Water Act, 1998 (Act 36 of 1998) defines water pollution to be the direct or indirect alteration of the physical, chemical or biological properties of a water resource so as to make it less fit for any beneficial purpose for which it may reasonably be expected to be used; or harmful or potentially harmful (a) to the welfare, health or safety of human beings; (b) to any aquatic or non-aquatic organisms; (c) to the resource quality, or (d) to property.

REHABILITATION: rehabilitation is defined as the return of a disturbed area to a state which approximates the state (wherever possible) which it was before the disruption.

WATERCOURSE: can be a) a river or spring; b) a natural channel or depression in which water flows regularly or intermittently; c) a wetland, lake or dam into which, or from which, water flows; and/or 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, 1998 (Act No. 36 of 1998) and a reference to a watercourse includes, where relevant, its bed and banks.

WETLAND: the 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.

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.

GENERAL WASTE: waste that does not pose an immediate hazard or threat to health or the environment, and includes domestic waste; building and demolition waste; business waste; and inert waste.

HAZARDOUS WASTE: hazardous waste means any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment.

ARCHAEOLOGICAL RESOURCES: includes (a) material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years including artifacts, human and hominid remains and artificial features and structures; (b) rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10m of such representation; wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the republic as defined in the Maritimes Zones Act, 1994 (Act 15 of 1994), and any cargo, debris or artifacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation; features, structures and artifacts associated with military history which are older than 75 years and the site on which they are found.

INTERESTED AND AFFECTED PARTY (I&AP): for the purposes of Chapter 5 of the NEMA and in relation to the assessment of the environmental impact of a listed activity or related activity, an interested and affected party contemplated in Section 24(4) (a) (v), and which includes (a) any person, group of persons or organization interested in or affected by such operation or activity; and (b) any organ of state that may have jurisdiction over any aspect of the operation or activity.

EXECUTIVE SUMMARY

The Amandla Power Agri Piggery Farm proposes to expand the piggery and build a slurry sump within Jachtdrift Farm in Paulpietersburg, KwaZulu-Natal. Therefore, Emvelo Quality and Environmental Consultant has been appointed by Amandla Power Agri (Pty) Ltd (the applicant), as the independent Environmental Assessment Practitioner (EAP), to facilitate the Basic Assessment Processes required in terms of the National Environmental Management Act (NEMA, Act 107 of 1998) for this application. This application will follow a Basic Assessment. The listed activity associated with the proposed development is Listing Notice 1, Activity 39.

The current piggery houses 17 sows and 53 growers. This makes the total of 70 pigs excluding weaners (piglets). As a result, the farmer proposed to add 50 sows and 2 (two) boars to an existing stock. Given, the addition of 50 sows and 2 (two) boars, the Amandla Power Agri will be estimated to have 500 pigs or more with inclusion of growers. Therefore, the farm will exceed the threshold of 250 pigs. Therefore, to complement this farming operation the farmer will add 8 (eight) more pigsty of (42mx10m) each. Also, build 90m³ slurry sump to temporary store the slurry from the pigsties.

The Public Participation Process (PPP) has, to date, included: displaying onsite notices, placing of an advertisement in the Ilanga Newspaper (isiZulu newspaper), distribution of Background Information Documents (BIDs), and public meeting with focus group, as well as the circulation of the draft Basic Assessment Report (BAR) to the relevant Interested and Affected Parties (I&APs).

The 'Alternative A: Site Layout Alternative' will have minimal environmental degradation that might be expected, as there will be a minimum disturbance as expansion for piggery will be within the farm property, which is already transformed. Also, after consideration of bio-physical and social environmental aspects, the 'Alternative B: Design Alternative' in line with a 'Site Layout Design' discussed above, is considered the most preferred alternatives for the proposed expansion of Amandla Power Agri Piggery. The design will involve housing the 500 pigs in adequate facilities (additional eight pigsties) of 42mx10m each, to reduce the concentration. Also, the drainage system for flushing of slurry into 90m³ slurry sump. The summary of impacts significant during construction and operation/maintenance phase are outlined by (**Table 1**) below.

Table 1: Summarised Impacts Significance

Impact	Construction Phase		Operational Phase	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Erosion due to uncontrolled construction activities such as, clearing of vegetation, topsoil removal, degradation within the farm vicinity	Medium	Negligible	Negligible	Negligible
Solid waste during construction and operation	Medium-High	Negligible	High	Negligible
Effluent waste during construction, and effluent waste during operation (accumulation of effluent, such as slurry within the piggery facilities and farm vicinity)	Negligible	Negligible	High	Very-Low
Nuisance, environmental health and ambient odour	Negligible	Negligible	High	Very-Low
Alien invasive plant introductions through construction activities	Medium	Negligible	Medium	Negligible

The EAP submit that the environmental process undertaken thus far complies with these requirements and that this report covers the full suite of potential environmental issues related to the proposed expansion of Amandla Power Agri Piggery. All potential impacts have been evaluated and responded to by either complete avoidance where possible, or by recommendation of the most appropriate and feasible mitigation measures. The preferred/mitigated development proposal presented in this report is responsive to the integrated results of the assessment of potential impacts made by the various specialists on the project team.

1 INTRODUCTION

Emvelo Quality and Environmental Consultant has been appointed by Amandla Power Agri (Pty) Ltd, to undertake an Environmental Impact Assessment (EIA) for the proposed expansion of the piggery and the construction of a slurry sump within Jachtdrift Farm in Paulpietersburg, KwaZulu-Natal. This will include the facilitation of the Basic Assessment Processes as required in terms of the NEMA for this application.

2 PROJECT TITLE

The Propose Expansion of Amandla Power Agri Piggery Within Jachtdrift Farm, in Ward 7 of eDumbe Local Municipality, Kwazulu-Natal.

3 PROJECT DESCRIPTION

The Amandla Power Agri Piggery Farm proposes to expand the piggery and build a slurry sump within Jachtdrift Farm in Paulpietersburg, KwaZulu-Natal.

The existing piggery houses 17 sows and 53 growers. This makes the total of 70 pigs excluding weaners (piglets). The farmer therefore, propose to add 50 sows and two (2) boars to an existing stock. Given, the addition of 50 sows and two (2) boars, the Amandla Power Agri piggery will be estimated to have 500 pigs or more with inclusion of growers. As a result of expansion, the farm will exceed the threshold of 250 pigs.

Currently the farm has three (3) pigsties: One (1) currently in use is (39mX10m) in size; Two (2) existing pigsties not in use are sized (25mX8m) and (26mX8m). Therefore, to complement this farming operation the farmer will add eight (8) more pigsty of (42Mx10) each in size. Also, build 90m³ slurry sump to temporary store the slurry from the pigsties. Other existing farm infrastructure are: Farmworkers' house; Back-up Generator; Borehole and two (2) elevated jojo tanks, each with a capacity of 2500L. The proposed expansion footprint is 0.4ha within a 5.1ha farm property.

The environmentally friendly disinfectant (Virogon disinfectant) will be used to disinfect the pigsties. The pigsties slurry will be controlled by flushing of the drainage system at every two

weeks interval, and flushed out to a slurry sump. The pigsty slurry will be channelled to a 90m³ slurry sump for temporal storage, will then be emptied by the honey sucker (service provider) and distributed to local crop farmers. Therefore, the slurry is regarded as a by-product for piggery operation.

4 PROJECT LOCALITY

The project locality is described in terms of geographic locational context and site context, as explained in (**Section 4.1 & 4.2**) below.

4.1 Geographical Locational Context

The study area falls within the jurisdiction of eDumbe Local Municipality (ELM) situated within Zululand District Municipality (UDM), KwaZulu-Natal, at approximately 30km north-east of Vryheid and approximately 21km south-east of Paulpietersburg (**Figure 1**).

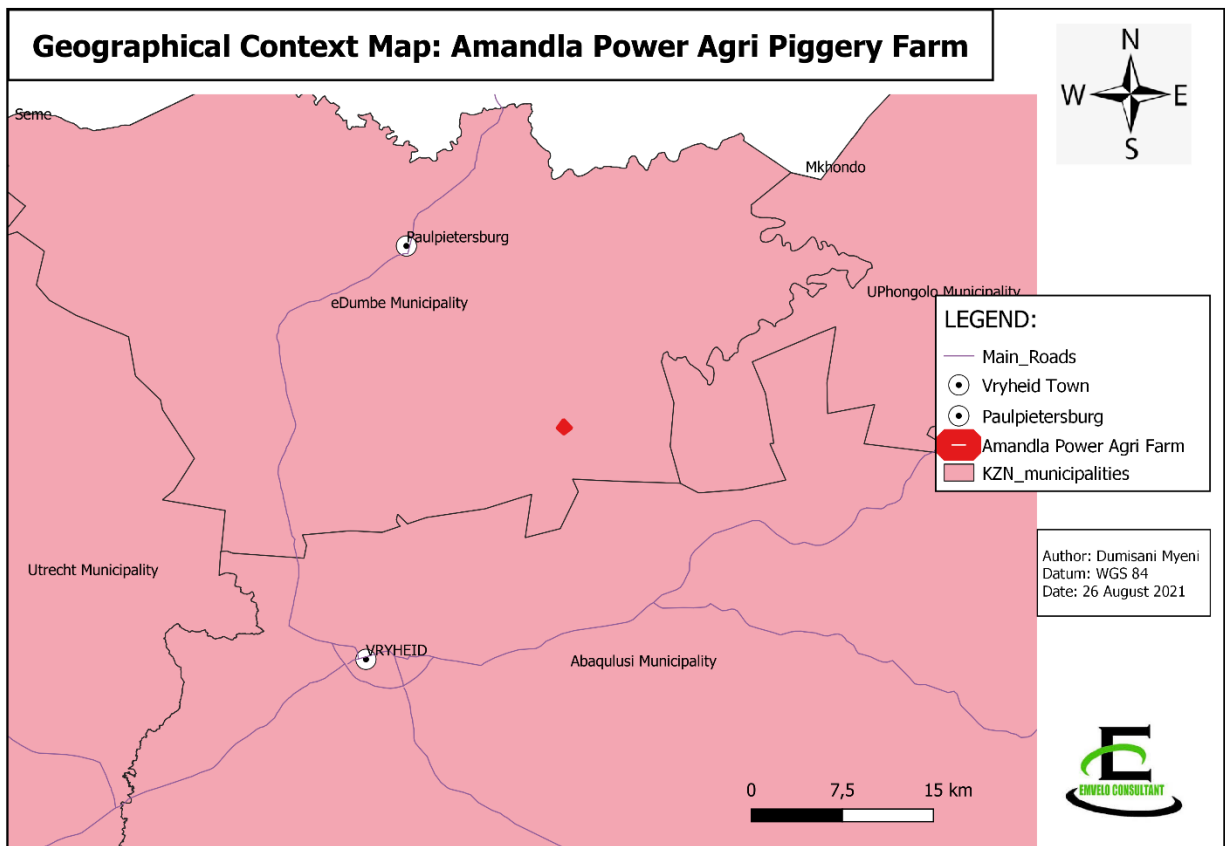


Figure 1: Geographical Context for expansion of Amandla Power Agri Piggery

4.2 Site Locality Context

The site is located within Jachtdrift Farm (Mahloni farm), ERF no: 524, portion 0 and 4. Located along L2337 road, Paulpietersburg within eDumbe Local Municipality (**Figure 2**).

The locality of the study area is currently zoned agricultural and has been historically utilised as an agricultural farm by the Applicant, therefore it will not require a change of land use. The surrounding land use is agricultural (classified as crops and ranch lands) and comprises of other farm dwellings.

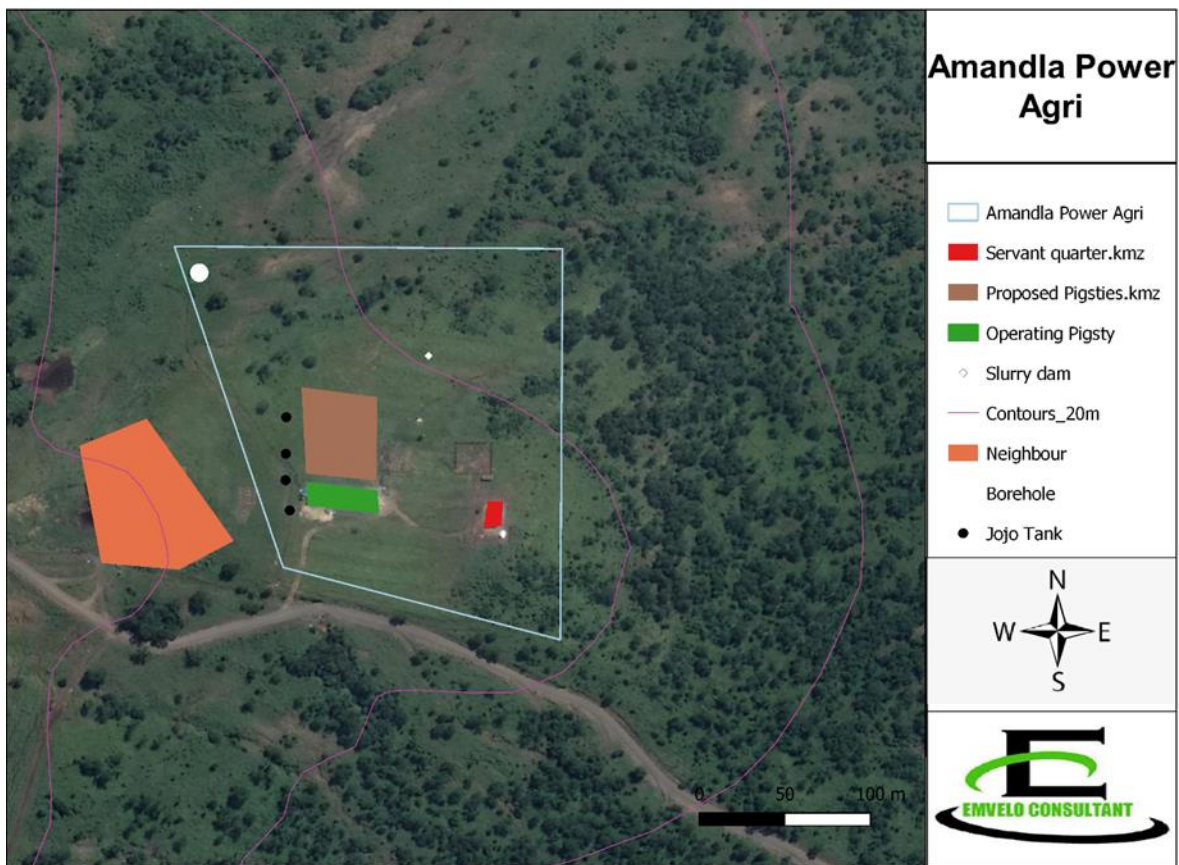


Figure 2: Locality map depicting a site layout

The (**Table 2**) below, provides the Global Positioning System (GPS) co-ordinates for the proposed development site.

Table 2: Site Activities Co-ordinates

Latitude /Longitude	Degrees	Minutes	Seconds
Within the Farm			
South	27°	34'	31.2''
East	30°	57'	04.8''

The (**Table 3**) below, provides the 21-digits Surveyor General Code (SGC)

Table 3: 21-digits Surveyor General Code

N	0	H	T	0	0	0	0	0	0	0	0	0	5	2	4	0	0	0	0
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

5 SITE ACCESS

Amandla Power Agri Piggery Farm is located about 21km south-east of Paulpietersburg town. From Paulpietersburg town on Hoog St, head south and continue, in 16 km turn left and continue straight and turn right on splitting road. In 3.1 km turn left on a splitting road, after 4.5 km drive turn right on L2337 road and in about 815 m the Mandla Power Agri Piggery Farm would have been reached.

6 ACTIVITY MOTIVATION

The Amandla Power Agri (Pty) Ltd has venture into pork industry, as a result of growing market demand this prompted the business to expand it operation in order to maximize the production to meet its current market demand. As a result, the Mandla Power Agri proposes to expand its piggery to produce approximately 500 porkers within a production cycle to supply the pork market.

6.1 The need

Currently, Amandla Power Piggery does not have a sustainable production cycle as the piggery does not produce enough product (porkers) to sustain their current market which they supply. As a result, this left them in uncertainty as their customers require the sustainable supply.

In line with the Kwa-Zulu Natal Provincial Growth and Development Strategy (2011), District Growth and Development Planning policy and National Development Plan 2030, the agriculture industry not only provide food security but also a major employer and contributor to the GDP. Therefore, in totality the growth of Amandla Power Agri Piggery like other businesses will have an economic multiplier effect through job creation and other suppliers and service provider servicing the industry.

As mentioned above (**Section 6**) the Amandla Power is required to expand it piggery to meet their market demand. Therefore, based on the above-mentioned factors, the proposed development is needed by the applicant (Amandla Power Agri).

6.2 Desirability

The propose expansion of Amandla Power Agri piggery will increase the production cycle, grow the business, meet the market demand and grow the local economy (local suppliers) and through jobs creation.

Furthermore, it is also noted that the site is situated within a rural municipality with community faced with high unemployment. Therefore, the inclusion of local labour during the construction period will create the much-needed temporary employment opportunities and transfer of skills, also permanent jobs during operational phase.

7 DESIGN CRITERIA

The facility design of the proposed expansion of Amandla Power Agri piggery to accommodate approximately 500 pigs is outlined in (**Table 4**) below:

Table 4: Design criteria for Expansion of Amandla Power Agri Piggery

Design parameter	Measurement
Unit size	420m ²
No. of Facilities	8

Total size of facilities	3 360m ²
Facilitate types	50 Sows Unit: Boar and Dry Sows 50 Sow Unit: Farrowing and Weaners 50 Sow Unit: Growers
Flooring and partition	Weaners: PVC flooring and fibre support beams Farrowing: PVC , Cast iron slats and support beams Boar and Dry Sows: Concrete slat Growers: Concrete slat
Drainage system (Flush Pipes)	250mm diameter
Slurry sump storage capacity	90m ³
Slurry sum dimensions	L x W x H 9m x 7m x1.5m

8 SITE ALTERNATIVE

The Department of Environmental Affairs provides guidelines on the assessment of alternatives, to which the impact assessment be considered DEAT (2004a) and DEAT (2006). These alternatives are: location (site), activity (project), site layout, design, scale, routing, scheduling, process, demand, input and no-go alternatives. It is, however, important to note that the regulation and guidelines specifically state that only 'feasible' and 'reasonable' alternatives should be explored. It however, recognizes that the consideration of alternatives is an iterative process of feedback between the applicant and the appointed Environmental Assessment Practitioner (EAP), which in some instances culminates in a single preferred project proposal. Therefore, after weighing all project alternatives for this project, the '**site layout and design alternatives**' were considered as the major development alternative that would meet the stated need for and purpose of the project, by providing proper mitigation measures.

8.1 Alternative A (Site Layout Alternative)

The site layout alternatives permit consideration of different spatial configurations of an activity on a particular site. This may include particular components of a proposed development or may include the entire activity (DEAT, 2004a). Therefore, the proposed project site is already operating, and privately owned by the Amandla Power Agri, hence site layout has been configured within the existing private property under Amandla Power Agri property (**Figure 2**).

8.2 Alternative B (Design Alternative)

The design alternatives form an integral part of the project proposal and so become a part of the project description, as a result need not be evaluated as separate alternatives (DEAT, 2004a). The design alternatives form an integral part of the project proposal and so become a part of the project description, as a result need not be evaluated as separate alternatives (DEAT, 2004a). For this project, the project design provides for consideration additional eight (8) pigsties of (42mx10m) each in to augment the existing three (3), existing pigsties and a 90m³ slurry sump to temporary store the sludge from the pigsties, in order to accommodate the expansion of piggery to host approximately 500 pigs exclusive of piglets.

8.3 Alternative C (No-Go Alternative)

In the absence of the proposed development, Amandla Power Agri will miss an economic opportunity, to supply and grow the much aspiring pork industry and meet the market demand. This will not only affect Amandla Power Agri, but the local economy of eDumbe Local Municipality, Zululand District and KZN at large would have a missed opportunity, as the farming like other industries has economic multiplier effect through job creation and other suppliers and service provider servicing the industry (**refer to section 6.1& 6.2**).

The EAP is therefore of the view that the NO-GO option will be undesirable, in the face of socio-economical aspects for the local economy and districts DGDP, as well as the South African National Development Plan 2030 objectives.

8.4 Preferred Alternative

The role of alternatives is to find the most effective way of meeting the need and purpose of the proposal, either through enhancing the environmental benefits of the proposed activity, and or through reducing or avoiding potentially significant negative impacts (DEAT, 2004).

Looking at It is also important to note that the site within the transformed land, and the current land-use of the proposed site is agricultural, and the neighbouring sites include farms and farm dwellings, which makes the proposed expansion activities to blend in well with the surrounding environment. Therefore, looking at environmental impact likelihood and providing engineering to mitigate those impacts. The preferred alternatives are 'Site Layout and Design Alternatives'.

These preferred alternatives cannot be undertaken in isolation, as they both considered for this development footprint within the probate property. The 'Alternative A: Site Layout Alternative' will have minimal environmental degradation that might be expected during the course of the project, as there will be a minimum disturbance as most portion of construction will be within the farm property, which is already transformed. Also, after consideration of bio-physical and social environmental aspects, the 'Alternative B: Design Alternative' in line with a 'Site Layout Design' discussed above, is considered the most preferred alternatives for the proposed expansion of Amandla Power Agri Piggery. The design will involve housing the 500 pigs in adequate facilities (additional eight pigsties) of 42mx10m each, to reduce the concentration. Also, the drainage system for flushing of slurry into 90m³ slurry sump.

9 APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

In terms of the Environmental Regulations promulgated under the NEMA, an EIA must be conducted for any development or activity that requires an Environmental Authorisation. The listed activities in the NEMA, relevant to this project, that triggers the need for an Environmental Authorisation are listed below:

Table 5: Environmental Statutory Framework

Legislation	Relevance
Constitution of the Republic of South Africa, (No. 108 of 1996)	<ul style="list-style-type: none"> ➤ Chapter 2 – Bill of Rights. ➤ Section 24 – Environmental Rights.
National Environmental Management Act (NEMA) (No. 107 of 1998)	<ul style="list-style-type: none"> ➤ Section 24 – Environmental Authorisation (control of activities which may have a detrimental effect on the environment). ➤ Section 28 – Duty of care and remediation of environmental damage. ➤ Environmental management principles. ➤ Authorities – Department of Environmental Affairs (DEA) (national) and Department of Economic Development Tourism and Environmental Affairs (provincial).
GN No. 326 (7 April 2017)	<ul style="list-style-type: none"> ➤ Purpose - regulate the procedure and criteria as contemplated in Chapter 5 of NEMA relating to the preparation, evaluation, submission, processing, and consideration of, and decision on, applications for environmental authorisations for the commencement of activities, subjected to EIA, in order to avoid or mitigate detrimental impacts on the environment, and to optimise positive environmental impacts, and for matters pertaining thereto.
	<ul style="list-style-type: none"> ➤ Purpose – to identify activities that would require environmental authorizations prior to commencement of that activity and to identify competent authorities in terms of sections 24(2) and 24D of NEMA. ➤ The investigation, assessment, and communication of the potential impact of activities must follow the procedure as prescribed in regulations 19 and 20 of the EIA Regulations published in terms of section 24(5) of the Act. However, according to Regulation 15(3) of GN No. 327, Scoping and an Environmental Impact Report (S&EIR) must be applied to an application, if the application is for two or more

<p>activities as part of the same development for which S&EIR must already be applied in respect of any of the activities.</p> <p>➤ The proposed project triggers the Activities under Listing Notice 1.</p>		
<p>GNR No. 327 (7 April 2017) Listing Notice 1.</p>	<p>Activities under Listing Notice 1 that are relevant to this project are as follows;</p>	
	<table border="1"> <tr> <td> <p>Listed Activity 39: The expansion and related operation of facilities for the concentration of animals [for the purpose of commercial production] in densities that will exceed – (ii) 8 square meters per small stock unit, where the expansion will constitute more than; (b) 250 additional pigs, excluding piglets that are not yet weaned;</p> </td> <td> <p>Currently, the piggery houses 17 sows and 53 growers. This makes the total of 70 pigs excluding weaners (piglets).</p> <p>The farmer proposed to add 50 sows and 2 (two) boars to an existing stock. Given, the addition of 50 sows and 2 (two) boars, the Amandla Power Agri will be estimated to have 500 pigs or more with inclusion of growers. Therefore, the farm will exceed the threshold of 250 pigs.</p> </td> </tr> </table>	<p>Listed Activity 39: The expansion and related operation of facilities for the concentration of animals [for the purpose of commercial production] in densities that will exceed – (ii) 8 square meters per small stock unit, where the expansion will constitute more than; (b) 250 additional pigs, excluding piglets that are not yet weaned;</p>
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<p>National Water Act (Act No. 36 of 1998)</p>	<ul style="list-style-type: none"> ➤ Chapter 3 – Protection of water resources. ➤ Section 19 – Prevention and remedying effects of pollution. ➤ Section 20 – Control of emergency incidents. ➤ Chapter 4 – Water use. ➤ Authority – Department of Water and Sanitation (DWS). 	
<p>National Environmental Management Air Quality Act (Act No. 39 of 2004)</p>	<ul style="list-style-type: none"> ➤ Air quality management ➤ Section 32 – Dust control. ➤ Section 34 – Noise control. ➤ Authority – EDTEA. 	
<p>National Environmental</p>	<ul style="list-style-type: none"> ➤ Management and conservation of the country’s biodiversity. ➤ Protection of species and ecosystems. 	

Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	<ul style="list-style-type: none"> ➤ Authority – EDTEA.
Occupational Health & Safety Act (Act No. 85 of 1993)	<ul style="list-style-type: none"> ➤ Provisions for Occupational Health & Safety ➤ Authority – Department of Labour.
National Heritage Resources Act (Act No. 25 of 1999)	<ul style="list-style-type: none"> ➤ Section 34 – protection of structure older than 60 years. ➤ Section 35 – protection of heritage resources. ➤ Section 36 – protection of graves and burial grounds. ➤ Authority – KwaZulu-Natal Amafa and Research Institute
National Road Traffic Act 1996 (Act No. 96 of 1996)	<ul style="list-style-type: none"> ➤ Authority – KwaZulu-Natal Department of Public Works, Roads and Infrastructure.

10 DESCRIPTION OF THE PROJECT AREA

This section provides a general description of the status quo of the receiving environment in the project area. This serves to provide the context within which the Basic Assessment exercise was conducted. It also allows for an appreciation and identification of sensitive environmental features and possible receptors of the effects of the proposed project.

10.1 Climate

The Southern African region is divided into three climatic regions; Wet, dry and moderate. The region of the Kwa-Zulu Natal encompasses both, with categories such as humid subtropical (*Cfa*), oceanic climate (*Cfb*), hot semi-arid climates (*BSh*), tropical savanna climate (*Aw*), and

the subtropical highland oceanic climate (*Cwb*) as classified by Köppen and Geiger, but the most prevalent ones are *Cfa*, *Cfb*, *BSh* and *Aw* (Climate-Data.org).

The study region at Vryheid and Paulpietersburg within Zululand district falls under the (*Cwb*). This region has a sub-tropical climate with very hot and humid summers and mild winters. The temperature here is classified as warm and temperate, with the mean annual temperature of 16.6 °C. The region has a mean annual precipitation of 962mm mostly received between the late spring and summer season (October-March) and during cold front of winter season (Ezemvelo KZN Wildlife, 2015; Climate-Data.Org).

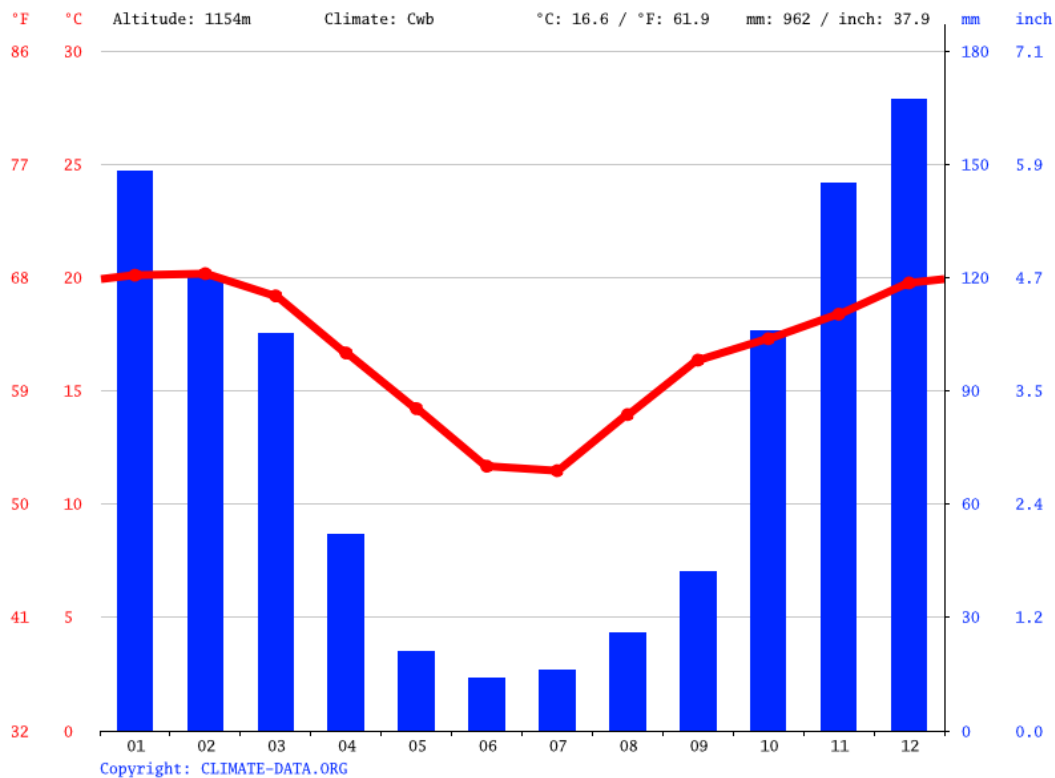


Figure 3: Vryheid and Paulpietersburg climate graph [Source: Climate-Data.Org]

10.1.1 Potential impact

The proposed development does not directly rely on climate, as the operation and also does not directly affect the climate change as there are no emission, except from methane from the piggery. The measures to mitigate the potential impacts will be considered further in the EMPr.

10.2 Hydrology

The hydrological system comprised of an interlinked system of ecosystems such as the headwaters of a river catchment, rivers and wetlands downstream, lakes, groundwater, estuaries and the marine environment (Ezemvelo KZN Wildlife, 2015).

The hydrological system of Zululand District forms a complex mosaic, occupying a variety of positions in the landscape across altitudinal gradients, ranging from open water bodies, vleis and marshes, down to extensive wetlands associated with stream and river courses and incised rivers which is drained through several major rivers (Ezemvelo KZN Wildlife, 2015).

The study area is located within quaternary catchment (W41F) within Pongola- Mtamvuma Water Management Area (WMA).

10.2.1 Rivers and dams

The Zululand District is traversed by major rivers, namely, Pongola river and its main tributaries the Pandana, Bazangoma, Lenjane, Mahashini, Mandlana, Ntombe, Bilanyoni, Nkemba and Ozwana rivers; The Bivane river with its larger tributaries: Opuzane, Gwakamakazi, Nsingani, Mbinkulu, Ncwayi, Mpemvana, Mbilane, Mawele and Bivanyana rivers; and Balladon Spruit river. These are free flowing rivers, incised through a steep valley and characterised by lack of inundation (impoundment). Apart from these large rivers, there is a network of smaller perennial rivers which drains the region (Ezemvelo KZN Wildlife, 2015).

However, there were no rivers and stream within the reach of the study area (**Figure 4**).

10.2.2 Wetlands

The wetlands distribution within Zululand District are closely linked with topography, as most of the wetlands occur mostly a variety of positions in the landscape across altitudinal gradients, ranging from open water bodies, vleis and marshes, down to extensive wetlands associated with stream and river courses. Also, the district has the following wetland vegetation types: Subtropical Alluvial Vegetation; Temperate Alluvial Vegetation; Temperate Alluvial Vegetation;

Midland Floodplain Grasslands; Eastern Temperate Wetlands; Subtropical Freshwater Wetlands; and Short Grass/ Sedge Wetlands (Ezemvelo KZN Wildlife, 2015).

There were no wetland vegetation and wetland within the reach 32m and 500m buffer coverage of the project site (**Figure 4 & 8**).

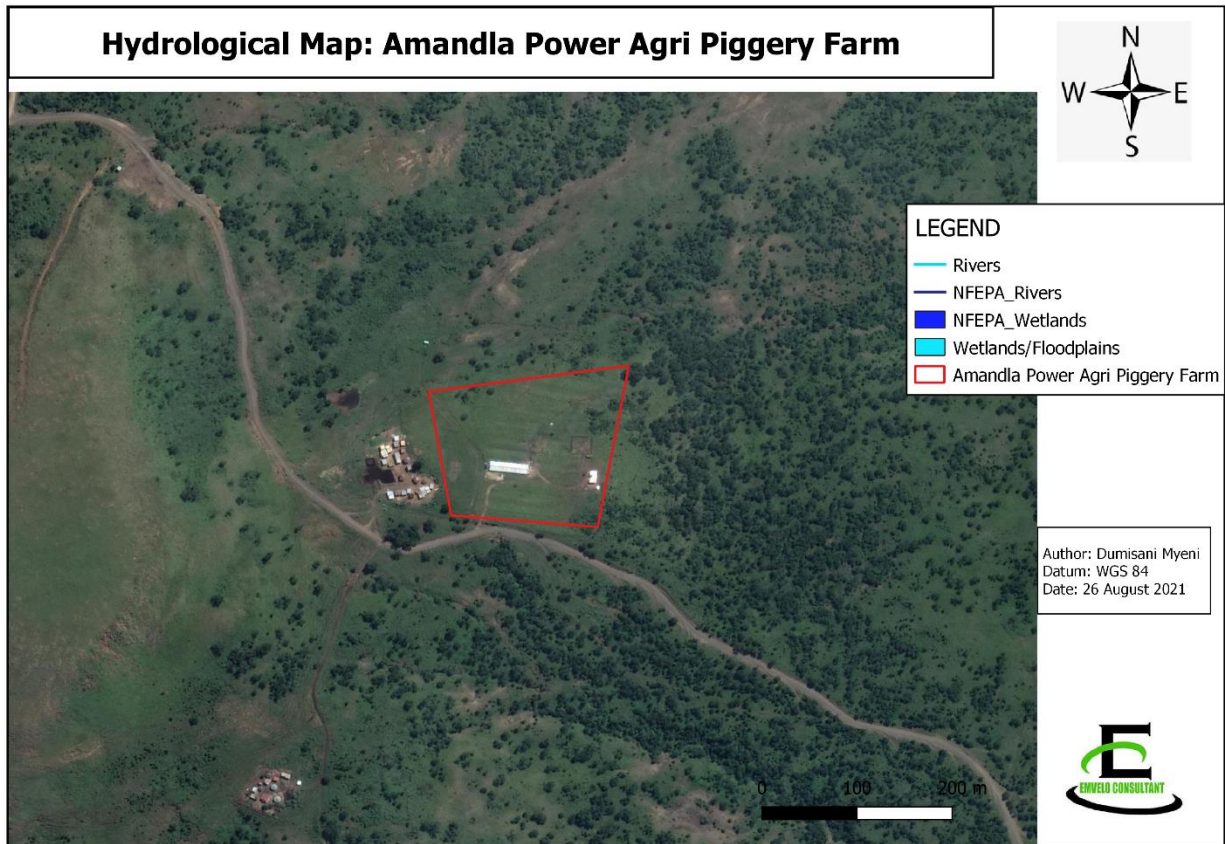


Figure 4: Hydrological Map (No hydrological features within 32 and 500m buffer coverage)

10.2.3 Potential impacts of the project hydrological features

The proposed development will have no impact in hydrological features as there are no hydrological components identified within the reach of the study area. However, the recommendations by the EMPr must be adhered to, in order to mitigate any impacts that may arise.

10.3 Topography

Zululand District has a varied topography that extends from the lowest plain situated in the eastern region and high relief situated at the north-western boundary, which translate to 480m and 2068m above mean sea-level, respectively. In totality, the district is classified as central highland with massive free-standing sandstone hills and high veld dotted along areas such as Vryheid, Pongola, Ulundi, and Paulpietersburg (Ezemvelo KZN Wildlife, 2014).

The study area is characterised by undulating terrain with altitudes ranging between 1040m and 1220m above mean sea-level, with the highest altitudes observed towards western part of the study area. The Mandla Power Agri piggery farm is situated within 1100m above mean sea-level (**Figure 5**).

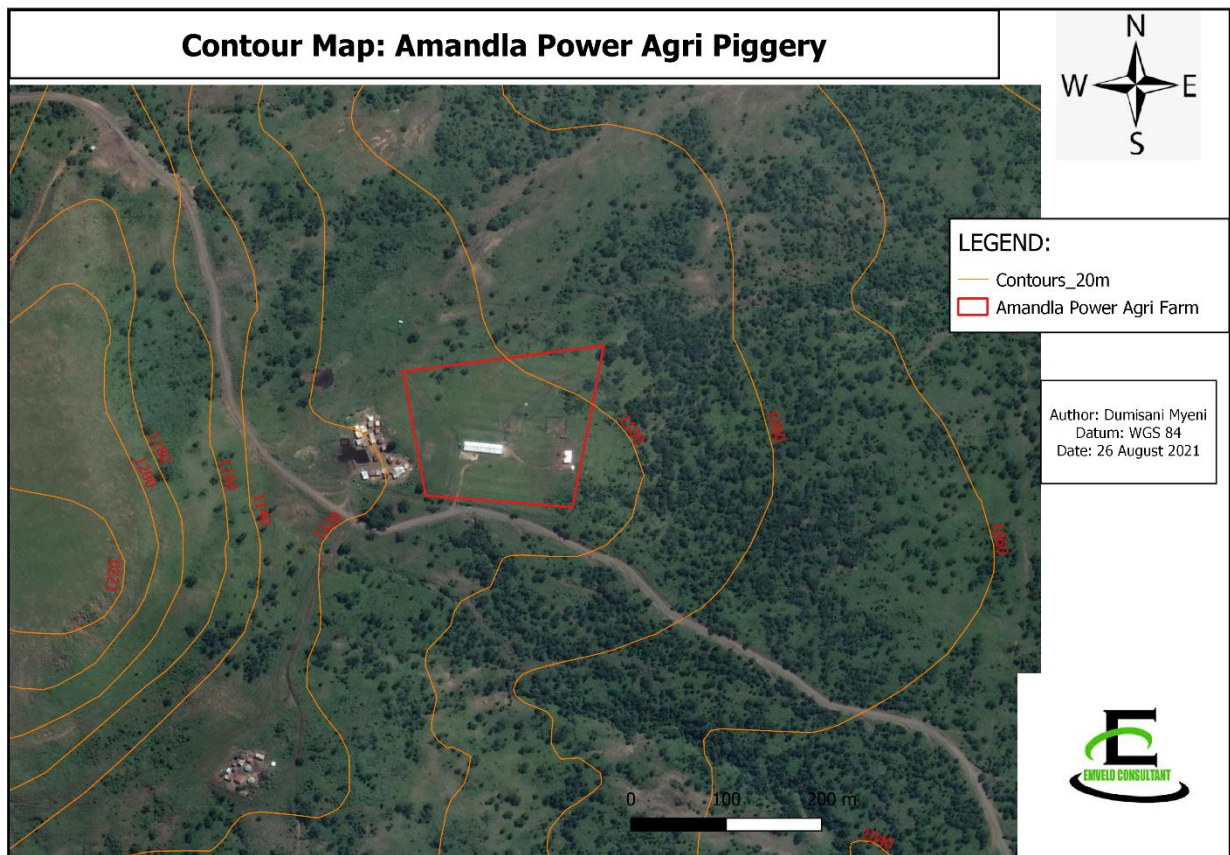


Figure 5: Contour Map showing elevations within the project area

10.3.1 Potential impacts

The gentle sloping terrain at vicinity of Mandla Power Agri piggery renders a smooth operation in terms of slurry flushing as the proposed slurry sump will be situated at down the slope gradient. Therefore, this gently sloping come as an advantage for proper functioning of drainage system, which will not require deep trenches etc. The potential impact could be experience as in most cases the sloping terrain renders the potential for run-off. However, proper mitigation can be achieved through carefully implementation of recommendations given by the EMPr.

10.4 Geology

The Zululand District's geological features are distributed across the region, forming a complex mosaic of geological features. Predominantly, the district is underlain by Karoo Sequence basalts, shales, siltstones, sandstones and conglomerates that have been intruded by dolerite dykes, sills and plugs of *Jurassic* age. In addition, eDumbe Municipality is divided into 5 lithology areas of import. The eastern region predominated by Shale, Granite and Quartzite which is the best area suitable for any development. The Tillites in the southern region can be indicated by the presence of underlying clays, that entails special measures for foundations when development takes place, whereas the Basalt form a hard base and outcrops (Ezemvelo KZN Wildlife, 2015).

The study area lies on the south-western region of a district and eastern region of eDumbe Local Municipality. The locality of the study site is underlain by Shale with Tillite intrusion with soil erodibility classified as Moderately Low (**Figure 6**).

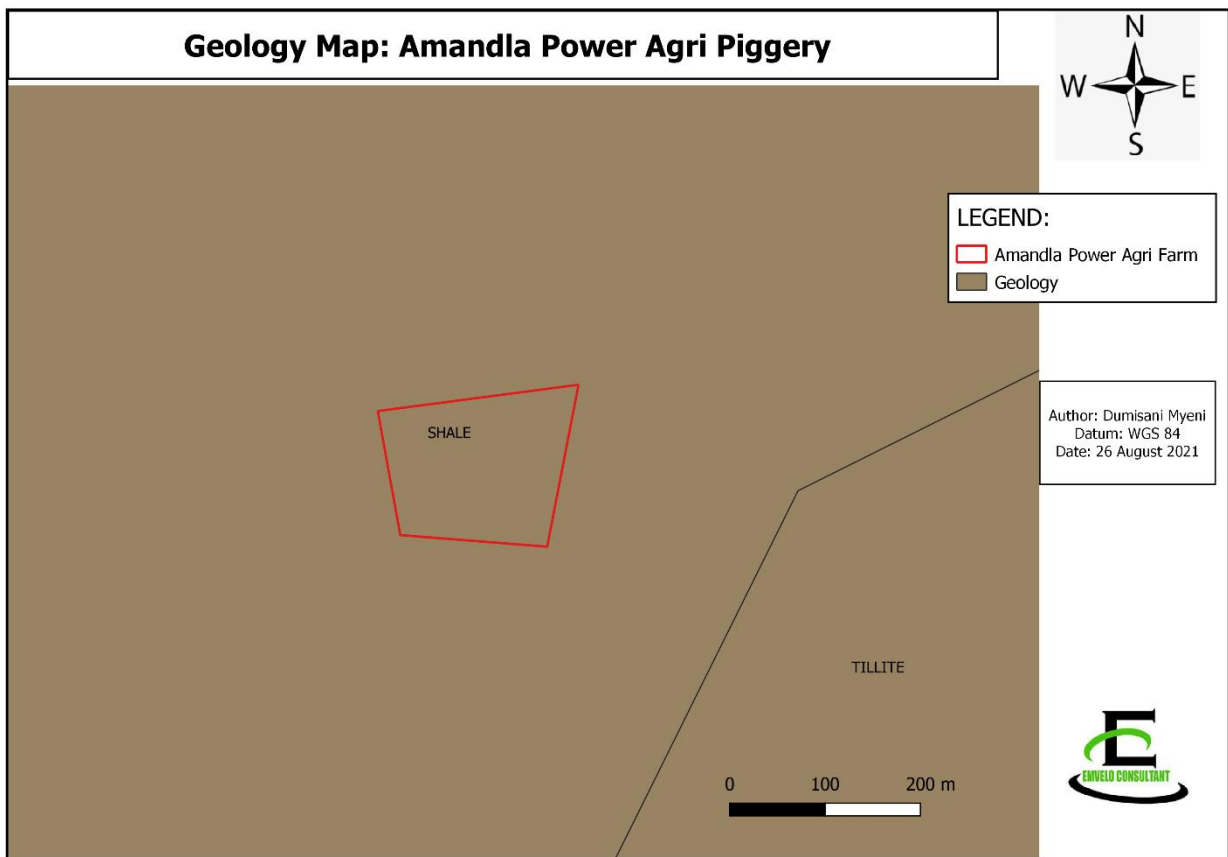


Figure 6: Map showing a dominance geological formation within the study area

10.4.1 Potential impacts

The construction activities for piggery include clearance for foundation, storm water system and slurry sump. These activities may have impact on geological stability as a result of run-off in case it is taken in a sloping topography. Therefore, the mitigation measures given by the EMPr must be adhered to in order to minimise any potential significant impacts that may arise.

10.5 Biomes

The Zululand District traverses five biomes (Wetland, Forest, Grassland, Savanna and Indian ocean Coastal Belt and 29 vegetation types, many of these vegetation types are threatened (Ezemvelo KZN Wildlife, 2014).

The project area in on the Savanna Biome, which is characterized by grassland intrusion, with dominantly KwaZulu-Natal Highland Thornveld (**Figure 7**).

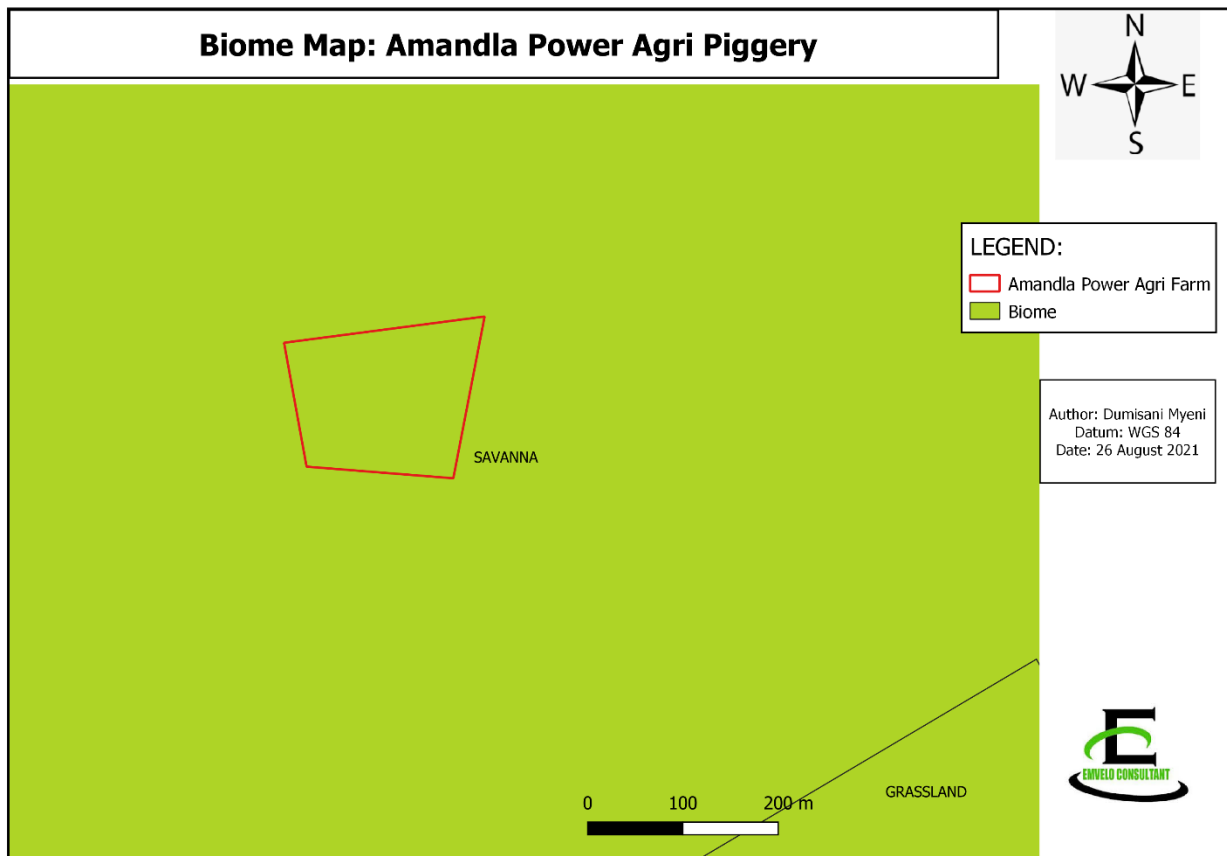


Figure 7: Map Showing the biome within the study area

10.6 Flora

Ugu District has a very rich vegetation endemism emanating from stratified biomes (**Section 10.5**). The district comprises: Temperate Alluvial Vegetation, Eastern Temperate Wetlands, Subtropical Freshwater Wetlands, Dry Coast Hinterland Grassland, Income Sandy Grassland, Northern KwaZulu-Natal Moist Grassland, Northern Zululand Mistbelt Grassland, Paulpietersburg Moist Grassland '**Vulnerable**'; Eastern Mistbelt Forests, KaNgwane Montane Grassland, Lebombo Summit Sourveld, Granite Lowveld, and Moist Coast Hinterland Grassland '**Endangered**'; Ngome-Nkandla Scarp Forest, and Delagoa Lowveld '**Critical Endangered**'; Subtropical Freshwater Wetlands : Short Grass/ Sedge Wetlands, Ithala Quartzite Sourveld, Wakkerstroom Montane Grassland, KwaZulu-Natal Highland Thornveld , Makatini Clay Thicket, and Northern Zululand Sourveld '**Less Threatened**' (Ezemvelo KZN Wildlife, 2015).

As mentioned above (**Section 10.5**) the vegetation within locality of the study is dominantly the as KwaZulu-Natal Highland Thornveld (GS 6), which has a national conservation status of 'Least Threatened' and the conservation target status of 23% (Munica and Rutherford 2006) (**Figure 8**). There were no species of conservational concern that were encountered on site, as the site is within a transformed land.

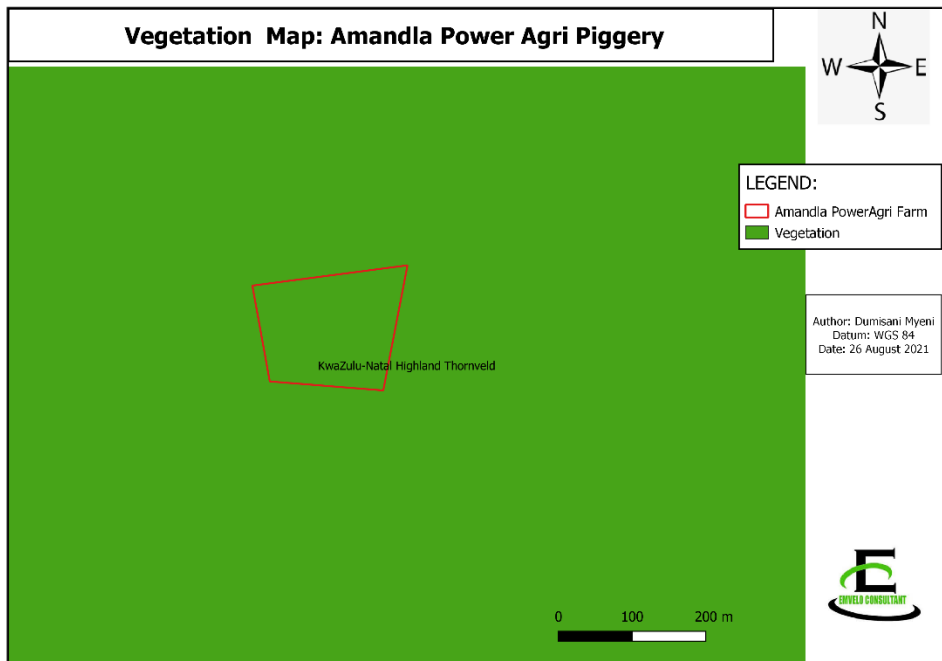


Figure 8: Map showing the vegetation types within the study area

There were three (3) discrete habitat types that were delineated within the assessment area, namely: secondary transformed shrub characterised of a ranch land. This habitat type was dominated, in terms of cover, by a mix of indigenous of as KwaZulu-Natal Highland Thornveld with grassland intrusion. This habitat type was regarded as possessing '**Low**' sensitivity due to the fact that there were no CBAs; The wasteland habitat was characterised by lay agricultural fields which has turned into ranch land, also possessing a '**Low**' sensitivity; Lastly, the transformed habitat type was characterised by present anthropogenic land-use and consisted of agricultural fields, roads and clustered homesteads. Due to its transformed character, the habitat type was regarded as possessing '**Low**' sensitivity. Moreover, the project site is within a transformed habitat, within Amandla Power Piggery farm.

10.6.1 Potential Impacts

Although, there will be no potential impacts with regard to vegetation, as a proposed expansion will be within transformed habitat in an existing piggery farm. Proper mitigation provided by EMPr must be adhered to.

10.7 Protected Areas

The KwaZulu-Natal Biodiversity Plan outline two main categories of areas that are required to meet conservation targets for the province. These two main categories include Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs). The CBAs represent the crucial for supporting biodiversity features and ecosystem functioning and are required to meet biodiversity and/or process targets including corridors. While the ESAs represent the Functionality but not necessarily entirely natural areas that are required to ensure the persistence and maintenance of biodiversity patterns and ecological processes within Critical Biodiversity Areas (Ezemvelo KZN Wildlife, 2016).

Zululand district is a hoist to six (6) prestigious provincial nature reserves, namely: Ithala Nature Reserve, Phongolo Bush Nature Reserve, Phongolo Nature Reserve, eMakhosini-Ophathe Heritage Park, Vryheid Mountain Nature Reserve, and Hluhluwe-iMfolozi Park. One (1) national reserve, namely, Ntendeka Wilderness Area (Ngoma State Forest). A number of stewardship sites, stewardship focus areas and natural heritage sites (Ezemvelo KZN Wildlife, 2015).

Upon interrogation of the KZN Biodiversity Conservation Plan (KZNBCP) for terrestrial areas KZN Biodiversity Plan, it was observed that there were no protected areas and no CBAs within the reach of the study area (**Figure 9**). Moreover, there were no ESA within the reach of the study area. The project area reflects no biodiversity conservation significant (**refer to table 6**).

Table 6: Subcategories of CBA and ESAs [Source: Ezemvelo KZN Wildlife,2016]

Critical Biodiversity Areas (CBAs) – Crucial for supporting biodiversity features and ecosystem functioning and are required to meet biodiversity and/or process targets	
Critical Biodiversity Areas: Irreplaceable	Areas considered critical for meeting biodiversity targets and thresholds, and which are required to ensure the persistence of viable populations of species and the functionality of ecosystems.
Critical Biodiversity Areas: Optimal	Areas that represent an optimised solution to meet the required biodiversity conservation targets while avoiding high cost areas as much as possible (Category driven primarily by process, but is informed by expert input).
Ecological Support Areas (ESAs) – Functional but not necessarily entirely natural areas that are required to ensure the persistence and maintenance of biodiversity patterns and ecological processes within Critical Biodiversity Areas.	
Ecological Support Areas	Functional but not necessarily entirely natural terrestrial or aquatic areas that are required to ensure the persistence and maintenance of biodiversity patterns and ecological processes within the Critical Biodiversity Areas. The area also contributes significantly to the maintenance of Ecosystem Services.
Ecological Support Areas: Species Specific	Terrestrial modified areas that provide a critical support function to a threatened or protected species, for example agricultural land or dams associated with nesting/roosting sites.
Ecological Support Areas: Buffers	Terrestrial areas identified as requiring land-use management guidance not necessarily due to biodiversity prioritisation, but in order to address other legislation/ agreements which the biodiversity sector is mandated to address, e.g. WHS Convention, Triggers Listing Notice criteria, etc.

Furthermore, the study area mainly falls under a transformed habitat, within Amandla Power Piggery farm. Also, there were no SCC plant species identified within the study area (**refer to Section 10.6**).

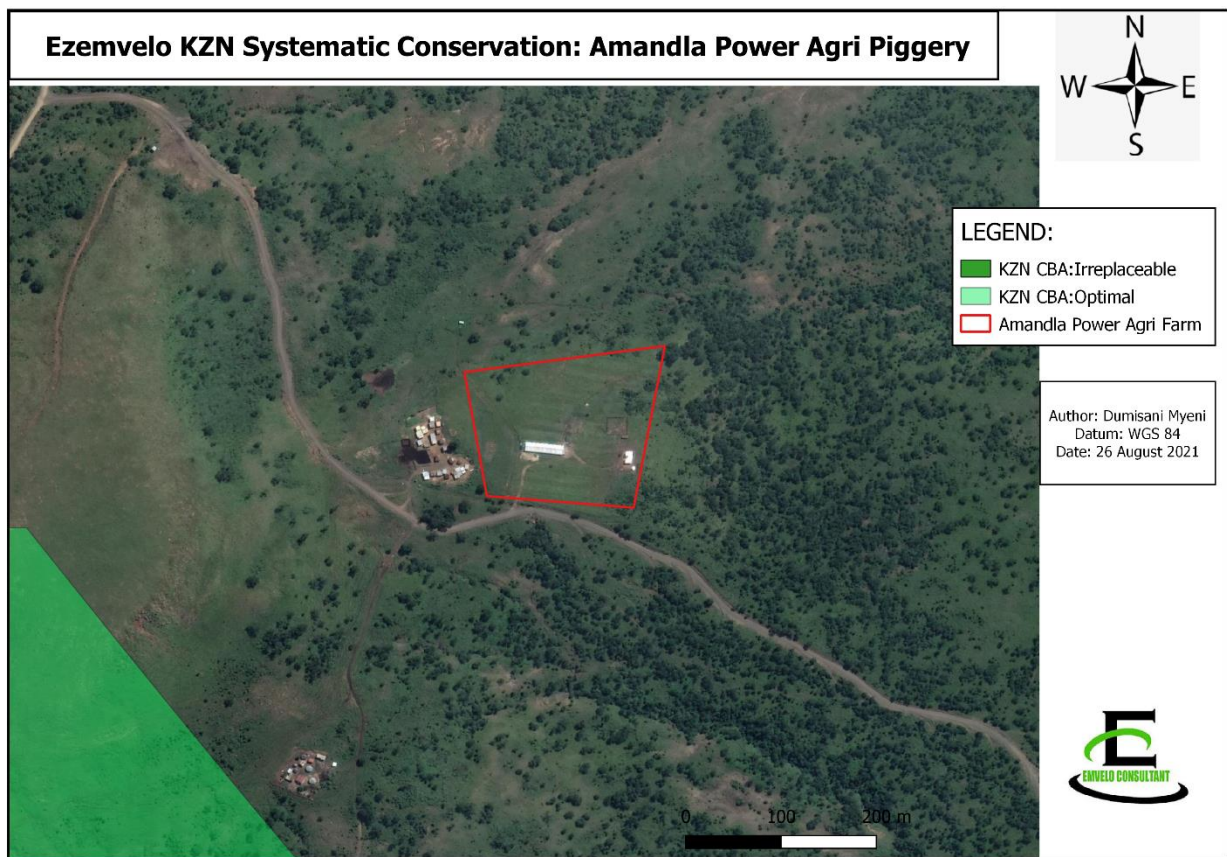


Figure 9: Map showing KZN Systematic Conservation within the study area

10.7.1 Potential Impacts

Although, there will be no potential impacts with regard to vegetation, as a proposed expansion will be within transformed habitat in an existing piggery farm, and there are no CBAs within the study area. Proper mitigation provided by EMPr must be adhered to.

10.8 Fauna

The Zululand district hoist some red data faunal species, which include: mammal species, bird, invertebrates and reptiles. However, most of these species are in protected areas mentioned in (**Section 10.7**). The district is home to at least 2 Critically Endangered species, 4 Endangered species, 35 Vulnerable species, and 50 Near Threatened species (Ezemvelo KZN Wildlife, 2015).

In addition, when the study region was interrogated against Quarter Degree Square (2730DB) obtained from Fitzpatrick Institute of African Ornithology Virtual Museum, the study region also confirms the availability of following bird species: The *Anthropoides paradiseus* (Blue crane) '**Vulnerable**'; All recorded reptile species within the region are of 'Least Concern'; All invertebrates recorded within the region are of 'Least Concern'; The mammal species recorded include those within the protect area: *Ourebia ourebi* (Oribi) '**Endangered**', *Leptailurus serval* (Serval) '**Near Threatened**', and *Panthera pardus* (Leopard) and *Smutsia temminckii* (Ground Pangolin) '**Vulnerable**'.

There were no protected areas and CBAs near the proposed development, also the site is within the transformed habitat as a result there were faunal species foraging within the study site.

10.8.1 Potential Impacts

Although, there will be no potential impacts with regard to faunal species as far as concerned, as a proposed expansion will be within transformed habitat in an existing piggery farm, and there are no CBAs within the study area. Proper mitigation provided by EMPr must be adhered.

10.9 Visual environment and land use character

Subject to the direct visual influence of the proposed project, the zone of visual influence can be experienced at different scales by receptors located at various distances from the site. The viewshed area and zone of visual influence for new developments is classified as follows:

- High visibility - Visible from a large area (several square kilometres, >5km radius)
- Moderate visibility - Visible from an intermediate area (several hectares, 2.5 – 5 km radius).
- Low visibility - Visible from a small area around the project site (<1km radius).

Therefore, Since the proposed development is within the transformed habitat and the current land use within the study area is currently agriculture comprising the ranch land, crop farming, poultry farming and existing piggery within a proposed site (**Figure 10**). The proposed expansion will blend with immediate land use, and also is considered to have no negative

visual impacts or only during the construction can be considered “*low visibility*” as it can be visible from a small area around the project site (<1km radius).



Figure 10: Local environment (existing piggery, ranch land, and other farms)

10.9.1 Potential Impacts

The proposed expansion will blend with immediate land use, and also is considered to have no negative visual impacts, provided that dust and other visibility aspects are managed through proper implementation of recommendation provided by EMPPr.

10.10 Heritage and cultural aspects

Zululand District is part of a larger historical area also known as Zululand district offers a window of historical sites due to rich history dating from King Shaka’s reign. Also, availability archaeological sites which includes: Early Stone Age, Middle Stone Age, Later Stone Age,

Indeterminate Stone Age, Early Iron Age, Late Iron Age, Indeterminate Iron Age, Rock art, and Historical (Zululand District Development Model, 25/56).

A preliminary desktop study for palaeontological fossils sensitivity of the proposed site, reveals that the site falls within a very low sensitivity, as result a field assessment and protocol for finds is not required for this study (**Figure 11**).

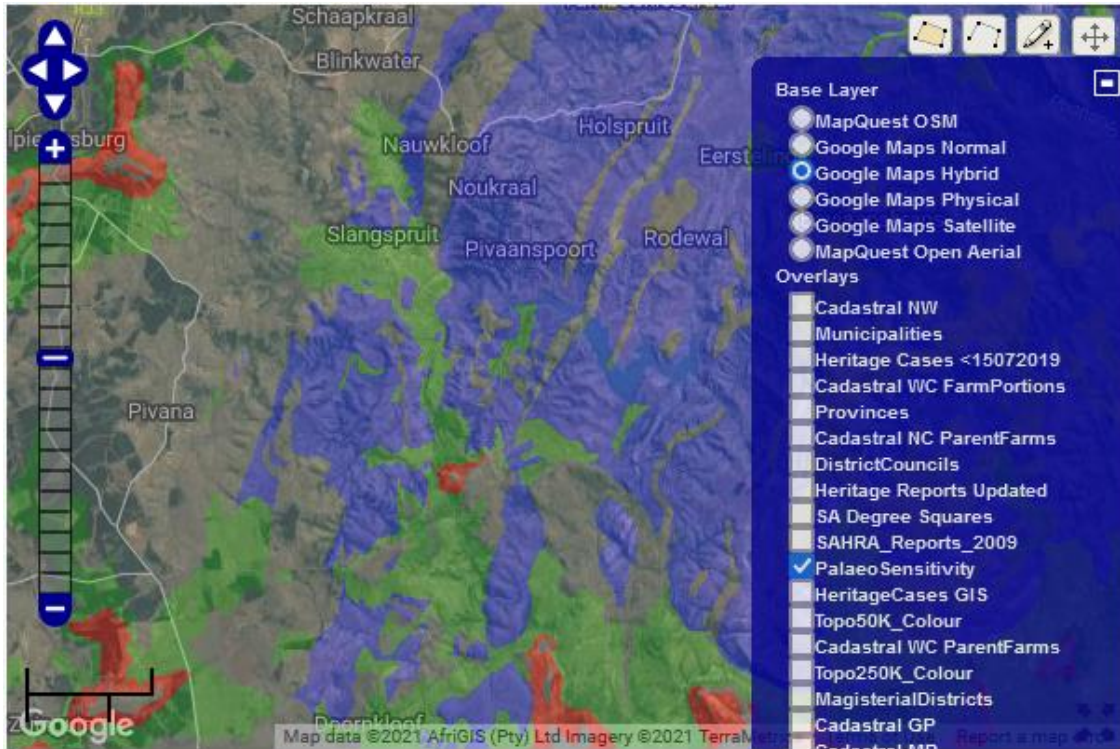


Figure 11: Palaeontological Sensitivity [<https://sahris.sahra.org.za/node/add/heritage-cases>]

There were no archaeological or historical resources that were identified within the project footprint. However, the inquiry has been lodged with AMAFA to ascertain whether there are any cultural and heritage sites within the study area. Findings will be incorporated into the final Basic Assessment Report.

10.10.1 Potential Impacts

Based on desktop studies and site investigation there are no records of archaeological resources, and also as provided by (**Figure 11**), a preliminary desktop study for

palaeontological fossils sensitivity of the proposed site, reveals that the site falls within a very low sensitivity. Also, the proposed development will take place within an existing piggery farm. Therefore, the project will have no negative impacts, provided that all archaeological and other cultural and heritage aspects are managed through proper implementation of recommendation provided by EMPr.

10.11 Social and economic aspects

Amandla Power Agri Piggery is within the jurisdiction of eDumbe Local Municipality, which is a rural municipality with its local economy stream largely come from agriculture. Apparently, according to Census 2011, the region has high unemployment rate, and those that are employed are in retail, government and majority in agricultural sector, making agriculture a great contributor in terms of seasonal and permanent employment.

As discussed in (**Section 6**) the expansion of Amandla Power Agri piggery, will not only grow Amandla Power Agri as a business but will be the one of the most important components in addressing unemployment issues within the local, district and national level.

10.11.1 Potential Impacts

In light with above (**Section 10.11**) explained situational analysis within eDumbe Municipality, it is expected that the local community benefits through jobs during the construction and during operation phase, which will also enable the transfer of skills and boost the local economy, in the process alleviate poverty and decrease dependency ratio. Also, to note that agriculture have economic multiplier effects whereby the money will circulate within the local economy through supply of services and goods to the farm in the process creates more jobs in terms of local businesses.

11 WASTE, EFFLUENT, AIR POLLUTION AND ATMOSPHERIC EMISSIONS

Construction and operation activities, like other operations, also leads to pollution of air, land and water bodies, due to the general and hazardous waste emanating from the activities.

11.1 Waste management: construction phase

The construction and operational phase of the proposed activity will result in the generation general and hazardous waste.

Construction Phase:

The construction phase will generate general solid waste (rubble, cement bags, general domestic waste etc.) as well as hazardous waste such as empty chemical containers etc. The general waste during the construction will be sorted into recyclable and non-recyclable waste bins. The non-recyclable waste will be disposed of to Vryheid or Edumbe landfill site.

Operational Phase:

The operational phase will generate both general and hazardous waste. General waste from various packaging and domestic waste, as well as biohazardous (medical equipment, unused animal medication) and hazardous waste (cleaning materials, oils and other chemical solvents). The feed packaging such as sacks will be re-used to pack supplies or spilled feeds, and the hazardous waste will be collected by the certified waste services. Other general waste will be disposed of to nearest land fill site at eDumbe or Vryheid landfill sites.

The piggery will generate slurry waste which will be a mixture of waste feed, pig's urine and faeces. This slurry waste will be flushed down through drainage system into a slurry sump. Also, in some case the pig's carcasses, which will be disposed of by digging and burying them in order to safely decompose naturally.

11.2 Effluent

Construction Phase:

No effluent will be generated during the construction phase of the project. Proper measures will be put in place to contain any spillages (oil spills) occurring during construction, as prescribed by EMPr.

Operational Phase:

The operational phase of the proposed expansion pig farm will result in accumulation of wet slurry within the facility. The slurry comprises wash water, feed, faeces, and urine. The slurry will be flushed through the drainage system into the slurry pit on site for temporal storage, will then be emptied by the honey sucker tractor (service provider) and then distributed to local crop farmers for use as manure. Therefore, the slurry is regarded as a by-product for piggery operation.

11.3 Ambient air pollution and atmospheric emissions

The proposed development itself will not have direct impact on air pollution and atmospheric emission during construction and operational phase. However, certain activities associated with livestock farming is largely associated with nuisance and ambient odour issues if their concentration and hygiene is unkept and not monitored. But these can be felt within the proximity of the facility. These impacts can be mitigated through adherence to the EMPr.

11.4 Noise management

The project will have no impact on noise pollution as the piggery facility is located within isolated farming area. The potential noise pollution impacts will be mitigated provided that the EMPr is adhered to.

12 WATER USE

Currently, the farm uses the borehole water, as a result Amandla Power Agri (Pty) Ltd is currently in an application stage of Water Use License. The water use will include water construction, piggery farming consumption, equipment cleaning and hygiene as well as drinking and consumption for farm compound.

13 ASSOCIATED INFRASTRUCTURE

Energy supply:

The provision of electricity falls under the mandate of Eskom. Therefore, the electricity supply with the farm areas comprise medium to low voltage. Amandla Power Agri Piggery facilities

currently have low voltage. Amandla power Agri has also applied for energy supply augmentation (another electricity distribution) with Eskom to supplement the expansion. Also, there is a back-up power generator onsite in case of load shedding.

Access road:

The farm makes use of existing access road (L2337 road) traversing next to the piggery farm.

14 THE PUBLIC PARTICIPATION PROCESS

Section 24 (4) (a) (v) of NEMA, provides that the procedures for the investigation, assessment and communication of the potential consequences or impacts of activities on the environment, must ensure, with respect to every application for an Environmental Authorisation, the public information and participation procedures which provide all interested and affected parties, including all organs of state in all spheres of government that may have jurisdiction over any aspect of the activity, with a reasonable opportunity to participate in those information and participation procedures.

14.1 Background

Public Participation Process (PPP) is part of the EIA process which is governed under the principles of NEMA as well as the EIA regulations. It is defined as the process by which an organization consults with all interested or affected parties (I&APs) which include organizations, government entities, affected communities, non-governmental organisations (NGOs), etc. It is a two-way communication process and collaborative problem solving with the goal of achieving better and more acceptable decisions.

The PPP also provides all the stakeholders including the community with a platform to raise their environmental concerns before the Competent Authority can make a final decision regarding the issuing of the Environmental Authorization. This prevents and minimizes disputes before they become unsolvable. Chapter 6 of the EIA regulations emphasize that the information related to the proposed project must be made available to I&APs, prior to a final decision. Therefore, this process will allow I&APs to have access to the information relating to

this project. The application was conducted according to Chapter 6 of the EIA Regulations 2017.

14.2 Objectives of public participation

The objectives are as follows:

- To inform and involve the community and the stakeholders about the proposed development;
- To identify and address the community and stakeholder’s environmental concerns regarding this activity;
- To provide opportunities for the community, relevant government departments, surrounding businesses, the residents and other stakeholders to raise their environmental concerns, suggest solutions and identify priorities or issues;
- To protect the environmental rights of the local community; and
- To optimise on local and indigenous knowledge of the area.

14.3 Notification of the Interested and Affected Parties (I&APs)

Section 41 of Chapter 6 of the EIA regulations have listed the different options, to be used when notifying the I&APs. The PP process for this project was conducted, as detailed in Table 5 and indicated by the green blocks.

Table 7: Public Participation Processes

<i>All the Interested and Affected parties were notified of the application by-</i>		
Fixing a notice board at the place conspicuous to and accessible by the public at the boundary, on the fence, or along the corridor of any alternative sites.	YES	NO
Any alternative site also mentioned in the application	YES	NO
<i>Has a written notice been given to-</i>		
Landowner or person in control if the applicant is not in control of the land	YES	NO
The municipal councillor of the Ward in which the site and alternative site of the proposed activity.	YES	NO

The municipality which has jurisdiction in the area and other organs of state	YES	NO
<i>Placing an advertisement in-</i>		
Local newspaper (isiZulu News Papers)	YES	NO
Any official Gazette that is published specifically for providing public notice of applications	YES	NO
One provincial newspaper, any official Gazette that is published with the purpose of providing public notice of applications.	YES	NO

14.4 Comments from the registered Interested and Affected Parties (I&APs).

Section 43 of Chapter 6 of NEMA (EIA Regulations 2017) indicates that all I&APs are entitled to comment in writing on all reports produced by the applicant during the EIA process. This will bring the concerns raised to the attention of the applicant.

The I&APs were provided with the opportunity to raise their concerns and comments regarding the proposed development project. Firstly, a Background Information Document (BID) was sent to all relevant I&APs. The onsite notices in isiZulu were posted onsite on 19th July 2021. Notices were displayed in strategic positions in the project area in order to enhance accessibility from the public. Following, the posting of onsite notices, the newspaper advert in isiZulu was published by Ilanga News Paper (*19-21 August 2021 edition*). The Focus group meeting comprising of nearby farm dwellers and ward councillor was conducted. The community stakeholder was afforded an opportunity for public participation.

Public participation activities and reports are attached in Appendix E (Public Participation).

15 IMPACT ASSESSMENT AND MITIGATION MEASURES

The Environmental Impact Assessment (EIA) conducted for the construction phase and the operational phase for the site, are discussed in (**section 15.1**) below.

Each impact identified is assessed in terms of probability (likelihood of occurring), scale (spatial scale), magnitude (severity) and duration (temporal scale). To effectively implement the adopted scientific approach in determining the significance of the environmental impact, a numerical value was linked to each rating scale.

The following criteria will be applied to the impact assessment for the proposed development:

Occurrence

- ✚ Probability - the probability of the impact describes the likelihood of the impact actually occurring.
- ✚ Impact duration - the duration of the impact describes the period of time during which an environmental system or component is changed by the impact.

Severity

- ✚ Magnitude – refers to the ‘degree of disturbance’ to biophysical systems and components which expresses the change in the health, functioning and/or role of the system or component as a result of an activity.
- ✚ Scale/extent - the extent of the impact generally expresses the spatial influence of the effects produced by a disturbance to an environmental system or component.

The following ranking scales were used:

<i>Probability = P</i>	<i>Duration = D</i>
5 – Definite (More than 80 % chance of occurrence)	5 – Permanent - The only class of impact that will be non-transitory (indefinite)
4 – Probable (Between 60-80% chance of occurrence)	4 - Long-term - The impact and its effects will continue or last for the entire operational life of the development (15 - 50years)
3 – Possible (Between 40-60% chance of occurrence)	3 - Medium-term - The impact and its effects will continue or last for some time after the construction phase (5 - 15 years)
2 – Fairly Unlikely (Between 20-40% chance of occurrence)	2 – Medium-short - The impact and its effects will continue or last for the period of a relatively long construction period and/or limited recovery time after this construction period (2 - 5 years)
1 – Unlikely (Less than 20% chance of occurrence)	1 – Short Term - Likely to disappear with mitigation measures or through natural processes which span shorter than the construction phase (0-2 years)

<i>Scale = S</i>	<i>Magnitude = M</i>
5 – International (beyond 200km)	5 - High
4 – Regional (50-200km radius)	4– Medium High
3 – Local (2-50km radius)	3 – Medium
2 – Surrounding area (within 2km)	2 – Medium Low
1 – Site (within100m)	1 – Low

Status of Impact

+ Positive / -Negative or 0-Neutral

The overall impact significance score/points (SP) for each identified impact is calculated by multiplying magnitude, duration, and scale by the probability of all this happening.

The range of possible significance scores is classified into seven rating classes (**refer to section 15.1**).

$$SP = (\text{Magnitude} + \text{Duration} + \text{Scale}) \times \text{Probability}$$

The impacts status can either be positive, negative or neutral as depicted in table below.

Significance	Environmental Significance Points	Colour Code
Negligible	0-10	N
Very low	11-20	VL
Low	21-30	L
Medium	31-40	M
Medium-High	41-50	MH
High	51-60	H
Very high	61-75	VH

15.1 Impact Analysis (Preferred Site Layout and Design Alternatives)

Potential impact	Impact Significance without Mitigation	Proposed Mitigation Measures	Impact Significance with mitigation
Project Planning			
<p>Unnecessary damage and disturbance to natural vegetation due to poor planning:</p> <p>Vegetation clearance and erosion due to poor planning, site layout and design such as, poor layout and demarcation.</p>	<p>Low (24)</p> <p>SP= (M + D + S) × P SP= (3 + 3 + 2) × 3</p> <p>SP =24</p>	<ul style="list-style-type: none"> ➤ Since the construction will take place within existing piggery farm, the clearance must be minimal, and limited only to farm boundary. ➤ Excavation for foundation should only take place where facilities are constructed, also be limited to construction footprint as demarcated and approved by project plans. ➤ Erosion at sloping zones must be mitigated by proper implementation of storm-water management plan. ➤ A construction site camp must be developed within the farm property, or use existing buildings. 	<p>Negligible (5)</p> <p>SP= (M + D + S) × P SP= (2 + 1 + 1) × 1</p> <p>SP =4</p>
<p>Loss of plant Species of Conservation Concern (SCC):</p> <p>There were no SCC within the proposed site, as the site is within a piggery farm which is an already transformed habitat. Also, there were no CBAs within the project reach. However Poor planning and construction may result in the permanent loss of various plant species outside the site boundary.</p>	<p>Very-Low (18)</p> <p>SP= (M + D + S) × P SP= (4 + 3 + 2) × 2</p> <p>SP =18</p>	<ul style="list-style-type: none"> ➤ Develop site layout to demarcate site boundary ➤ The clearance must be minimal, and limited only to farm boundary ➤ Minimize clearance by only clearing areas as demarcated and approved by project plans. 	<p>Negligible (5)</p> <p>SP= (M + D + S) × P SP= (2 + 1 + 1) × 1</p> <p>SP =4</p>

Potential impact	Impact Significance without Mitigation	Proposed Mitigation Measures	Impact Significance with mitigation
Project Planning			
<p>Degradation of ground water quality as a result of poor planning.</p> <p>Poor design and / or implementation of the planned infrastructure associated with piggery would lead to ground water pollution.</p>	<p>Medium-High (44)</p> <p>SP= (M + D + S) × P SP= (5 + 4 + 2) × 4 SP = 44</p>	<ul style="list-style-type: none"> ➤ Adequate drainage system ➤ Concrete lined slurry sump 	<p>Negligible (5)</p> <p>SP= (M + D + S) × P SP= (3 + 1 + 1) ×1 SP = 5</p>
<p>Pollution as a result of poor piggery planning</p> <p>Poor design and / or implementation of the planned infrastructure associated with piggery would lead to ground water pollution.</p>	<p>High (60)</p> <p>SP= (M + D + S) × P SP= (5 + 5 + 2) × 5 SP = 48</p>	<ul style="list-style-type: none"> ➤ Develop Integrated waste management plan ➤ All waste to be disposed of at registered landfill site ➤ Develop an environmental health policies 	<p>Very-Low (15)</p> <p>SP= (M + D + S) × P SP= (3 + 1 + 1) × 3 SP = 15</p>

Potential impact	Impact Significance without Mitigation	Proposed Mitigation Measures	Impact Significance with mitigation
Construction Phase			
<p>Loss of indigenous vegetation during construction:</p> <p>The proposed site is an existing piggery farm. Therefore, comprise of transformed habitat. However, uncontrolled construction activities beyond the required footprint of the project area.</p>	<p>Medium-High (50)</p> <p>$SP = (M + D + S) \times P$ $SP = (5 + 3 + 2) \times 5$ $SP = 50$</p>	<ul style="list-style-type: none"> ➤ Clearance for the purpose of construction of piggery facility and associated infrastructure construction must be limited to only clearing areas demarcated and approved by project plans and layout. ➤ Only the approved existing farm access road must be used, and vehicles must not traverse virgin land. ➤ The project boundary must be demarcated and site clearing as well as topsoil removal must be limited to site only. 	<p>Very-Low (12)</p> <p>$SP = (M + D + S) \times P$ $SP = (3 + 2 + 1) \times 2$ $SP = 12$</p>
<p>Loss of plant species of conservational concern:</p> <p>The proposed site is an existing piggery farm. Therefore, comprise of transformed habitat. Moreover, there are no plant SCC identified within the project, and no CBAs within the project reach. However, uncontrolled construction activities beyond the required footprint of the project area.</p>	<p>Very-Low (20)</p> <p>$SP = (M + D + S) \times P$ $SP = (5 + 3 + 2) \times 2$ $SP = 20$</p>	<ul style="list-style-type: none"> ➤ Although, the site is within the transformed habitat, the project site must be surveyed prior to construction for identification of plant SCC. ➤ Install fence/buffers to restrict development from encroaching the sensitive environment. ➤ If identified, establish buffer to section with plant SCC and declare it a no-go area. ➤ If possible the plant species of conservation concern must not be removed, or disturbed. ➤ If needed, approval must be obtained from the a specialized Botanist. 	<p>Negligible (4)</p> <p>$SP = (M + D + S) \times P$ $SP = (2 + 1 + 1) \times 1$ $SP = 4$</p>

Potential impact	Impact Significance without Mitigation	Proposed Mitigation Measures	Impact Significance with mitigation
Construction Phase			
<p>Degradation of freshwater (aquatic) habitat as a result of construction activities.</p> <p>There are no watercourses (stream, wetlands etc.) within 32m and 500m buffer coverage of the proposed site (piggery farm).</p>	<p>Negligible (4)</p> <p>SP= (M + D + S) × P SP= (1 + 1 + 2) × 1 SP = 4</p>	<ul style="list-style-type: none"> ➤ All drainage system must channel to slurry sump. ➤ Unauthorized abstraction of water from water features must be prohibited. 	<p>Negligible (3)</p> <p>SP= (M + D + S) × P SP= (1 + 1 + 1) × 1 SP = 3</p>
<p>Disturbance of terrestrial species habitat as a result of construction activities</p> <p>The proposed site is an existing piggery farm. Therefore, comprise of transformed habitat. Moreover, there are no animal SCC identified within the project, and no CBAs within the project reach. However, uncontrolled construction activities beyond the required footprint of the project area.</p>	<p>Very-Low (20)</p> <p>SP= (M + D + S) × P SP= (5 + 3 + 2) × 2 SP = 20</p>	<ul style="list-style-type: none"> ➤ Although, the site is within the transformed habitat, the project site must be surveyed prior to construction for identification of potential animal SCC prior to construction in order to locate, capture and relocate any animal SCC. ➤ All construction activities must take place within an area demarcated for the development. ➤ Install fence/buffers to restrict development from encroaching the sensitive environment. 	<p>Negligible (3)</p> <p>SP= (M + D + S) × P SP= (1 + 1 + 1) × 1 SP =3</p>
<p>Disturbance to surrounding wildlife and fauna:</p> <p>Uncontrolled construction activities: vehicle movements, noise and habitat destruction will disturb animals in the area. As a result, this is likely to result in the migration of species which are</p>	<p>Medium-High (44)</p> <p>SP= (M + D + S) × P</p>	<ul style="list-style-type: none"> ➤ Construction activities must be limited to the designated development footprint. ➤ During site preparation, special care must be taken during the clearing of the works area in 	<p>Negligible (5)</p>

Potential impact	Impact Significance without Mitigation	Proposed Mitigation Measures	Impact Significance with mitigation
Construction Phase			
endemic to the project area or a loss of animal species currently foraging around the project area.	SP= (5 + 3 + 3) × 3 SP = 44	<p>order to minimize damage or disturbance of roosting and nesting sites.</p> <ul style="list-style-type: none"> ➤ No faunal species are to be disturbed, trapped, hunted or killed during the construction phase. ➤ All construction and maintenance vehicles must stick to properly demarcated and prepared roads. ➤ Driving on virgin land must be strictly prohibited. ➤ No fires should be allowed at the site. 	SP= (M + D + S) × P SP= (2 + 1 + 2) × 1 SP = 5
Soil erosion: <p>The in-situ material erodibility is considered to be moderate. However, uncontrolled construction activities beyond the required footprint, as well as poor construction process during site clearing, topsoil removal and excavation works could result in soil erosion. Furthermore, the disturbed soils are prone to surface run-off.</p>	Medium (36) SP= (M + D + S) × P SP= (5 + 5 + 2 × 3 SP =36	<ul style="list-style-type: none"> ➤ Best construction practices to be followed to provide good drainage and prevent erosion. ➤ Clearance and topsoil removal must be kept as minimal as possible to areas as demarcated by the project plans and to make use of natural erosion suppressors such as good grassland cover. Do not wait for construction to finish in order to start rehabilitation. ➤ Excavated material must be stockpiled along the trench within the working servitude for later backfilling or levelling, and must not be more than 1.5m in height. 	Negligible (4) SP= (M + D + S) × P SP= (2 + 1 + 1) × 1 SP = 4

Potential impact	Impact Significance without Mitigation	Proposed Mitigation Measures	Impact Significance with mitigation
Construction Phase			
		<ul style="list-style-type: none"> ➤ Excavations must not be left open for extended periods and must not be undertaken until such time that all required materials are available on-site. ➤ It is recommended that excavation be carried out along the guidelines given in SANS 1200 (current version). 	
<p>Encroachment of Alien Invasive Plant Species: Uncontrolled construction activities, such as vegetation clearance and excavation are likely to spread and/or exacerbate colonization and establishment of invasive alien species</p>	<p>Medium (40)</p> <p>SP= (M + D + S) × P SP= (4 + 4 + 2) × 4 SP = 40</p>	<ul style="list-style-type: none"> ➤ Prevent large scale clearance, and only clear the areas as demarcated by approved layout. ➤ The control and eradication of invasive plant species must be carried out during and post construction within the project site. ➤ All sites disturbed by construction activities should be monitored for colonization by exotics or invasive plants and be regular removed. 	<p>Negligible (8)</p> <p>SP= (M + D + S) × P SP= (2 + 1 + 1) × 2 SP = 8</p>
<p>Potential loss of wetland habitat: There are no watercourses (stream, wetlands etc.) within 32m and 500m buffer coverage of the proposed site (piggery farm). Uncontrolled construction works within a wetland and aquatic environment is considered highly sensitive.</p>	<p>Negligible (4)</p> <p>SP= (M + D + S) × P SP= (1 + 1 + 2) × 1 SP = 4</p>	<ul style="list-style-type: none"> ➤ The project site servitude must be clearly demarcated to avoid unnecessary disturbances to adjacent areas. ➤ All drainage system must channel to slurry sump. ➤ Unauthorized abstraction of water from water features must be prohibited. 	<p>Negligible (3)</p> <p>SP= (M + D + S) × P SP= (1 + 1 + 1) × 1 SP = 3</p>

Potential impact	Impact Significance without Mitigation	Proposed Mitigation Measures	Impact Significance with mitigation
Construction Phase			
<p>Ground water contamination as a result of:</p> <p>The uncontrolled construction activities may have potential for leaks of hazardous substances from equipment on site. Such hazardous substances have the potential to enter the soil and watercourse systems.</p>	<p>Medium (36)</p> <p>SP= (M + D + S) × P SP= (5 + 2 + 2) × 4 SP = 36</p>	<ul style="list-style-type: none"> ➤ Suitable storage facilities for handling and storage of oils, paints, grease, fuels, chemicals, and any hazardous materials to be used, must be provided to prevent the migration of spillage into the ground and possible ingress into the groundwater regime. ➤ Machinery must be parked on the designated bunded areas and dip trays must be placed under the machinery, when not used to capture any possible oil leaks. ➤ Portable clean-up kits must be available on site to undertake immediate clean-up, should a spill occur. 	<p>Negligible (6)</p> <p>SP= (M + D + S) × P SP= (4+ 1+ 1) × 1 SP = 6</p>
<p>Disturbance of Paleontological and Heritage Resources:</p> <p>Uncontrolled construction activities could result in disturbance of surfaces and/or sub-surfaces which would be destroyed, damaged, altered, or removed from its original position of archaeological and paleontological material or objects. It must be noted that the project is within an existing piggery property. Moreover, the paleontological sensitivity within the area of a development site is very low.</p>	<p>Very-Low (18)</p> <p>SP= (M + D + S) × P SP= (5 + 2 + 2) × 2 SP = 18</p>	<ul style="list-style-type: none"> ➤ Excavation must be limited only to layout site development areas, as approved by project plans and layouts. ➤ Construction vehicles must only use the approved access roads. All construction machinery must be parked at designated areas. ➤ Monitoring must take place during site clearance for possible infant and still-born burials and implement the Chance Finds 	<p>Negligible (5)</p> <p>SP= (M + D + S) × P SP= (3 + 1 + 1) × 1 SP = 5</p>

Potential impact	Impact Significance without Mitigation	Proposed Mitigation Measures	Impact Significance with mitigation
Construction Phase			
		<p>Procedure (CFP) if any such finds are uncovered.</p> <ul style="list-style-type: none"> ➤ Regular Archaeological Watching Briefs should be carried out during construction in case any chance findings are made. ➤ If any human remains, graves, archaeological and historical residues are discovered, the KwaZulu-Natal Amafa and Research Institute Act (5/2018) and the National Heritage Resources Act, No 25 of 1999. requires that operations should cease immediately pending an evaluation by the relevant heritage authorities. 	
<p>Air pollution, dust and emissions: Dust could be generated during construction as a result of earthworks and stockpiles.</p>	<p style="text-align: center;">Medium (24)</p> <p style="text-align: center;">SP= (M + D + S) × P SP= (5 + 1 + 2) × 3 SP = 24</p>	<ul style="list-style-type: none"> ➤ Apply dust suppression to exposed soil and stockpiles. All transported and stored fine product must be covered to prevent spills and been blown by wind. ➤ Excavated material is to be stockpiled along the trench within the working servitude for later backfilling, of not more than 1.5m in height. 	<p style="text-align: center;">Negligible (6)</p> <p style="text-align: center;">SP= (M + D + S) × P SP= (3 + 1 + 2) × 1 SP =6</p>
<p>Aesthetic / visual Impact: The viewshed area and zone of visual influence for the proposed expansion of piggery p is considered</p>	<p style="text-align: center;">Very Low (12)</p>	<ul style="list-style-type: none"> ➤ Concentrate the construction activity and temporary infrastructure in a designated place. In this regard the site camp, must be constructed close enough to the construction 	<p style="text-align: center;">Negligible (4)</p>

Potential impact	Impact Significance without Mitigation	Proposed Mitigation Measures	Impact Significance with mitigation
Construction Phase			
<p>“low visibility” as it will streamline with existing farm facilities.</p>	<p>SP= (M + D + S) × P SP= (3 + 1 + 2) × 2 SP = 12</p>	<p>area to avoid high visibility of construction activities.</p> <ul style="list-style-type: none"> ➤ The contractor should maintain good housekeeping on-site to minimise waste generation and avoid litter. ➤ Dust suppression is important to reduce the visibility of the development. ➤ Excavated material is to be stockpiled along the trench within the working servitude for later backfilling, of not more than 2m in height. ➤ Avoid the use of floodlight at site camp. Also, the light must not face the neighboring homesteads and oncoming traffic on the rural access roads. 	<p>SP= (M + D + S) × P SP= (1+ 1 + 2) × 1 SP = 4</p>
<p>Noise pollution: The main sources of noise associated with the proposed construction activities include the following: construction activities and equipment delivery. Construction activities are likely to be confined to daytime and the noise levels will only affect the adjacent areas for a relatively short period of time.</p>	<p style="text-align: center;">Medium (40)</p> <p>SP= (M + D + S) × P SP= (5 + 1 + 2) × 5 SP = 40</p>	<ul style="list-style-type: none"> ➤ In recognition of the inherently noisy and temporary nature of construction activities, specify standard construction hours during which the usual fixed noise limits do not apply. ➤ Ensure that operating hours as determined by the EA are adhered to. Where not defined, development must be limited to daylight hours. 	<p style="text-align: center;">Very Low (15)</p> <p>SP= (M + D + S) × P SP= (2+ 1 + 2) × 3 SP = 15</p>

Potential impact	Impact Significance without Mitigation	Proposed Mitigation Measures	Impact Significance with mitigation
Construction Phase			
<p>Waste emanating from construction activities: Uncontrolled waste generated from construction activities such as: general, health care and hazardous wastes are more likely inherited from construction activities.</p>	<p>Medium-High (50)</p> <p>SP= (M + D + S) × P SP= (5 + 2 + 3) × 5 SP = 50</p>	<ul style="list-style-type: none"> ➤ Educate of workers on pollution prevention practices. Training programmes must provide information on material handling and spill prevention and response. ➤ Have sufficient and separate bins for general, medical and hazardous waste disposal by implementing the Integrated Waste Management approach: segregation of waste into separate bins and clearly marked for each waste type. ➤ Refuse must be removed regularly to licensed landfill sites. ➤ Hazardous waste must be stored in a secured waste receptacle and disposed of at a registered waste disposal site. ➤ Adequate sanitary facilities and ablutions on the project site must be provided for all personnel throughout the project area. ➤ All waste manifest and disposal certificates must be kept on record 	<p>Negligible (8)</p> <p>SP= (M + D + S) × P SP= (2 + 1 + 1) × 2 SP = 8</p>

Potential Impacts	Impact Significance without Mitigation	Proposed Mitigation Measures	Impact Significance with mitigation
Operation Phase			
<p>Solid waste emanating from piggery operation: Uncontrolled piggery operation would result in accumulation of solid waste, such as: General waste from various feed packaging, feed spills, feed spoilages and domestic waste.</p>	<p style="text-align: center;">High (60)</p> <p style="text-align: center;">SP= (M + D + S) × P SP= (5 + 5 + 2) × 5 SP = 60</p>	<ul style="list-style-type: none"> ➤ Implement the integrated waste management plan (Separate waste containers to promote recycling and re-use) ➤ All feeds packaging such hessian sacks, nylon sacks, polypropylene bags must be re-used to store the supplies feed and feed spills. ➤ All packaging such as thick paper must be recycled. ➤ The feed must be stored on top of pallets in well ventilated shed to prevent crusting and spoilage 	<p style="text-align: center;">Negligible (10)</p> <p style="text-align: center;">SP= (M + D + S) × P SP= (3 + 1 + 1) × 2 SP =10</p>
<p>Effluent waste emanating from piggery operation: Uncontrolled piggery operation would result in accumulation of effluent, such as slurry within the piggery facilities and farm vicinity.</p>	<p style="text-align: center;">High (60)</p> <p style="text-align: center;">SP= (M + D + S) × P SP= (5 + 5 + 2) × 5 SP = 60</p>	<ul style="list-style-type: none"> ➤ Engineering design and good construction practice to mitigate the impact slurry accumulation within the piggery facilities and farm vicinity. ➤ To ensure that no slurry is accumulated within the piggery facilities, the flooring of piggery facilities must comprise the: PVC flooring and fibre support beams for weaner units; PVC, Cast iron slats and support beams for farrowing units; and concrete slat for boars, dry sows and grower units (as per design). 	<p style="text-align: center;">Very-Low (15)</p> <p style="text-align: center;">SP= (M + D + S) × P SP= (3 + 1 + 1) × 3 SP = 15</p>

		<ul style="list-style-type: none"> ➤ Adequate slurry drainage system and collection chambers to flush the slurry away from the piggery facilities into the slurry sump. ➤ Flush the drainage system every two weeks interval. ➤ Always avoid the overflowing of slurry sump by regular removing slurry for use as manure. ➤ Slurry must be temporary stored into a slurry sump, and later be sucked and directly delivered to other farms as wet manure for crop productions. 	
<p>Animal carcasses waste: For every livestock farming, there will be sometimes mortality.</p>	<p style="text-align: center;">Medium-High (55)</p> <p style="text-align: center;">SP= (M + D + S) × P SP= (5 + 5 + 1) × 5 SP = 55</p>	<ul style="list-style-type: none"> ➤ Closely manage the pre-weaning facilities to ensure the facility is warn and not damp to mitigate the pre-weaning mortality, and to have a stockperson present during farrowing ➤ Investigate the morbidity and mortality using the local registered veterinarian ➤ Disposed carcasses by digging and burying them in order to safely decompose naturally. 	<p style="text-align: center;">Very-Low (15)</p> <p style="text-align: center;">SP= (M + D + S) × P SP= (3 + 1 + 1) × 3 SP = 15</p>
<p>Nuisance, environmental health and ambient odour emanating from piggery operation: Piggery farming is largely associated with nuisance and ambient odour issues. Uncontrolled piggery operation would result in nuisance and poor ambient air quality. However, the Facility for Amandla Power Agri Piggery is within remote farming environment,</p>	<p style="text-align: center;">High (60)</p> <p style="text-align: center;">SP= (M + D + S) × P SP= (5 + 5 + 2) × 5 SP = 60</p>	<ul style="list-style-type: none"> ➤ Must use latest piggery facility designs and technological developments (e.g. in regard to housing (holding) facilities, manure storage and treatment systems) and management practices (e.g. altering feed composition and manure spreading practices) to help ease the environmental health aspects associated with pig production. 	<p style="text-align: center;">Very-Low (15)</p> <p style="text-align: center;">SP= (M + D + S) × P SP= (3 + 1 + 1) × 3 SP = 15</p>

<p>whereby there are sparsely distributed residential units in farm dwellings.</p>		<ul style="list-style-type: none"> ➤ Adequate slurry drainage system and collection chambers to flush the slurry away from the piggery facilities into the slurry sump. ➤ Flush the drainage system every two weeks interval ➤ The slurry drainage system must be maintained and serviced regularly to prevent clogging and spillages. ➤ Disinfect the piggery facilities using an environmental friendly livestock disinfectant such as Virogon disinfectant. ➤ Wash the piggery facility with bacterial disinfectant detergent at every production cycle, and disinfect before new production cycle. 	
<p>Ground water pollution as a result of piggery operations: Uncontrolled piggery operation would result in ground water pollution as a result of seepage of slurry as an effluent waste within the farm vicinity.</p>	<p style="text-align: center;">Medium (40)</p> <p>SP= (M + D + S) × P SP= (5 + 3 + 2) × 4 SP = 40</p>	<ul style="list-style-type: none"> ➤ Adequate slurry drainage system and collection chambers to flush the slurry away from the piggery facilities into the slurry sump. ➤ The slurry sump must be concrete lined ➤ Always avoid the overflowing of slurry sump by regular removing slurry for use as manure. 	<p style="text-align: center;">Negligible (5)</p> <p>SP= (M + D + S) × P SP= (3 + 1 + 1) × 1 SP = 5</p>
<p>Overall Mean significance: Nature of a project without mitigation</p>	<p style="text-align: center;">Medium-High (50)</p>	<p>Nature of a project post mitigation</p>	<p style="text-align: center;">Very-Low (13)</p>

16 CUMULATIVE IMPACT ASSESSMENT AND MITIGATION MEASURES

In terms of the EIA Regulations, the cumulative impact is considered from the holistic point of view. It means that the impacts of an activity are considered from the past, present and foreseeable future, together with the impact of activities associated with that activity. The activity itself may not be significant, but when combined with the existing and reasonably foreseeable impacts eventuating from similar or diverse activities may result in a significant change. “Cumulative impacts can be: additive, synergistic, time crowding, neutralizing and space crowding” (DEAT, 2004b;14).

Table 8: Cumulative Impacts

Impact	Description	Mitigation
<p>Nuisance, environmental health and ambient odour emanating from piggery operation:</p>	<p>Expansion of piggery farming is largely associated with nuisance and ambient air quality issues. Uncontrolled piggery operation would result in nuisance and poor ambient air quality.</p>	<p>Must use latest piggery facility designs and technological developments (e.g. in regard to housing (holding) facilities, manure storage and treatment systems, and) and management practices (e.g. altering feed composition and manure spreading practices) to help ease the environmental health aspects associated with pig production.</p> <p>Adequate slurry drainage system and collection chambers to flush the slurry away from the piggery facilities into the slurry sump.</p> <p>Flush the drainage system every two weeks interval.</p> <p>The slurry drainage system must be maintained and serviced regularly to prevent clogging and spillages.</p> <p>Disinfect the piggery facilities using an environmentally friendly livestock disinfectant such as Virogon disinfectant.</p>

Impact	Description	Mitigation
		Wash the piggery facility with bacterial disinfectant detergent at every production cycle, and disinfect before new production cycle.
Effluent waste emanating from piggery operation:	Piggery operation would result in accumulation of effluent, such as slurry within the piggery facilities and farm vicinity	<p>Adequate slurry drainage system and collection chambers to flush the slurry away from the piggery facilities into the slurry sump.</p> <p>Flush the drainage system every two weeks interval.</p> <p>Always avoid the overflowing of slurry sump by regular removing slurry for use as manure.</p> <p>Slurry must be temporary stored into a slurry sump, and later sucked by a tractor honey sucker and directly delivered to local farms as wet manure for crop productions.</p>

17 RECOMMENDATIONS FROM THE ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

The planned activities will sustain Amandla Power Agri Piggery to meet the market demand, also the local community will benefit through employment opportunities. This will ensure that the Sustainable Development Goal 6 and the NDP objectives are realised through this project, the National Web-Based Environmental Screening Tool (NWBEST) was used to generate the environmental sensitivity report of the proposed development site. Additionally, an Initial Site Sensitivity Verification study was undertaken to confirm or dispute the environmental sensitivity as identified by the NWBEST was conducted.

The EAP is of the view that the Environmental Authorization should be granted on certain conditions that are outlined in this section. After an Authorization has been granted, it is the applicants' responsibility to ensure that all recommendations outlined in this report as well as in the EMPr are properly implemented.

17.1 Construction phase

The EAP recommends the authorization of this application. However, the following conditions and mitigation measures are recommended and should be considered in any authorization that may be granted by the competent authority in respect of the application.

17.1.1 Erosion and run-off control

Uncontrolled clearance and excavation during construction likely cause erosion and run-off.

- a) No clearance and excavation must be done outside site boundary servitude. The site clearance and excavation carried within the farm boundary must be limited to development area (construction facilities) as approved by project layout plans. Also, make use of natural erosion suppressors such as progressive rehabilitation using good grassland cover. Do not wait for construction to finish in order to start rehabilitation.
- b) Where necessary during construction construct storm water system and make provision for erosion protection.
- c) Excavations must not be left open for a long duration and must not be undertaken until such time that all required materials are available on-site.

17.1.2 Preventing the ground water pollution

The improper handling of hydrocarbons and other hazardous chemical for purpose of construction activities might have impact in ground and surface water quality.

- a) Spillages of fuels, oils and other potentially harmful chemicals must be cleaned up immediately and contaminants properly drained and disposed of using suitable licensed solid/hazardous waste facilities (not to be disposed of within the natural environment). Any contaminated soil must be removed, and the affected area rehabilitated immediately. A spill response plan must be drafted and communicated to all onsite staff in this regard;

- b) Fuel must be stored in a bunded structure with a roof. The bund must be able to contain at least 110% of the volumes of fuel;
- c) Mixing and/or decanting of all chemicals and hazardous substances must take place on a tray, shutter boards or on an impermeable surface;
- d) Drip trays should be utilised at all dispensing areas;
- e) A chemical spill kit must be present onsite at all times and once used it must be disposed of at a registered hazardous landfill site;

17.1.3 Other recommendations for considerations during construction phase

The following conditions and mitigation measures are recommended and should also be considered in any authorization that may be granted by the competent authority in respect of the application, namely:

- a) Construction boundary must be demarcated and vegetation clearing and top soil removal limited to these areas;
- b) The development area must be surveyed prior to construction for identification of plant SCC and relocate them.
- c) The development area must again be surveyed prior to construction in order to locate and capture any animal SCC and relocate them.
- d) Excavations must not be left open for an extended period, and must not be undertaken until such time that all required materials are available on-site, to facilitate immediate laying of the construction of subsurface infrastructure;
- e) Excavated material (not more than 1.5m in height) is to be stockpiled along the trench within the working servitude for later backfilling,
- f) All stockpiles must be kept free of weeds and invasive alien plants;
- g) Educate of workers on pollution prevention practices. Training programmes must provide information on material handling and spill prevention and response.
- h) Have sufficient and separate bins for general, medical and hazardous waste disposal by implementing the Integrated Waste Management approach: segregation of waste into separate bins and clearly marked for each waste type.
- i) Refuse must be removed regularly to licensed landfill sites.

- j) Hazardous waste must be stored in a secured waste receptacle and disposed of at a registered waste disposal site.
- k) Monitoring must take place during site clearance for possible infant and still-born burials and implement the Chance Finds Procedure (CFP) if any such finds are uncovered.
- l) If any human remains, graves, archaeological and historical residues are discovered, the KwaZulu-Natal Amafa and Research Institute Act (5/2018) and the National Heritage Resources Act, No 25 of 1999. requires that operations should cease immediately pending an evaluation by the relevant heritage authorities.
- m) Regular Archaeological Watching Briefs should be carried out during construction in case any chance findings are made.
- n) The local community must take priority when it comes to employment and all skills that can be sourced from the local communities. Additionally, locals must be given the opportunity to participate in the development and only specialized skills must be sourced from outside of the surrounding communities;
- o) All reasonable precautions must be taken to minimize noise generated on-site.
- p) Construction vehicles and machinery must be kept in good working order so as not to generate excessive noise levels;
- q) Storage areas must be managed properly by applying the suggested mitigation measures recommended in this document;

17.1.4 Site Rehabilitation

The following conditions and mitigation measures are recommended for site rehabilitation, namely:

- a) Only indigenous plants which are able to establish easily and will need less maintenance because they have already adapted to the local conditions should be considered for re-vegetation should be used during rehabilitation, and rehabilitation success should be monitored;
- b) Progressively removal alien plant species;
- c) Fully rehabilitate all disturbed areas and protect them from erosion
- d) Mechanical control methods such as digging, hoeing, pulling out of weeds and invasive plants are recommended.

17.2 Operation and maintenance

The EAP recommends the authorization of this application. However, the following conditions and mitigation measures during operation and maintenance are recommended and should be considered in any authorization that may be granted by the competent authority in respect of the application.

17.2.1 Solid waste management

The piggery operation would result in accumulation of solid waste, such as: General waste from various feed packaging, feed spills, feed spoilages and domestic waste. The following conditions and mitigation measures are recommended for site rehabilitation, namely:

- a) Implement the integrated waste management plan (Separate waste containers to promote recycling and re-use)
- b) All feeds packaging such hessian sacks, nylon sacks, polypropylene bags must be re-used to store the supplies feed and feed spills.
- c) All packaging such as thick paper must be recycled.
- d) The feed must be stored on top of pallets in well ventilated shed to prevent crusting and spoilage.
- e) Disposed carcasses by digging and burying them in order to safely decompose naturally.

17.2.2 Effluent waste management

The piggery operation would result in accumulation of effluent, such as slurry within the piggery facilities and farm vicinity. The following conditions and mitigation measures are recommended for site rehabilitation, namely:

- a) Always ensure that no slurry is accumulated within the piggery facilities.
- b) Adequate slurry drainage system and collection chambers to flush the slurry away from the piggery facilities into the slurry sump.
- c) Flush the drainage system every two weeks interval.
- d) Always avoid the overflowing of slurry sump by regular removing slurry for use as manure.

- e) Slurry must be temporary stored into a slurry sump, later sucked by a tractor honey sucker and delivered to other farms as wet manure for crop productions.

17.2.3 Mitigating nuisance, environmental health and ambient odour

The piggery operation is largely associated with nuisance and ambient air quality issues. The following conditions and mitigation measures are recommended for site rehabilitation, namely:

- a) Adequate slurry drainage system and collection chambers to flush the slurry away from the piggery facilities into the slurry sump.
- b) Flush the drainage system every two weeks interval
- c) The slurry drainage system must be maintained and serviced regularly to prevent clogging and spillages.
- d) Disinfect the piggery facilities using an environmentally friendly livestock disinfectant, such as Virogon disinfectant.
- e) Wash the piggery facility with bacterial disinfectant detergent at every production cycle, and disinfect before new production cycle.

17.2.4 Mitigating the ground water pollution

The piggery operation would result in ground water pollution as a result of seepage of slurry as an effluent waste within the farm vicinity. The following conditions and mitigation measures are recommended for site rehabilitation, namely:

- a) Adequate slurry drainage system and collection chambers to flush the slurry away from the piggery facilities into the slurry sump.
- b) The slurry sump must be concrete lined to prevent leachate and seepage of effluent.
- c) Always avoid the overflowing of slurry sump by regular removing slurry for use as manure.

18 CONCLUSION

The decision to grant or refuse authorisation in terms of Section 24 of NEMA must be made in the light of the provisions of NEMA. Section 24 provides that, in order to give effect to the general objectives of integrated environmental management laid down in NEMA, the potential

impact on the environment of listed activities must be considered, investigated, assessed and reported on to the Competent Authority charged by the Act with deciding applications for environmental authorisation. A Basic Assessment Report (BAR) concerning the impact of the proposed activity and alternative activity options on the environment, has been compiled and submitted as prescribed and authorisation may only be issued after consideration of such report.

We submit that the environmental process undertaken thus far complies with these requirements and that this report covers the full suite of potential environmental issues related to the proposed development. All potential impacts have been evaluated and responded to by either complete avoidance where possible, or by recommendation of the most appropriate and feasible mitigation measures. The preferred/mitigated development proposal presented in this report is responsive to the integrated results of the assessment of potential impacts made by the various specialists on the project team.

Based on comparative evaluation of the various alternatives, including the No-Go option, it is evident that the preferred “Site Layout and Design Alternatives” for the proposed expansion of Amandla Power Piggery can meet the required objections to offset the No-Go option (subject to the implementation of recommended development mitigation measures). This Draft BAR (DBAR) therefore, concludes that the proposed development has been considered via a balanced approach, mindful of cumulative impacts, need and desirability of the project and that the overall negative environmental impacts will be of very low significance. As such, the project can be considered for environmental authorisation subject to implementation of the recommended phased approach and specialist mitigation measures as specified in the EMPr.

This DBAR is available for a review and comment period of 30 days, extending from **9th of September 2021 to the 14th of October 2021**. Comments and submissions received in response to this report will be submitted to the competent authority.

Written submissions must be addressed to:

Emvelo Quality and Environmental Consultant (Pty) Ltd

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19 REFERENCES

Climate-Data.Org. Vryheid Climate. [Access at: <https://en.climate-data.org/africa/south-africa/kwazulu-natal/vryheid-26543/#climate-graph> . Dated 26 August 2021].

DEAT (2002) Stakeholder Engagement, Integrated Environmental Management, Information Series 3, Department of Environmental Affairs and Tourism (DEAT), Pretoria.

DEAT (2002) Specialist Studies, Information Series 4, Department of Environmental Affairs and Tourism (DEAT), Pretoria.

DEAT (2004a) Criteria for determining Alternatives in EIA, Integrated Environmental Management, Information Series 11, Department of Environmental Affairs and Tourism (DEAT), Pretoria.

DEAT (2004b) Cumulative Effects Assessment, Integrated Environmental Management, Information Series 7, Department of Environmental Affairs and Tourism (DEAT), Pretoria.

DEAT (2006) Guideline 5: Assessment of Alternatives and Impacts in support of the Environmental Impact Assessment Regulations, 2006. Integrated Environmental Management Guideline Series, Department of Environmental Affairs and Tourism (DEAT), Pretoria.

Ezemvelo KZN Wildlife (2015). Zululand Biodiversity Sector Plan, V2.0, Unpublished Report of Ezemvelo KZN Wildlife, Biodiversity Conservation Planning Division, Ezemvelo KZN Wildlife, P. O. Box 13053, Cascades, Pietermaritzburg.

FitzPatrick Institute of African Ornithology (2019). BirdPix Virtual Museum. Summary information for locus 2730BC. [Accessed at: http://vmus.adu.org.za/vm_summary.php Dated: 12 August 2021].

FitzPatrick Institute of African Ornithology (2019). FrogMAP Virtual Museum. Summary information for locus 2730DB. [Accessed at: <http://vmus.adu.org.za/?vm=FrogMAP> . Dated 12 August 2021].

FitzPatrick Institute of African Ornithology (2019). LepiMAP Virtual Museum. Summary information for locus 2730DB. [Accessed at: <http://vmus.adu.org.za/?vm=FrogMAP> . Dated 12 August 2021].

FitzPatrick Institute of African Ornithology (2019). MammalMAP Virtual Museum. Summary information for locus 2730DB. [Accessed at: <http://vmus.adu.org.za/?vm=MammalMAP> . Dated 12 August 2021].

FitzPatrick Institute of African Ornithology (2019). ReptileMAP Virtual Museum. Summary information for locus 2730DB. [Accessed at: <http://vmus.adu.org.za/?vm=ReptileMAP> . Dated 12 August 2021].

Mucina, L. and Rutherford, M.C. 2006. The vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19. South African National Biodiversity Institute. Pretoria. pp 349-436.

National Planning Commission (NPC). (2012). National Development Plan 2030. Our Future – make it work. Pretoria, South Africa. [Assessed at: http://www.dac.gov.za/sites/default/files/NDP%202030%20-%20Our%20future%20-%20make%20it%20work_0.pdf Dated: 17 March 2021]

Zululand District Municipality KZN. Profile and analysis. District development model [Access at:https://www.cogta.gov.za/ddm/wpcontent/uploads/2020/08/DistrictProfile_ZULULAND08072020-1.pdf .Dated: 26 August 2021].

20 BIBLIOGRAPHY

BROWNLIE, S., 2005. Guideline for involving biodiversity specialists in EIA processes: Edition 1. CSIR Report No ENV-S-C 2005 053 C. Republic of South Africa, Provincial Government of the Western Cape, Department of Environmental Affairs & Development Planning, Cape Town.

CSIR, 2011. Wetland Freshwater Priority Areas (FEPAs). Council for Scientific and Industrial Research (CSIR), Pretoria.

DEAT (2002) Stakeholder Engagement, Integrated Environmental Management, Information Series 3, Department of Environmental Affairs and Tourism (DEAT), Pretoria.

DEAT (2002) Specialist Studies, Information Series 4, Department of Environmental Affairs and Tourism (DEAT), Pretoria.

DEAT (2010a). Companion to the EIA Regulations 2010. Integrated Environmental Management Guideline Series 5. Department of Environmental Affairs (DEA), Pretoria.

DEAT (2010b). Public Participation 2010. Integrated Environmental Management Guideline Series 7. Department of Environmental Affairs (DEA), Pretoria.

Driver, M. (2005). South Africa's first National Spatial Biodiversity Assessment: conservation news. *Veld & Flora* 91, 11.

Ezemvelo KZN Wildlife (2016). KZN Biodiversity Spatial Planning Terms and Processes, Version 3.3. Unpublished Report, Biodiversity Spatial Planning and Information Division, Ezemvelo KZN Wildlife, P. O. Box 13053, Cascades, Pietermaritzburg, 3202.

Mucina, L. and Rutherford, M.C. (2006). The vegetation of South Africa, Lesotho and Swaziland. *Strelitzia* 19. South African National Biodiversity Institute. Pretoria. pp 349-436.

National Environmental Management Act (107 of 1998): EIA Regulation 2017, as Amended . Department of Environmental Affairs. Pretoria.

Richardson, D.M., Bond, W.J., Dean, W.R.J., Higgins, S.I., Midgley, G., Milton, S.J., Powrie, L.W., Rutherford, M.C., Samways, M., Schulze, R., 2000. Invasive alien species and global change: a South African perspective. *Invasive species in a changing world*, 303-349.

SANBI, 2017. Red List of South African Plants version 2017.1.

Todd S. 2013. Drennan solar energy facility: fauna and flora specialist report for impact assessment. (Accessed from: <https://www.erm.com/> . Dated 14 August 2018)

APPENDICES

APPENDIX A. DECLARATION OF INFORMATION

I, the undersigned Phumzile Lembede, on behalf of **Emvelo Quality and Environmental Consultant**, hereby declare that the information provided in this application is correct and true.

8th September 2021

Signature

Date

Principal EAP

**Emvelo Quality and Environmental
Consultant**

Position

Company

APPENDIX B. ENVIRONMENTAL MANAGEMENT PLAN(EMPR)

APPENDIX C. SITE PHOTOGRAPHS AND LOCALITY MAPS

C-1: Case Images

C-2: Locality Map

APPENDIX D. SITE LAYOUT AND DESIGNS

APPENDIX E. PUBLIC PARTICIPATION PROCESS

E-1: Onsite notices

E-2: Newspaper advert

E-3: PP Plan and Register of I&APs

E-4: I&APs Involvement and Comments

E-5: Background Information Document (BID)

E-6: Minutes of the Pre-Application meeting

APPENDIX F. EAP'S CV(S)

APPENDIX G: SPECIALIST STUDIES

G-1: Motivation for Exclusion of Specialist Studies

APPENDIX H: WEB-BASED ENVIRONMENTAL SCREENING REPORT