WILD TOMORROW FUND

Proposed Construction of a Donor House & Associated Infrastructure, Greater Ukuwela Nature Reserve

Draft Basic Assessment Report (DBAR)

Issue Date: 12 May 2022
Revision no.: 1.0
Project No. 16719
KZN EDTEA Ref No.: DC27/0002/2022: KZN/EIA/0001734/2022

Date:	12 May 2022
Document Title:	16719 Ukuwela Nature Reserve Development: Draft Basic Assessment Report (DBAR)
Revision Number:	1.0
Author:	*Katherine Wiles* *Cert.Nat.Sci Reg No: 300205/15*
Checked by:	*Katherine Wiles* *Cert.Nat.Sci Reg No: 300205/15*
Approved by:	Michelle Nevette *Cert.Nat.Sci Rev No. 120356* *EAPASA Reg No. 2019/1560*
Signature:	
Client:	Wild Tomorrow Fund

Confidentiality Statement

WILD TOMORROW FUND

PROPOSED CONSTRUCTION OF A DONOR HOUSE AND ASSOCIATED INFRASTRUCTURE AT THE GREATER UKUWELA NATURE RESERVE, HLUHLUWE

DRAFT BASIC ASSESSMENT REPORT

TABLE OF CONTENTS

APPENDICES

LIST OF FIGURES

LIST OF TABLES

WILD TOMORROW FUND

PROPOSED CONSTRUCTION OF A DONOR HOUSE AND ASSOCIATED INFRASTRUCTURE AT THE GREATER UKUWELA NATURE RESERVE, HLUHLUWE

DRAFT BASIC ASSESSMENT REPORT

1. INTRODUCTION

Wild Tomorrow Fund are proposing the construction of a donor house and associated infrastructure on the Greater Ukuwela Nature Reserve near Hluhluwe, KwaZulu-Natal Province. The Greater Ukuwela Nature Reserve has been registered as an Ezemvelo KZN Biodiversity Stewardship Site and as such is proclaimed as a Protected Area as defined within the National Environmental Management: Protected Areas Act of 2003 (NEMPAA), as amended.

The proposed development is to include the following components:

- A Donor House with associated Decking, Terraces, Landscaping and Walkways;
- A Managers House;
- Reserve Office and FreeMe Complex;
- Tented Camp; and
- Various internal gravel access roads.

In terms of infrastructure requirements, the following is proposed:

- Potable water provision will be via a municipal source;
- On site sewer treatment will be required (Septic Tank and Soakaway System); and
- Electrical supply will be via Eskom and from a small on-site solar PV plant.

SiVEST Environmental Division has subsequently been appointed as the independent Environmental Assessment Practitioner (EAP) to undertake the Environmental Basic Assessment (BA) Process for the proposed construction of the Donor House and associated infrastructure. The proposed development requires an EA from the Kwa Zulu-Natal Provincial Department of Economic Development, Tourism and Environmental Affairs (EDTEA).

The BA for the proposed development will be conducted in terms of the EIA Regulations, 2014 (as amended) promulgated in terms of Chapter 5 of the NEMA. In terms of these regulations, the proposed development would be subject to a BA process in terms of the NEMA) (as amended) and Appendix 1 of the EIA Regulations, 2014 (as amended).

1.1 Content Requirements for a Basic Assessment Report

A Basic Assessment Report must contain the information that is necessary for the competent authority to consider and come to a decision on the application and must include a proper understanding of the process, informing all preferred alternatives, the scope of the assessment, an assessment of the significant impacts, findings of the specialists and proposed mitigation measures, and the consultation process followed through the BA process. The content requirements for a Basic Assessment Report (as provided in Appendix 1 of the EIA Regulations 2014, as amended), as well as details of which section of the report fulfils these requirements, are shown in **Error! Reference source not found.** below.

Table 1: Content requirements for a Basic Assessment Report SG Codes

2014 EIA Regulations, as amended.	Requirements for Basic Assessment Reports	Location in this Basic Assessment Report
Appendix 1, Section 3 (1)	A basic assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include—	Refer to relevant reference sections below:
Appendix 1, Section 3 (a)	Details of – (i) The EAP who prepared the report; and (ii) The expertise of the EAP, including a curriculum vitae.	Section 4
Appendix 1, Section 3 (b)	The location of the activity, including – (i) The 21-digit Surveyor General code of each cadastral land parcel; (ii) Where available, the physical address and farm name; (iii) Where the required information in items (i) and (ii) is not available, coordinates of the boundary of the property or properties	Section 5
Appendix 1, Section 3 (c)	A plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale, or, if it is – (i) A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) On land where the property has not been defined, the coordinates within which the activity is to be undertaken.	Section 6
Appendix 1, Section 3 (d)	A description of the scope of the proposed activity, including – (i) All listed and specified activities triggered and being applied for; and (ii) A description of the activities to be undertaken, including associated structures and infrastructure.	Section 7
Appendix 1, Section 3 (e)	A description of the policy and legislative context within which the development is proposed including- (i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and have been considered in the preparation of the report; and	Section 11 and 12

2014 EIA Regulations, as amended.	Requirements for Basic Assessment Reports	Location in this Basic Assessment Report
	(ii) How the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments;	
Appendix 1, Section 3 (f)	A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Section 13
Appendix 1, Section 3 (g)	a motivation for the preferred site, activity and technology alternative;	Section 13 and 14
Appendix 1, Section 3 (h)	A full description of the process followed to reach the proposed preferred activity, site and location within the site, including-	Section 14
	(i) Details of all alternatives considered;	Section 14
	(ii) Details of the Public Participation Process undertaken in terms of Regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Section 15
	(iii) A summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	Section 15.2.4
	(iv) The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 9 and 10
	(v) The impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration, and probability of the impacts, including the degree to which the impacts- (aa) Can be reversed; (bb) May cause irreplaceable loss of resources; and (cc) Can be avoided, managed, or mitigated.	Section 16
	(vi) The methodology used in deterring and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;	Appendix G
	(vii) Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographic, physical, biological, social, economic, heritage and cultural aspects;	Section 17
	(viii) The possible mitigation measures that could be applied and level of residual risk;	Section 16 and 17
	(ix) The outcome of the site selection matrix;	Section 16
	(x) If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such and;	Not Applicable
	(xi) A concluding statement indicating the preferred alternatives, including preferred location of the activity.	Section 14, 19 and 21
Appendix 1, Section 3 (i)	A full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including- (i) A description of all environmental issues and risks that were identified during the environmental impact assessment process; and (ii) An assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.	Appendix G and Section 16

2014 EIA Regulations, as amended.	Requirements for Basic Assessment Reports	Location in this Basic Assessment Report
Appendix 1, Section 3 (j)	An assessment of each identified potentially significant impact and risk, including- (i) Cumulative impacts; (ii) The nature, significance and consequences of the impact and risk; (iii) The extent and duration of the impact and risk; (iv) The probability of the impact and risk occurring; (v) The degree to which the impact and risk can be reversed; (vi) The degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) The degree to which the impact and risk can be avoided, managed or mitigated.	Section 16
Appendix 1, Section 3 (k)	Where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report.	Section 18
Appendix 1, Section 3 (l)	An environmental impact statement which contains- (i) A summary of the key findings of the environmental impact assessment; (ii) A map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and (iii) A summary of the positive and negative impacts and risks of the proposed activity and identified alternatives.	Section 19
Appendix 1, Section 3 (m)	Based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management outcomes for the development for inclusion in the EMPr.	Section 20 and Appendix H
Appendix 1, Section 3 (n)	Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation.	None, refer Section 22
Appendix 1, Section 3 (o)	A description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Section 23
Appendix 1, Section 3 (p)	A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation.	Section 21 and Section 22
Appendix 1, Section 3 (q)	Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised.	Section 22 and 24
Appendix 1, Section 3 (r)	An undertaking under oath or affirmation by the EAP in relation to- (i) The correctness of the information provided in the report; (ii) The inclusion of the comments and inputs from stakeholders and interested and affected parties; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties.	Section 25

2014 EIA Regulations, as amended.	Requirements for Basic Assessment Reports	Location in this Basic Assessment Report
Appendix 1, Section 3 (s)	Where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts.	Not Applicable at this stage
Appendix 1, Section 3 (t)	any specific information required by the Competent Authority.	Section 26
Appendix 1, Section 3 (u)	Any other matter required in terms of section 24(4) (a) and (b) of the Act.	None
Appendix 1 Section 3 (2)	Where a government notice gazetted by the Minister provides for the basic assessment process to be followed, the requirements as indicated in such a notice will apply.	Noted and applied with

2. PROJECT TITLE

Proposed Construction of a Donor House and associated infrastructure at the Greater Ukuwela Nature Reserve, Hluhluwe, Big 5 Hlabisa Local Municipality KwaZulu-Natal Province.

3. DETAILS OF APPLICANT

3.1 Name and contact details of the Applicant

Name and contact details of Applicant:

Table 2: Name and contact details of the applicant

Business Name of Applicant	Wild Tomorrow Fund South Africa
Physical Address	Greater Ukuwela Nature Reserve, The Farm Pineapple 16074, Hluhluwe, 3960
Postal Address	PO Box 74085, Lynnwood Ridge
Postal Code	0040
Telephone	+27 83 379 2923
Fax	-
Email	greg@wildtomorrowfund.org

4. DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTTIONER AND SPECIALISTS

4.1 Name and contact details of the Environmental Consultant

The table below provides the name and contact details of the Environmental Consultants who prepared this report:

Table 3: Name and contact details of the Environmental Consultant who prepared the report

Business Name of EAP	SiVEST SA (PTY) Ltd
Physical Address	4 Pencarrow Crescent, La Lucia Ridge Office Estate
Postal Address	PO Box 1899, Umhlanga Rocks
Postal Code	4320
Telephone	031 581 1500
Fax	031 566 2371
Email	katherinew@sivest.co.za

4.2 Names and expertise of the Environmental Assessment Practitioner (EAP)

The table below provides the names of the EAP's who prepared this report:

Table 4: Names and details of the expertise of the EAP's involved in the preparation of this report

Name of representative of the EAP	Educational Qualifications	Professional Affiliations	Exp (years)
Michelle Nevette *(Cert.Sci.Nat.)*	MEnvMgt. (Environmental Management)	SACNASP Reg No. 120356 EAPASA Reg No. 2019/1560 IAIAsa	19
Katherine Wiles (*Cert.Sci.Nat*)	BSc (Geography and Environmental Management)	SACNASP Regi No. 300205/15 IAIAsa	11
Siphiwokuhle Buthelezi	Bachelor of Social Science (Honours) (Geography and Environmental Management)	None	0.4

CV's of SiVEST personnel and EAP Declaration is attached in **Appendix A.**

4.3 Names and expertise of the specialists

The table below provides the names of the specialists involved in the project:

Table 5: Names of specialists involved in the project

Company	Name of representative of the specialist	Specialist	Educational Qualifications	Exp (years)
SiVEST SA (Pty) Ltd	Mark Summers	Ecological Assessment	MSC Ecological Science Pr.Sci.Nat	5
Umlando Consulting	Gavin Anderson	Heritage Assessment	Masters of Philosophy in Archaeological/Social Psychology: 1996, UCT	24
Eco-Assist	Wayne Jackson	Agricultural and Soils Assessment	Bachelor of Science (Soil Science & Hydrology)	12
		Hydro-pedological Assessment		
Dacre James Alletson	Dacre James Alletson	Aquatic Assessment	BSc, BSc (Hons)	50

5. LOCATION OF THE ACTIVITY

The Greater Ukuwela Nature Reserve is approximately 1283,1 hectares and is located just north of Hluhluwe in KwaZulu Natal. It falls within the uMkhanyakude District Municipality and the Big Five Hlabisa Local Municipality.

The reserve comprises of two main portions which are not directly connected to one another; namely Ukuwela (west), which is 540.8 ha, and Mfuleni (east) which is 742.3 ha (**Figure 1**). The Greater Ukuwela Nature Reserve is also located in the centre of the Maputaland-Pondoland-Albany Hotspot, one of the world's biologically richest and most endangered land-based ecoregions. It is surrounded by other reputed nature reserves, including Mkuze, Sodwana Bay, South Africa's first UNESCO World Heritage Site, the iSimangaliso Wetland Park, and the Phinda Private Game Reserve (part of the Mun-Ya Wana Conservancy), with which Ukuwela shares a river border (Mzinene River)(Wild Tomorrow Fund, 2021). The Greater Ukuwela Nature Reserve therefore plays an integral role in further conservation efforts for the area.

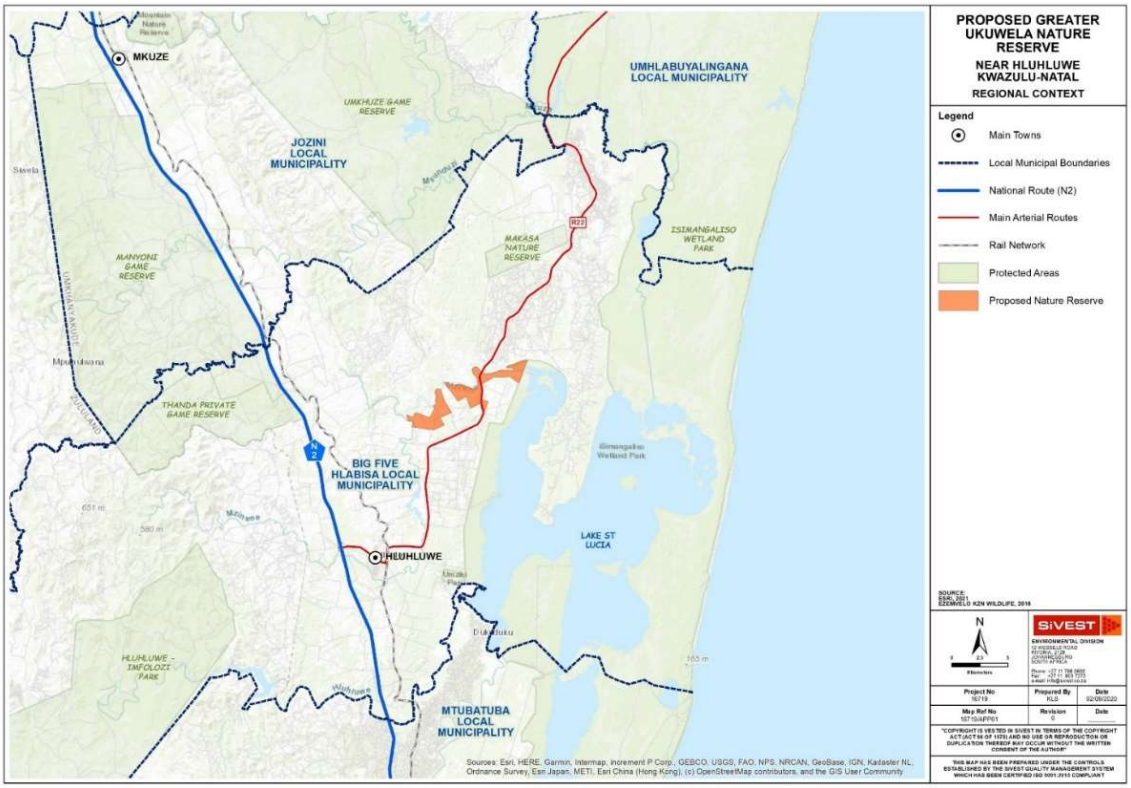

Figure 1: Site locality

5.1 21 Digit Surveyor General Codes of the proposed sites:

Table 6:SG Codes

Description	**21 Digit Code**
Remainder of the Farm Cloete No. 13350	N0HV00000001335000000
The Farm Pineapple No 16074	N0HV00000001607400000

Description	21 Digit Code
Portion 12 of the Farm Cloete No. 13350 RE/23/13180	N0HV00000001335000012
Portion 13 of the Farm Cloete No. 13350 RE/23/13180	N0HV00000001335000013
Portion 14 of the Farm Cloete No. 13350 RE/23/13180	N0HV00000001335000014
Portion 59 of the Farm Cloete No. 13350 RE/23/13180	N0HV00000001335000059
Portion 37 (of 15) of Farm Msinene Estate Number 14137	N0HV00000001413700037
Portion 38 (of 15) of Farm Msinene Estate Number 14137	N0HV00000001413700038
Portion 39 (of 15) of Farm Msinene Estate Number 14137	N0HV00000001413700039

5.2 Coordinates of the site

The coordinates for the sites are as follows. A greater area has however been assessed to allow for final design amendments (if required).

Proposed Donor House:

	Latitude /Longitude	Degrees	Minutes	Seconds
Corner Point 1	**South**	27°	54’	0.22”S
	East	32°	19’	34.05”E
Corner Point 2	**South**	27°	53’	56.68”S
	East	32°	19’	37.08”E
Corner Point 3	**South**	27°	54’	0.63”S
	East	32°	19’	40.14”E
Corner Point 4	**South**	27°	54’	2.40”S
	East	32°	19’	37.69”E

Managers House:

	Latitude /Longitude	Degrees	Minutes	Seconds
Corner Point 1	**South**	27°	54’	51.10”S
	East	32°	18’	51.85”E
Corner Point 2	**South**	27°	54’	50.48”S
	East	32°	18’	52.64”E
Corner Point 3	**South**	27°	54’	51.11”S
	East	32°	18’	53.06”E
Corner Point 4	**South**	27°	54’	51.66”S
	East	32°	18’	52.23”E

Reserve Office and FreeMe Complex

	Latitude /Longitude	Degrees	Minutes	Seconds
Corner Point 1	**South**	27°	53’	31.95”S
	East	32°	22’	0.16”E
Corner Point 2	**South**	27°	53’	34.72”S
	East	32°	22’	11.50”E
Corner Point 3	**South**	27°	53’	41.95”S
	East	32°	22’	8.95”E
Corner Point 4	**South**	27°	53’	38.85”S
	East	32°	21’	57.75”E

Tented Camp

	Latitude /Longitude	Degrees	Minutes	Seconds
Building 1 (centre point)	**South**	27°	53’	12.25”S
	East	32°	21’	31.15”E
Building 2 (centre point)	**South**	27°	53’	13.83”S
	East	32°	21’	33.22”E
Tent 1	**South**	27°	53’	16.97”S
	East	32°	21’	33.07”E
Tent 2	**South**	27°	53’	15.57”S
	East	32°	21’	33.14”E
Tent 3	**South**	27°	53’	15.01”S
	East	32°	21’	34.13”E
Tent 4	**South**	27°	53’	15.23”S
	East	32°	21’	35.41”E
Tent 5	**South**	27°	53’	15.14”S
	East	32°	21’	36.66”E
Tent 6	**South**	27°	53’	14.44”S
	East	32°	21’	37.59”E
Tent 7	**South**	27°	53’	14.99”S
	East	32°	21’	38.59”E
Tent 8	**South**	27°	53’	15.99”S
	East	32°	21’	38.97”E

Various internal access roads

	Start	Middle	End
Donor House Access Road	27°54'5.35"S 32°19'31.59"E	27°54'6.05"S 32°19'36.53"E	27°54'1.42"S 32°19'36.42"E
Free Me Access Road	27°53'51.53"S 32°21'53.67"E	27°53'48.79"S 32°22'1.42"E	27°53'40.71"S 32°22'4.42"E
Tented Camp Access Road 1	27°53'21.30"S 32°21'32.96"E	27°53'14.97"S 32°21'33.30"E	27°53'10.80"S 32°21'29.99"E
Tented Camp Access Road 1	27°53'15.82"S 32°21'42.79"E	27°53'14.97"S 32°21'33.30"E	27°53'10.80"S 32°21'29.99"E

6. SITE LAYOUT PLANS

The Site Master Layout Plans are attached in **Appendix C**.

Photographs of the site are included in **Appendix D**.

7. ACTIVITY INFORMATION

Portions of the Greater Ukuwela Nature Reserve have previously been commercially farmed since the 1950s; with a combination of both crop and beef production. The Mfuleni portion of the site is predominantly primary vegetation (wetland habitat), with small patches that were utilised for farming. The entire area is now currently being used for conservation and ecotourism ventures; therefore, the area is in the process of being rehabilitated.

The existing infrastructure found within the Greater Ukuwela Nature Reserve is therefore primarily related to the continued management of the reserve, the operation of ecotourism ventures and residential purposes and includes the following (not limited to):

- A perimeter fence and access gates. The permitter fence is 1.8m heavy galvanized, electrified Veldspan or Bonnox game fence. The electrics are run off solar power;
- An internal road network (access to the sites and internal management tracks/game viewing tracks);
- Anti-poaching camps; and
- Residential houses.

7.1 Project Description

Wild Tomorrow Fund are proposing the construction of a donor house, management house, tented camp, associated small gravel access roads and in conjunction with FreeMe, a rehabilitation facility.

- The Donor house site is approximately 1.57 hectares in extent (15 709 m^2)
- The FreeMe site is approximately 7.4 hectares in extent (74 000 m^2)
- The Manager's house is approximately 0.1 hectares (61m^2)
- Tented Camp:
  - Building 1: approximately 114m^2
  - Building 2: approximately: 1200m^2
  - Approximate size of tents: 60 – 80m^2

Note the entire sites mentioned above will not be cleared.

Further details of the proposed bulk infrastructure to support the donor house, tented camp and FreeMe facility is elaborated on below.

7.1.1 Roads

Various internal access roads are proposed to access the various infrastructure proposed. There are existing registered access roads to all the properties within the Greater Ukuwela Nature Reserve and internal game viewing tracks etc. The access roads will have the following approximate dimensions:

- Tented Camp access roads will be approximately 1km long with a servitude not larger than 4m;
- FreeMe access road will be approximately 550m long and not wider than 4m.
- Donor House access road will be approximately 400m long and not wider than 4m.

There are no new additional roads proposed other than the ones provided to access the donor house, free me site and the tented camp.

7.1.2 Water

A water pipeline runs through the Ukuwela Nature Reserve (Farm Pineapple 16074) to Mun-Ya-Wana Conservancy; however, this is not a registered servitude.

Potable water will be sourced by connecting the various developments to the main municipal line. These will be small PVC pipelines with a 50m diameter The length of the water pipelines is as follows:

- Donor house: approx. 950 m;
- Management house: approx. 50 m; and
- Tented camp: approx. 140 m.

7.1.3 Sanitation

The developer has proposed to utilise a septic tank system at the Managers house, the donor house and the tented camp. The sewage tank treats wastewater at the location rather than removing it to sewer system.

The size of the septic tanks is as follows:

- Donor house: minimum 6600 litres at minimum surface area of 4 square metres;
- Volunteer camp: as above; and
- Management house: minimum 3000 litres at minimum surface area of 2.5 square metres.

7.1.4 Electricity

The developer hopes to use small Solar PV Panels to provide electricity to the various development components. The output will be under the BA thresholds. The small solar plant will have a mechanical room with a battery & generator. The panels will be perched up on a steel structure with the correct orientation to the sun, not higher than the trees.

7.2 NEMA Listed Activities

The amended EIA Regulations promulgated under Section 24(5) of the National Environmental Management Act, Act 107 of 1998 and published in Government Notice No. R. 326 list activities which may not commence without environmental authorization from the Competent Authority. The proposed activity is identified in terms of Government Notice No. R. 327 and 324 for activities which must follow a BA Process. The project will trigger the following listed activities:

Table 7: Listed activities in terms of NEMA: EIA Regulations 2014 (as amended in 2017), applicable to the proposed project

Listing Notice	Activity	Applicability
GNR 327, April 2017 (Listing Notice 1): Activity 27	The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for— (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	With all the areas to be cleared for the roads, donor house, tented camp and free me complex it is anticipated that more than 1 hectare will be cleared.
GNR 324, April 2017 (Listing Notice 3): Activity 6	The development of resorts, lodges, hotels, tourism or hospitality facilities that sleeps 15 people or more. d. KwaZulu-Natal …	This listed activity will be triggered where the facilities will be utilised for hospitality or tourism

Listing Notice	Activity	Applicability
	i. A protected area identified in terms of the NEMPAA; ii. Outside urban areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any terrestrial protected area identified in terms of NEMPAA or from the core area of a biosphere reserve; … v. Biodiversity Stewardship Programme Biodiversity Agreement areas; … ix. A protected area identified in terms of NEMPAA, excluding conservancies; … xiii. Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose;	purposes particularly the Tented Camp.
GNR 324, April 2017 (Listing Notice 3): Activity 12	Activity 12 The clearance of an area of 300 square metres or more of indigenous vegetation within… d. KwaZulu-Natal … iii. Biodiversity Stewardship Programme Biodiversity Agreement areas; … vii. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning; viii. A protected area identified in terms of NEMPAA, excluding conservancies; … xi. Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose;	This listed activity will be triggered as the reserve is registered as an Ezemvelo KZN Wildlife Stewardship site according to the information provided by the client. As such the transformation of more than 300m^2 of indigenous vegetation on the properties will trigger this listed activity.

8. NATIONAL WEB BASED ENVIRONMENTAL SCREENING TOOL

The National Web based Environmental Screening Tool is a geographically based web-enabled application which allows a proponent intending to apply for environmental authorisation in terms of the Environmental Impact Assessment (EIA) Regulations 2014, as amended, to screen their proposed site for any environmental sensitivity.

From the Screening Tool assessment, the following is noted with regards to the proposed development site:

- The site does not intersect with any Environmental Management Framework (EMF) areas.
- The site falls within a Strategic Transmission Corridor, namely the Expanded Eastern Corridor. However, since the proposed activity is not for environmental authorisation for large scale wind and solar photovoltaic which occur in geographical areas of strategic importance, there is no further assessment required in this regard.
- The site falls within a Strategic Gas Transmission Pipeline Corridor, namely the Phase 4 Corridor from Mozambique (Southern Border) to Richards Bay. However, since the proposed activity is not for the planning of gas pipeline infrastructure which occur in geographical areas of strategic importance, there is no further assessment required in this regard.
- The site is a South African Protected Area.

According to the DFFE Screening Tool Reports[1] (attached in **Appendix J**), the following themes described in **Table 8** below are applicable to the proposed development:

Table 8: DFFE Screening tool themes

Theme	Sensitivity			Comment
	Property 1: FreeMe Complex	**Property 2: Tented Camp**	**Property 3: Donor and Managers House**	
Agriculture Theme	Very High	Very High	Very High	An Agricultural and Soils Assessment is included in **Appendix F1** of the Draft Basic Assessment Report.
Animal Species Theme	High	High	High	The Terrestrial Ecological Report is included in **Appendix F5** of the Draft Basic Assessment Report. Parts of the site are mapped as High sensitivity due to the presence of various avifauna. The overall area is transformed but is recovering from many

[1] Note the DFFE Screening Tool does not allow consecutive properties to be assessed in one Screening Assessment. Therefore, each of the three properties was assessed separately and a separate DFFE Screening Tool Report was generated for each.

Theme	Sensitivity			Comment
	Property 1: FreeMe Complex	Property 2: Tented Camp	Property 3: Donor and Managers House	
				years of farming activities and therefore currently has a medium conservation value. Although species identified in the DFFE Screening Tool may be present on site (including species as per the POC table), the type of construction limits the overall loss in habitat for these species, especially if mitigation measures are implemented. Further to this, species identified in the TSCP Minset dataset mirror that of the DFFE Screening Tool.
Aquatic Biodiversity Theme	Low	Very High	Very High	The Terrestrial Ecological Report and a Wetland/Aquatic Assessment is included in **Appendix F5 and F2** of the Draft Basic Assessment Report. The specialist has confirmed that the site contains areas of very high sensitivity due to the presence of wetlands and estuaries.
Archaeological and Cultural Heritage Theme	Low	Very High	Very High	The Heritage Reports are included in **Appendix F4** of the Draft Basic Assessment Report.
Civil Aviation Theme	High	High	High	The closest airport is used for ecotourism purposes and is within 8km of a small aerodrome, hence the High sensitivity.
Defence Theme	Very High	Very High	Low	The entire site is located close to a defence site. However it is not anticipated that any further specialist study is required.
Palaeontology Theme	Very High	Very High	Very High	The Heritage Report is included in **Appendix F4** of the Draft Basic Assessment Report.

Theme	Sensitivity			Comment
	Property 1: FreeMe Complex	**Property 2: Tented Camp**	**Property 3: Donor and Managers House**	
				The palaeontological desktop assessment has recommended a field assessment prior to construction.
Plant Species Theme	Medium	Medium	Medium	The Terrestrial Ecological Report is included **Appendix F5** of the Draft Basic Assessment Report. No species highlighted in the DFFE Screening tool were identified on site. It must be noted that bulbs may not have been identified due to the sampling season.
Terrestrial Biodiversity Theme	Very High	Very High	Very High	The Terrestrial Ecological Report is included **Appendix F5** of the Draft Basic Assessment Report. The Very High sensitivity is associated with the following: • CBAs, • Greater Ukuwela Nature Reserve • Mun-ya-wana Conservancy • Vulnerable ecosystem • Protected Areas Expansion Strategy

9. DESCRIPTION OF THE RECEIVING ENVIRONMENT

9.1 Climate

Based on the Soils, Land Capability and Land Use Specialist Assessment report compiled by Wayne Jackson (Eco Assist) in September 2021 (**Appendix F of the DBAR**), the climate for the area is mainly summer rainfall with some rain in winter. “The climate is considered to be tropical with the Koppen-Geiger classification being Aw (Tropical savanna climate with dry winter characteristics)”.

Mean Annual Precipitation (MAP) is approximately 550–800 mm. Mist from the warm Indian Ocean contributes to precipitation. No incidence of frost occurs in the area. Mean monthly maximum and minimum temperatures were 39.5°C and 3.1°C for January and July, respectively (Mucina, et al., 2006) (**Figure 2**).

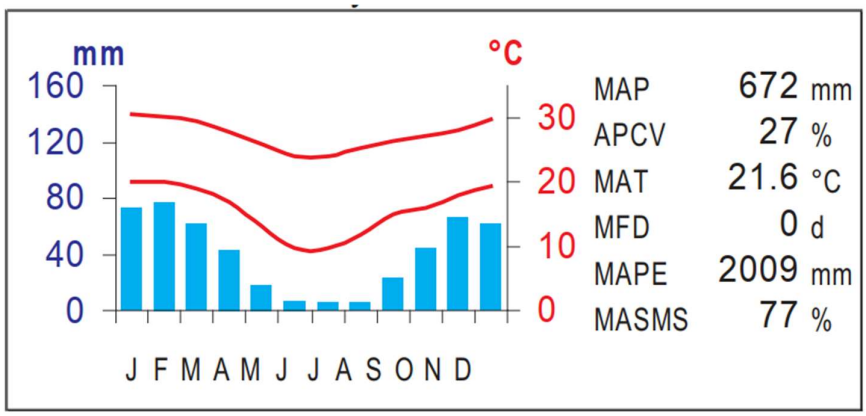

Figure 2: Climate summary for the area (Mucina, et al., 2006).

9.2 Topography

The topography within and in the immediate vicinity of the proposed application site is characterised by mainly flat to gentle slopes, sloping down in a south-easterly direction. Additionally, the area has an altitudinal range of 8 m above sea level on the Mzinene River and approximately 75 m above sea level in the south west of the conservancy.

9.3 Geology and soils

Based on the Soils, Land Capability and Land Use Specialist Assessment report compiled by Wayne Jackson (Eco Assist) in September 2021 (Appendix F of the DBAR), the baseline geology and soils status of the application is described in detail below.

The Reserve is situated on a siltstone band, running north to south. This band is one of the three formations that comprise the Cretaceous sediments; all of which form striking north-south zones parallel to the eastern foot slopes of the Lebombo mountains. (Hilcove *et al*, 2021). According to Mucina and Rutherford, 2006, the study area is underlain by the Cretaceous shallow-marine and coastal sediments, siltstones and conglomerates of the Zululand Group and minor rhyolites of the Jozini Formation (Karoo Supergroup) (**Figure 3** and **Figure 4** below).

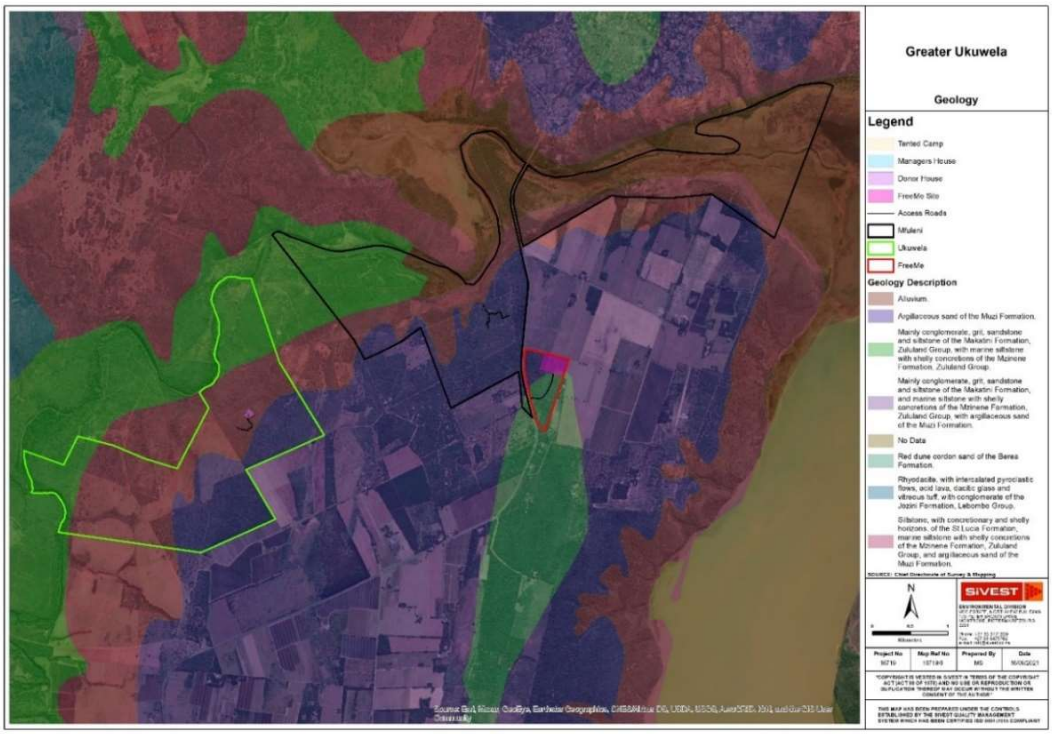

Figure 3: Geology of the study area

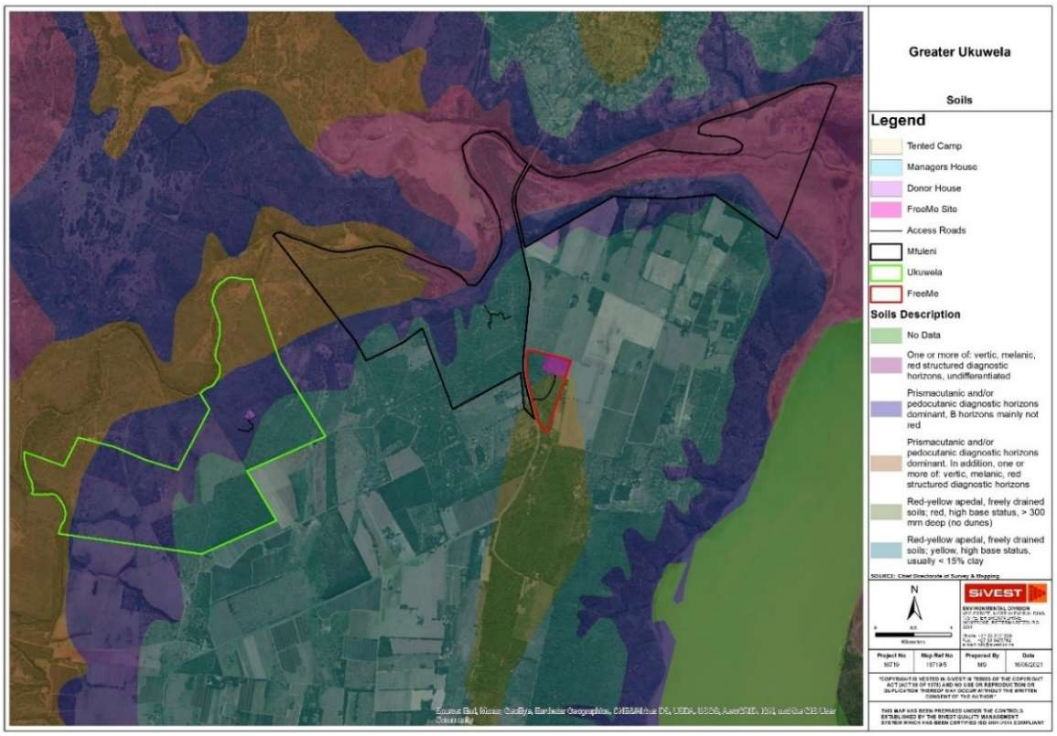

Figure 4: Soils of the study area

9.4 Wetlands

According to Hilcove et al, 2021: "*The Greater Ukuwela Nature Reserve is drained by a number of drainage lines towards the Mzinene River to the north of the reserve, which ultimately flows into the St Lucia Wetland system. Artificial watering points consist of a number of small dams scattered throughout the reserve; only some of which are functional and/or are kept full throughout the year*".

The Wetlands and Aquatic Assessment was conducted by Dacre James Alletson in September 2021 (**Appendix F** of the DBAR). The findings are summarised below.

Managers House:
The wetlands at the Managers House are probably all associated with the past agricultural activities in the area. Some may be old borrow pits from which road material may have been extracted while others may be vestigial stock watering points. Wetland 1 is a tall sedge/grass system and is probably a Seep although the hydrology is unclear. Dominant species include Wild Rice Grass (*Leersia hexandra*), Buffalo Grass (*Stenotaphrum secundatum*), Sedges (*Cyperus sexangularis*) and other *Cyperus* species. The slope of the hill below the house is away from any wetland but is toward the headwaters of a minor watercourse. However, the house is some 280m away from the watercourse and so is well outside of the Regulated Area of the channel and will not affect it.

Donors House and New Road:
The only wetland area which appears to be included within the 500m radius around either the donor's house or the new road is a small portion of the NFEPA wetland which includes the channel of the Mzinene River. However, the mapping exaggerates the width of the wetland and the radius does not reach to the river channel which has no floodplain at that point. On the basis of the distance of the donor's house and the associated new section of access road from any wetland or watercourse it is concluded that there will be no impact on the natural systems.

Office and FreeMe Complex:
A wetland was found within the 500m radius of the office and the FreeMe Complex site which lies at the south-eastern corner of the project area and this wetland appears to be a small seep in a pineapple field to the north-east. This site was not visited but was only observed on Google Earth. There are further wetlands in that area but all seem to have been transformed to some extent by agriculture. The proposed development is unlikely to affect any of them.

Tented Campsite:
There are two small seasonal watercourses near the tented camp site and their regulated areas will include the camp. The Mzinene River and a portion of a flooded backwater are located some 300m from the camp centre with the terrain in that area being characterised by low gradients. Due to the flat terrain and an intervening space of approximately 300m it is not thought that the tented camp poses any threat to the Mzinene River and its associated wetlands.

The impacts on the aquatic ecosystems are likely to be minimal although some care will be required in the construction process. Ongoing monitoring is recommended.

9.5 Watercourses

The primary river in the area is the Mzinene River which is a NFEPA listed free-flowing river discharging into Lake St Lucia in the Isimangaliso Wetland Park which is also a Ramsar Site and a World Heritage Site.

The given PES score of the river is Category A (Unmodified, Natural) although the presence of the dam wall to the west of Road R22, together with upstream water abstractions for agriculture, suggests that it may be in Category A/B or even Category B (Largely Natural with few modifications). The margins of the river are generally heavily wooded and are steep. In places are narrow strips of reedbeds (*Phragmites australis* and *P. mauritianus*). These conditions have arisen as a result of the downstream dam permanently inundating the lower levels of the natural channel leaving the steep primary channel banks as the new permanent margins.

Flowing into the Mzinene River are numerous tributary streams. These are all non-perennial in terms of their flows and so water is only present in them at times of above average rainfall. Some of the channels observed are so minor that they are virtually undetectable other than for their position in the landscape. Thus they are category A (Very Seldom Wetted) channels with perhaps a few being in Category B (Frequently Wetted) in just their lowest reaches near the Mzinene River.

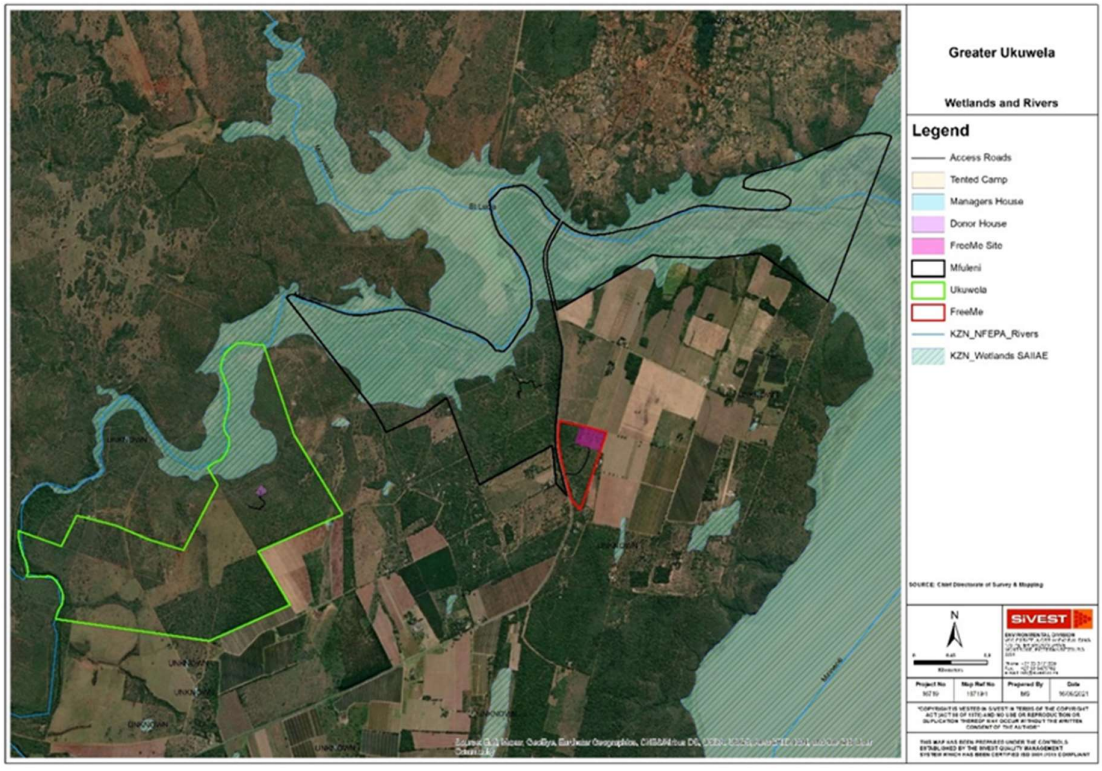

Figure 5: Wetlands and Watercourses of study area

9.6 Vegetation

The vegetation types covering the entire project area include the following:

- Western Maputaland Clay Bushveld SVI 20 (making up approximately 47% of the reserve);
- Maputaland Pallid Sandy Bushveld SVI 25 (making up approximately 22% of the reserve);
- Tembe Sandy Bushveld SVI 18 (making up approximately 3% of the reserve);and
- Freshwater Wetlands : Subtropical Freshwater Wetlands : Short Grass/ Sedge Wetlands AZf (making up approximately 28% of the reserve).

The Greater Ukuwela Nature Reserve is bordered by the Mzinene River and the Mun-Ya-Wana to the north, pineapple farming to the south and Lake St Lucia to the east, resulting in a variety of historical land uses. The Greater Ukuwela Nature Reserve is currently zoned as a Nature Reserve and is rehabilitating from many years of livestock, pineapple, cotton and sisal farming that occurred on the properties. The area is currently utilised for conservation with plains game inhabiting the Greater Ukuwela Nature Reserve. Some alien and invasive species were identified in the assessment, however this is related to historical agricultural processes and the establishment of fast replicating species, however the majority of the sites is classified as natural.

According to Mucina and Rutherford 2006 and VegMap 2018, the site is classified as Western Maputaland Clay Bushveld (Vulnerable), Tembe Sandy Bushveld (Least Concerned) and Maputaland Pallid Sandy Bushveld (statutorily conserved). Upon undertaking the groundtruthing exercise it was found that the site is transformed from natural due to historical agricultural practices and as such, is impacted by bush encroachment and some alien invasive species. Although species representative of the three vegetation types present, at Greater Ukuwela Nature Reserve occur, further rehabilitation and restoration is required to be representative vegetation types. Species diversity was estimated to be medium.

A total of 37 plant species were recorded during the field survey, of which 6 were alien. Two plant species fall under the KwaZulu-Natal Nature Conservation Management Act were noted within the development footprint (*Asparagus spp., Aloe ferox*).

9.6.1 Donor House

Vegetation associated north-west facing slope of the Donor House site comprised of a well-developed but relatively dense stand of trees up to 3m in height, a sparse shrub layer of up to 1.5m in height and an herbaceous and graminoid layer up to 1m in height (Error! Reference source not found.). Diversity at the Donor House was estimated to be low to medium due transformation and recovering from agriculture.

Tree species identified in the north-west facing slope of the donor site included but was not limited to Sickle Bush (*Dichrostachys cinerea*), Buffalo Thorn (*Ziziphus mucronata*), Sweet Thorn (*Vachellia nilotica*) and Guarri (*Euclea divinorum*) Error! Reference source not found..

The dominant graminoid component of the Donor House site was noted to be Berea grass (*Dactyloctenium australe*) Error! Reference source not found..

The dominant alien and invasive species present at the Donor House was the Potato creeper (*Solanum seaforthianum*) and Cotton (Gossypium hirsutum), **Plate 3**.

Plate 1: Vegetation component of the Donor House.

Plate 2: Dichrostachys cinerea trees with Dactyloctenium australe grass dominating the ground cover of the area.

Plate 3: *Solanum seaforthianum* and *Gossypium hirsutum* are the dominant alien and invasive species at the Donor House.

9.6.2 Tented Camp

The Tented Camp site is dominated by a large Broadpod Robust Thorn (*Vachellia robusta subsp. robusta,* **Plate 4**), interspersed with Sickle Bush and Marula (*Sclerocarya birrea*, protected under the National Forest Act, **Plate 5**). Further species to note was the presence of the *Asparagus* genus, which is provincially protected under the Natal Nature Conservation Ordinance (**Plate 6**). No other species of conservation concern were noted at the Tented Camp.

Plate 4: *Vachellia robusta subsp. robusta* dominating the Tented Camp area.

Plate 5: Nationally protected *Sclerocarya birrea*.

Plate 6: Provincially protected *Asparagus.*

Roads leading to the Tented Camp are dominated the similar vegetation makeup of the Donor house, with the inclusion of species such as Weeping Boer-Bean (*Schotia brachypetala*) and further Marula trees. The grass component is dominated by Guinea Grass (*Panicum maximum*) and Weeping Love Grass (*Eragrostis curvula*).

Plate 7: Vegetative component on the access roads.

9.6.3 Managers House

The woody component at the managers house is dominated by a tree and grass layer (trees up to 3m in height,

Plate 9). Trees comprised of a stand of Tamboti (*Spirostachys africana*), Sweet Thorn, Buffalo thorn, Sickle Bush, Puzzle Bush (*Ehretia rigida*) and White Stem Guarri (*Euclea daphnoides)*

(**Plate 9**). The graminoid component comprised of Weeping Love Grass, Guinea Grass and False Panicum (*Brachiaria deflexa*).

Plate 8: Vegetation component of the Managers House.

Plate 9: Tamboti grove in proximity to the proposed Managers House.

9.6.4 FreeMe Site

The FreeMe site is heavily transformed and is in the process of recovering. There are however native species such as Marula, Duiker Berry (*Sclerocroton integerrimum*) and Green Monkey-Orange (*Strychnos spinosa*), with Straw Everlasting (*Helichrysum krausii*) dominating the grass / herbaceous layer (Plate 10). Alien and invasive species included Queen of the Night (*Cereus jaracaru*) and Parrifin Bush (*Chromolaena ordorata,*).

Plate 10: The dominant vegetation present at the FreeMe Site.

Plate 11: Alien and invasive *Chromolaena odorata.*

9.7 Faunal Description

According to Hilcove et al, (2021), the Greater Ukuwela Nature Reserve has the typical game species of a northern Zululand reserve without "Big 5". "A number of threatened mammal species naturally occur on the reserve including leopard (VU), honey badger (VU), serval (NT), spotted hyena (NT) and most likely (although not confirmed) side-striped jackal (NT). In addition, both cheetah (VU) and African wild dog (EN) are transient through the property".

The Ecological Assessment was conducted by Mark Summers in June/July 2021 (**Appendix F** of the DBAR). The findings are summarised below.

9.7.1 Avifauna

A total of 47 bird species were seen during the sampling period, however SABAP predicts 327 species to occur on site. A full list of avifauna species can be found in The Ecological Assessment (**Appendix F**), while the Protected Area Management Plan for Greater Ukuwela Nature Reserve has entire lists of avifauna present on site (Conservation Outcomes, 2021). Species seen were in flight and foraging within existing vegetation. This assumes that these birds were using the sample site as a viable home range and movement corridor, which is understandable as Greater Ukuwela Nature Reserve has riverine, valley bushveld and grassland habitat, surrounded by other protected areas. Additionally, the suite of birds seen tend to inhabit the above mentioned vegetation types. The sampling period time of the year was likely a limiting factor in species richness as migratory avifauna would no longer be present during July. No species of conservation concern were identified during the assessment.

A wide variety of species of conservation concern are predicted to occur, and breed on site. It should be noted that the Greater Ukuwela Nature Reserve Ecologist has noted Martial Eagle (*Polemaetus bellicosus*) nesting in proximity to the Mzinene River during the 2020 / 2021 nesting season. It is expected that the proposed development will result in negligible loss of habitat for species of conservation concern within an area that has been formally proclaimed and requires income for conservation activities.

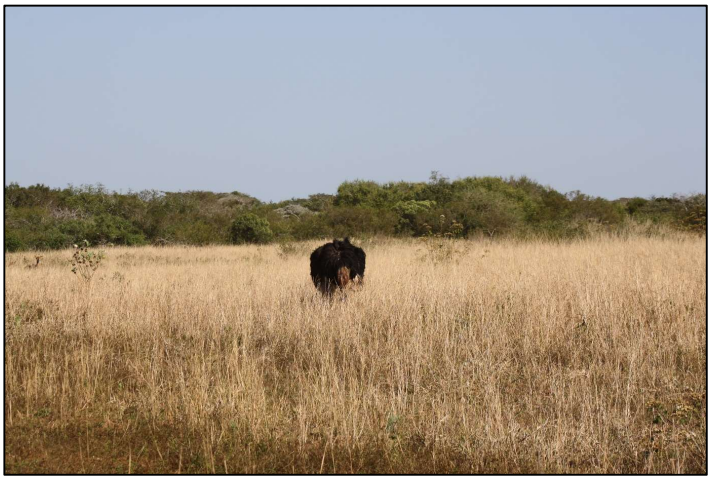

Plate 12: Common Ostrich (*Struthio camelus*) seen on site.

9.7.2 Herpetofauna

Herpetofauna include both reptiles and amphibians. While only one species of conservation concern, the Nile Crocodile (*Crocodylus niloticus*) was seen on site (**Plate 13**), four species of conservation concern may occur at Greater Ukuwela Nature Reserve. Habitat is available for a variety of reptile species at Greater Ukuwela Nature Reserve, with these species predicted to increase in abundance with the protection offered by the reserve. No amphibians were noted on the site inspection, however there is abundant habitat provided in the wetlands and Mzinene River for amphibians.

Plate 13: Nile Crocodile seen in a reserve in the area.

9.7.3 Mammals

Five mammal species were seen during the site assessment, that being Impala (*Aepyceros melampus*), Nyala (*Tragelaphus angasii*), Giraffe (*Giraffa giraffa giraffa*), Hippopotamus (*Hippopotamus amphibius*, **Plate 14**) and the Vulnerable Leopard (observed by Jake Alletson, *Panthera pardus*). No further species of conservation concern were identified during the assessment, however there is available habitat at Greater Ukuwela Nature Reserve for 12 mammals of conservation concern to occur on site (**Error! Reference source not found.**).

Many of the iconic species are transient species coming from surrounding protected areas, and temporarily utilize Greater Ukuwela Nature Reserve as an ecological corridor and for foraging. It is expected that the proposed development will result in negligible loss of habitat for species of conservation concern within an area that has been formally proclaimed and requires income for conservation activities.

Plate 14: *Hippopotamus amphibius* seen in the Mzinene River.

9.7.4 Butterflies

No butterfly or moth species of conservation concern were noted on site.

9.7.5 Other Species

No invertebrates predicted to occur on site by the DFFE screening tool, TSCP Minset or species of conservation concern were identified on site.

10. DESCRIPTION OF THE SOCIO- ECONOMIC ENVIRONMENT

10.1 Socio Economic Characteristics

According to the Greater Ukuwela Nature Reserve Management Plan (Hilcove Et al (2021): Ukuwela "*provides employment to local communities though the hiring of field rangers and hospitality staff. In addition, it has aided in SMME development, through the provision of alien plant removal contracts to local, all-women, teams*".

In addition, the applicant has been actively involved in community upliftment projects in the region, including the following:

- support to local creche's through the provision of food and the donation of education toys;
- support to local schools through the provision of learning equipment; and
- provision of food to a local orphanage.

The Management Plan further lists the following as Socio-economic values of the Reserve:

Socio-economic values	▪ The Greater Ukuwela Nature Reserve provides benefits to its landowners flowing from tourism and sustainable resource use. ▪ The Greater Ukuwela Nature Reserve contributes to community upliftment through biodiversity conservation, tourism and upliftment programmes.

Figure 6: Socio-economic values of the Greater Ukuwela Nature Reserve

10.1.1 Umkhanyakude District Municipality

According to the latest IDP 2018/2019, Umkhanyakude District Municipality is located in the Northern area of KwaZulu-Natal along the coastline (Eastern boundary) and is approximately 12 818 km^2 in size and with a population totalling 625,846. The district is recognised for it's tourism attractions and abundance of biodiversity and ecology. It is home to the iSimangaliso Wetlands Park World Heritage Site and other game reserves, marine protected areas and natural forests. Tourism is therefore a major contributor to the revenue of the district.

The following Local Municipalities are located within the Umkhanyakude District:

- UMhlabuyalingana Municipality (KZ 271);
- Jozini Municipality (KZ 272);
- The Big 5 Hlabisa Municipality (KZ 276); and
- Mtubatuba Municipality (KZ 275).

Surrounding Bordering Areas:

North	The Republic of Mozambique
East	The Indian Ocean
South	King Cetshwayo District Municipality (DC28)
West	Zululand District Municipality (DC26)

The Kingdom of Swaziland borders to the North- West.

According to the 2018/2019 IDP, one of the Key Management Priorities of the District Municipality is to "*Encourage local tourism, as opposed to mainly focussing on foreign tourists. - The unique biodiversity and cultural heritage. There is a world heritage site, the iSimangaliso Wetland Park, with a scenic pristine environment and the coastal atmosphere thus, creating more opportunities for tourism development which attracts a number of tourists internally and internationally*".

The key economic structure and trends in the District can be summarised as follows (Taken from the 2018/2019 IDP):

- *Small size of district economy in provincial comparative terms (e.g. less than 5% of the size of the eThekwini municipality in 2011)*
- *Although growing from a small base, the economy experienced significant growth in excess of 9% per annum, especially in the period from 2000 onwards;*
- *Two dominant local economies within the district are the Mtubatuba and Jozini LMs accounting for approximately R1.9 and R1.7 billion of GVA in 2011 respectively;*

- *Dominant economic sectors in UKDM as measured by GVA is the retail, catering and accommodation sector accounting for R1.45 billion in 2011, the manufacturing sector (R1.37 billion), and the general government services sector (R1.34 billion);*
- *The manufacturing sector increased its contribution to total GVA from 10.3% to 19.1%, and the retail, catering and accommodation sector its contribution from 13.5% to 20.3%;*
- *Agricultural sector has shown some significant growth of approximately 5.5% per annum over the period 1995 to 2011, but represents the third lowest output amongst the districts within the province;*
- *The number of formal employment opportunities in the agricultural sector remained relatively stable at approximately 9000 over the period from 2000 to 2005 but thereafter decreased significantly to a total estimated figure of 4983 by 2010; and*
- *The district economy became more concentrated in a select number of sectors with the Tress index increasing from a value of 36.7 in 2000 to 42.2 in 2011; (Source: DGDP, 2017).*

10.1.2 Big 5 Hlabisa Local Municipality

Big 5 Hlabisa Local Municipality was established with the amalgamation of The Big 5 False Bay Local Municipality and Hlabisa Local Municipality on 3 August 2016. Big Five Hlabisa has the combination of both subsistence and commercial agriculture. Subsistence agriculture is the most wide-spread in the old Hlabisa municipality side, covering most of the area. The area is not regarded as an area with a high agricultural potential, with only 20% of the area being thought to be arable. The majority of this area is degraded through extensive settlement and other land uses. In the then Big Five False Bay municipality, there are large areas under commercial and subsistence agriculture around Hluhluwe. However, the area is not conducive to supporting large scale agriculture.

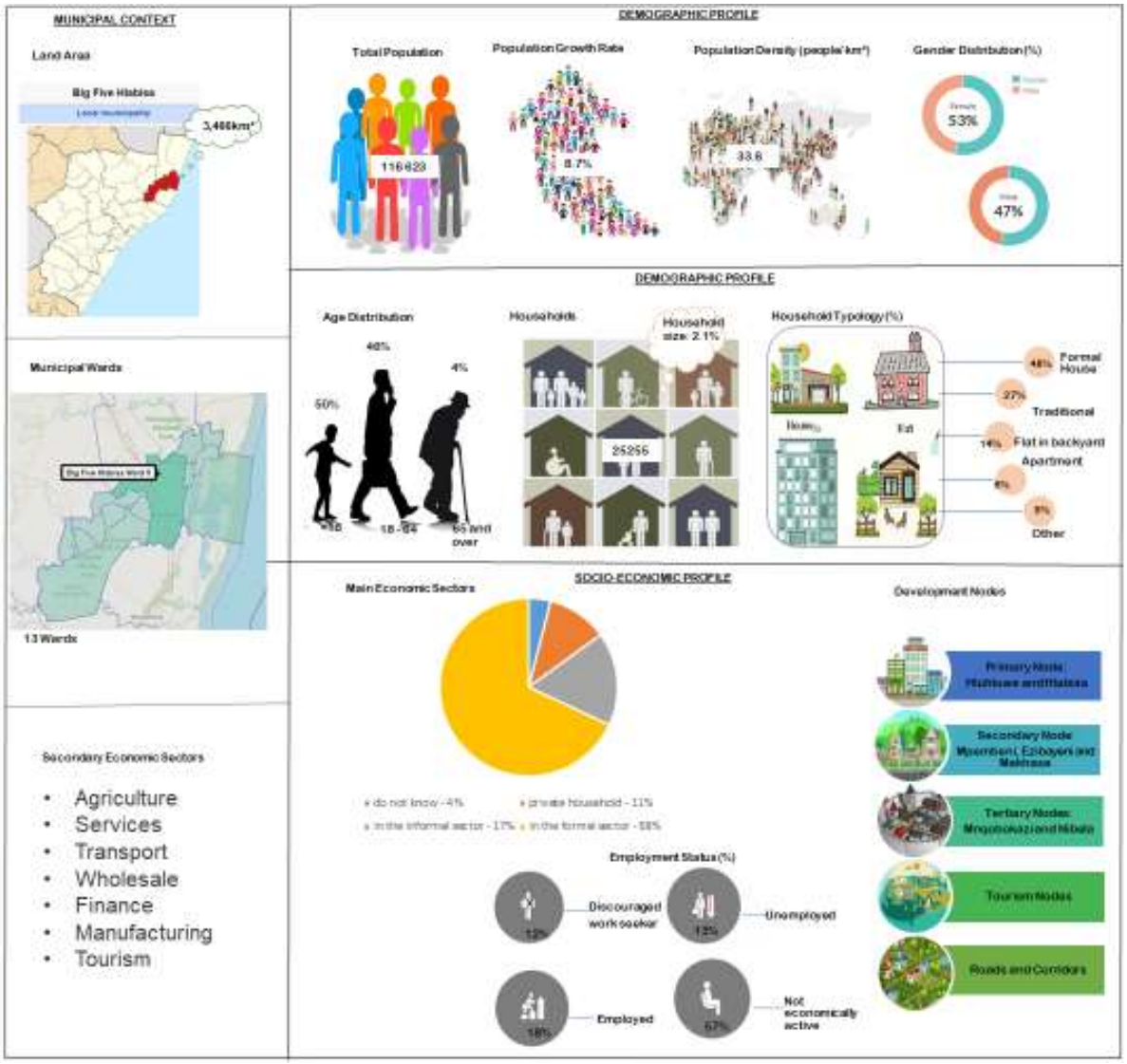

Figure 7: Socio-Economic Infogram for Big 5 Hlabisa Local Municipality[2]

[2] Source: https://wazimap.co.za/profiles/municipality-KZN276-big-five-hlabisa/

10.2 Cultural/Historical Environment

10.2.1 Heritage

The Heritage Assessment (including Palaeontology) was conducted by Gavin Anderson of Umlando: Archaeological Surveys and Heritage Management. The desktop Heritage Impact Assessment (HIA) and Paleontological Impact Assessment (PIA) Reports dated 07 July 2021 is included in **Appendix F of the DBAR**.

The desktop HIA process consisted of three (3) steps, namely:

- Step I – Desktop Assessment: A background research of the general history of the study area;
- Step II – Field Survey: A field survey was conducted of the application area, and
- Step III – The final step involved the recording and documentation of relevant heritage resources, the assessment of resources in terms of the HIA criteria and report writing, as well as mapping and constructive recommendations.

The Donor's House has artefacts in a secondary context, while part of the track passes areas of high artefact concentration. The track will need to be monitored during construction and relevant permits will be required. The tented camp has isolated artefacts and fossils that appear to have rolled down the hill onto this platform.

10.2.2 Palaeontological

According to the Palaeontological Assessment (**Appendix F**), Fossil Cephalopods, including ammonites, nautiloids (**Figure 8**) and belemnites, and fossil (petrified) wood (**Figure 9**) have been found within the underlying rocks, which are well known for their fossil content. The adjacent lake margin outcrop is known to be fossiliferous, as is the Nibela Peninsula. At Lister's Point (nearby) a very rare fossil marine carbonate reef is present (Cooper *et al*, 2013). This lithology has not been reported from the project area, but attention should be paid to this possibility.

Figure 8: Example of ammonites and nautiloids found within the St Lucia Formation (K-Ts)

Figure 9: Example of what fossil (petrified) wood looks like

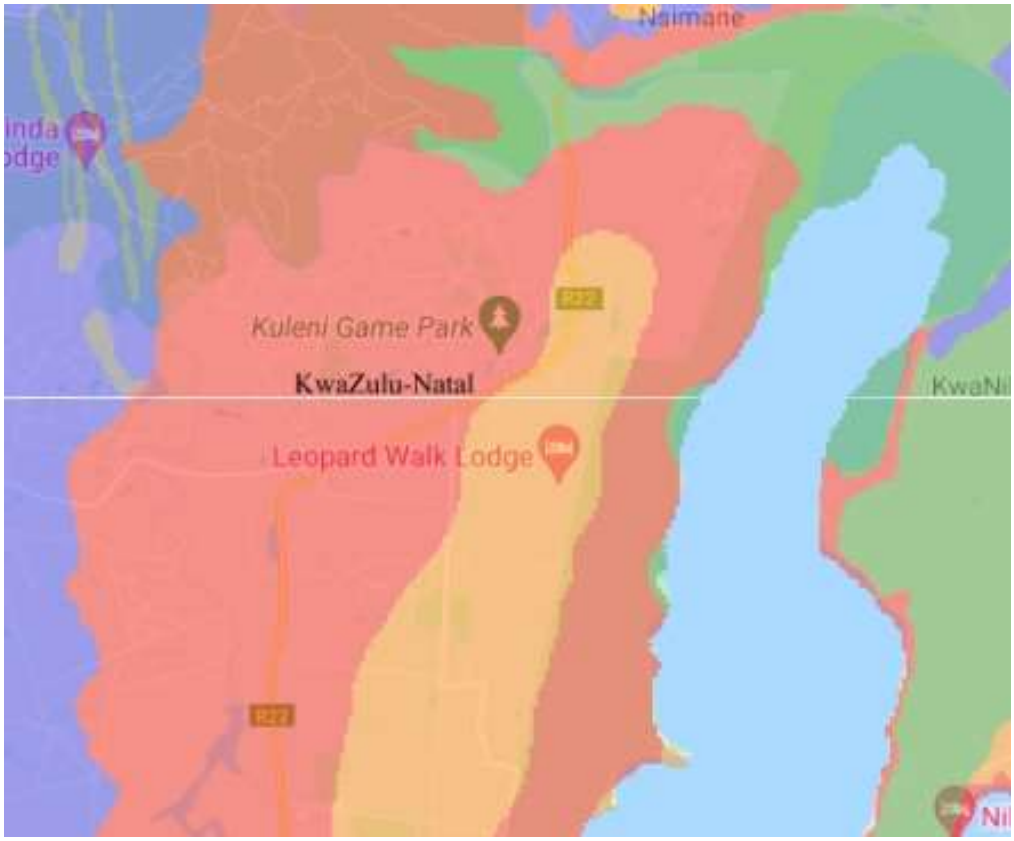

Figure 10: Palaeosensitivity map. Red (Km, Kmz, K-Ts) is very highly sensitive. The yellow shaded area corresponds to Qbe (red sands) and, although designated as highly sensitive, is unlikely to contain fossils (Table 9 below). The areas shaded green correspond to alluvial deposits at the surface, unlikely to contain fossils.

Table 9: Palaeontology of the lithologies that may be encountered (after Groenewald, 2012).

Map Code	Formation	Fossils Likely to be Encountered
Km	Makatini	Fossil wood (extensively bored by Teredo worm), plant fragments, marine invertebrates
Kmz	Mzinene	Ammonites, nautiloids, gastropods, echinoids, fossil logs (bored by Teredo worm) and arthropod burrows.
K-Ts	St Lucia	Ammonite, nautiloid, echinoid, bivalve, gastropod and reptile bone fossils
Qbe	Umkwelane	Very unlikely
Alluvium	Berea Red Sand	Very unlikely

The palaeontology of the area is of high significance (
Figure 10). The desktop study suggested that fieldwork would be required to fully assess the proposed developments on the fossil record prior to construction. A Paleontological Chance Finds Protocol has therefore been included in the EMPr.

11. POLICY AND LEGISLATIVE CONTEXT

The relationship between the project and certain key pieces of environmental legislation is discussed in the subsections to follow.

11.1 The Constitution

The Constitution of the Republic of South Africa, Act 108 of 1996 sets the legal context in which environmental law in South Africa occurs and was formulated. All environmental aspects should be interpreted within the context of the Constitution, National Environmental Management Act 107 of 1998 and the Environment Conservation Act 73 of 1989.

The Constitution has enhanced the status of the environment by virtue of the fact that an environmental right has been established (Section 24) and because other rights created in the Bill of Rights may impact on environmental management through, for example, access to health care, food and water and social security (Section 27). An objective of local government is to provide a safe and healthy environment (Section 152) and public administration must be accountable, transparent and encourage participation (Section 195(1) (e) to (g)).

Section 24 of the Constitution states that:

"Everyone has the right –

- *To an environment that is not harmful to their health or well-being; and*
- To *have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:*
  - *Prevent pollution and ecological degradation;*
  - *Promote conservation and*
  - *Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."*

The Constitution is the overarching legislation for South Africa. Although it provides for certain rights and obligations, the NEMA has been promulgated in order to manage the various spheres of both the social and natural environment.

11.2 National Environmental Management Act (107 of 1998)

The National Environmental Management Act (Act No. 107 of 1998) was promulgated in 1998 but has since been amended on several occasions from this date.

The act intends to provide for:

a) co-operative environmental governance by establishing principles for decision-making on matters affecting the environment;
b) institutions that will promote co-operative governance and procedures for coordinating environmental functions exercised by organs of state;
c) to provide for the prohibition, restriction or control of activities which are likely to have a detrimental effect on the environment; and
d) to provide for matters connected therewith.

NEMA is the overarching legislation which governs the Basic Assessment (BA) process and environmental management in South Africa. Sections 24 and 44 of NEMA make provision for the promulgation of regulations that identify activities which may not commence without an Environmental Authorisation (EA). Activities that may significantly affect the environment must be considered, investigated, and assessed prior to implementation.

According to Section 2(3) of the National Environmental Management Act (NEMA) (Act No. 107 of 1998), "development must be socially, environmentally and economically sustainable", which means the integration of these three factors into planning, implementation and decision-making so as to ensure that development serves present and future generations.

The EIA Regulations, 2014 (as amended) identify lists of activities which have the potential to result in detrimental environmental impacts and thus require EA, subject to either "BA" or "Scoping and Environmental Impact Reporting (EIR)". The Regulations prescribe the procedural and substantive requirements for the undertaking of EIAs and the issue of EA's.

The proposed project triggers listed activities under Listing Notice 1, and 3 and thus requires an EA subject to a BA Process. The listed activities are further detailed in Section 7.2 above.

11.3 National Water Act (Act 36 of 1998)

The National Water Act (NWA) No 36 of 1998 was promulgated on the 20th of August 1998. This Act is important in that it provides a framework to protect water resources against over exploitation and to ensure that there is water for socio-economic and economic development, human needs and to meet the needs of the aquatic environment. The Act also recognises that water belongs to the whole nation for the benefit of all people.

Water resources as defined include a watercourse, surface water, estuary or aquifer. Specifically, a watercourse is defined as (inter alia):

- A river or spring;
- A natural channel in which water flows regularly or intermittently; and
- A wetland, lake or dam into which, or from which water flows.

Due to the possible encroachment into the 500m buffer of wetland areas, and the abstraction of water from a borehole, the following Section 21 water uses in terms of the NWA may be triggered and require licensing:

(c) impeding or diverting the flow of water in a watercourse; and
(i) altering the bed, banks, course or characteristics of a watercourse.

An Aquatic Assessment (**Appendix F**) has been conducted to explore how the proposed development may impact on identified water resources as protected by the Act. In order to assess impacts in terms of the NWA, the wetland specialist has paid attention to the definition of the "Regulated Area of a watercourse". The following applies:

In terms of the "General Authorisation in terms of Section 39 of the National Water Act, 1998 (Act No. 36 of 1998) for Water Uses as defined in Section 21(c) and (i)", Notice 509 of 2016, specifies that the "regulated area of a watercourse" is to mean:

The outer edge of the 1 in 100 year flood line and / or delineated riparian habitat, whichever is the greatest distance, measured from the middle of the watercourse of a river, spring, natural channel, lake or dam;

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

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

A 1 in 100 year floodline was not available for the project area and so the 500m radius mandated for wetlands or pans was used in all areas.

The identified impacts have been assessed by means of the Department of Water and Sanitation (DWS) Risk-based Assessment Matrix (DWS, 2014). All of the risks were assessed for conditions during the Construction Phase and with pre- and post-mitigation conditions, while the risk associated with seepage from septic tanks is also assessed for the Operational Phase. The outputs of the Matrix are provided in the specialist assessment in **Appendix F** but have all come out as low risk.

The necessary Water Use Authorisation (WUA) is required and is currently being undertaken by SiVEST.

11.4 The National Heritage Resources Act 1999 (25 of 1999)

The National Heritage Resources Act promotes good management of the heritage resources of South Africa which are deemed to have cultural significance and to enable and encourage communities to ensure that these resources are maintained for future generations.

The aim of the Act is to introduce an integrated, three-tier system for the identification, assessment, and management of national heritage resources (operating at a national, provincial, and local level). This legislation makes provision for a grading system for the evaluation of heritage resources on three levels which broadly coincide with their national, provincial, and local significance.

This Act requires investigation to determine the impact of heritage resources when developments exceed the thresholds list in section 38 (1) of the act:

(a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
(b) the construction of a bridge or similar structure exceeding 50 m in length;
(c) any development or other activity which will change the character of a site—
    (i) exceeding 5 000 m^2 in extent; or
    (ii) involving three or more existing erven or subdivisions thereof; or
    (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
    (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
(d) the re-zoning of a site exceeding 10 000 m^2 in extent; or
(e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority,

The proposed development would involve; (a) the construction of a road, (c) any development or other activity which will change the character of a site (exceeding 5 000 m^2 in extent); or involving three or more existing erven.

Under the legislation, the South African Heritage Resources Agency (SAHRA) was established, which replaced the National Monuments Council. SAHRA is responsible for the preservation of heritage resources with exceptional qualities of special national significance (Grade I sites). A Provincial Heritage Resources Authority, established in each province, will protect Grade II heritage resources which are significance within the context of a province or region. Buildings and sites of local interest (Grade III sites) is the responsibility of local authorities as part of their planning functions. In this case, Amafa KZN will need to be consulted with extensively throughout the process and the relevant reports will be uploaded onto the SAHRIS.

Within the scope of this project, Section 38 of the NHRA (25 of 1999), states that, as described above, an assessment of potential heritage resources in the development area needs to be done. A Heritage Impact Desktop Assessment has therefore been commissioned to explore how the proposed development may impact on heritage resources and potential cultural artefacts as protected by the Act.

11.5 National Environmental Management: Biodiversity Act (NEM:BA) (Act No. 10 of 2004, as amended)

As the principal national act regulating biodiversity protection, the National Environmental Management: Biodiversity Act (NEM:BA) (Act No. 10 of 2004), which is administered by the DFFE, is concerned with the management and conservation of biological diversity, as well as the use of indigenous biological resources in a sustainable manner. The term biodiversity, according to the Convention on Biodiversity (CBD), refers to the variability among living organisms from all sources including, inter alia terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity in genes, species and ecosystems.

The overarching aim of the NEM:BA, within the framework of the NEMA, is to provide for:

- The management and conservation of biological diversity within South Africa, and of the components of such biological diversity;
- The use of indigenous biological resources in a sustainable manner; and
- The fair and equitable sharing among stakeholders of benefits arising from bio-prospecting involving indigenous biological resources.

In terms of this Act, the developer has a responsibility to:

- Conserve endangered ecosystems and restriction of activities according to the categorisation of the area (not just by listed activity as specified in the EIA regulations);
- Promote the application of appropriate environmental management tools in order to ensure integrated environmental management of activities thereby ensuring that all development within the area are in line with ecological sustainable development and protection of biodiversity; and
- Limit further loss of biodiversity and conserve endangered ecosystems.

The South African National Biodiversity Institute (SANBI) was established in terms of the NEM:BA, its purpose being (inter alia) to report on the status of the country's biodiversity and the conservation status of all listed threatened or protected species and ecosystems.

The NEM:BA provides for a range of measures to protect ecosystems and for the protection of species that are threatened or in need of protection to ensure their survival in the wild, including a prohibition on carrying out a 'restricted activity' involving a specimen of a listed threatened or protected species without a permit issued in terms of Chapter 7 of the Act. According to Section 57 of the Act, 'Restricted activities involving listed threatened or protected species':

A Biodiversity Assessment (**Appendix F**) has been conducted to explore how the proposed development may impact on biodiversity as protected by the Act. In addition, all relevant conservation departments (such as Ezemvelo KZN Wildlife) will be invited to provide comments with regards to the proposed development.

11.6 National Environmental Management: Protected Areas Act, 2003 (Act No.57 of 2003 as amended)

The overarching aim of the National Environmental Management: Protected Areas Act (NEMPAA) No. 57 of 2003, within the framework of NEMA, is to provide for:

- the declaration and management of protected areas;
- co-operative governance in the declaration and management of protected areas;
- effect a national system of protected areas in South Africa as part of a strategy to manage and conserve its biodiversity;
- a representative network of protected areas on state land, private land and communal land;
- promote sustainable utilisation of protected areas for the benefit of people, in a manner that would preserve the ecological character of such areas;
- promote participation of local communities in the management of protected areas, where appropriate; and

- the continued existence of South African National Parks.

According to Hillcove *et al, 2021*: "*The Protected Areas Act establishes the legal basis for the creation and administration of protected areas in South Africa, as its objectives include provisions "for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes". The Act sets out the mechanisms for the declaration of protected areas and the requirements for their management*."

The Greater Ukuwela Nature Reserve has been registered as an Ezemvelo KZN Biodiversity Stewardship Site and as such is proclaimed as a Protected Area as defined within the National Environmental Management: Protected Areas Act of 2003 (NEMPAA), as amended. The declaration was gazetted on the 27 May 2021, in Gazette No. 2290

11.7 Conservation of Agricultural Resources Act (CARA) (Act No. 43 of 1983)

The Conservation of Agricultural Resources Act (CARA) (Act No. 43 of 1983) controls the utilisation of natural agricultural resources in South Africa. The Act promotes the conservation of soil, water sources and vegetation as well as the combating weeds and invader plants. The Act requires the protection of land against soil erosion and the prevention of water logging and salinization of soils by means of suitable soil conservation works to be constructed and maintained. The utilisation of marshes, water sponges and watercourses are also addressed.

The primary objective of the Act is to conserve natural agricultural resources by:

- maintaining the production potential of land;
- combating and preventing erosion and weakening or destruction of the water resources;
- protecting vegetation; and
- combating weeds and invaders plants.

In terms of this Act, no degradation of natural land is permitted. Rehabilitation after disturbance to agricultural land is also managed by this Act. The Act prohibits the spreading of weeds and prescribes control measures that need to be complied with in order to achieve this. As such, measures will need to be taken to protect agricultural resources and prevent weeds and exotic plants from invading the site as a result of the proposed development.

Declared Weeds and Invaders in South Africa are categorised according to one (1) of the following categories:

- Category 1 plants: are prohibited and must be controlled.
- Category 2 plants: (commercially used plants) may be grown in demarcated areas providing that there is a permit and that steps are taken to prevent their spread.
- Category 3 plants: (ornamentally used plants) may no longer be planted; existing plants may remain, as long as all reasonable steps are taken to prevent the spreading thereof, except within the flood line of watercourses and wetlands.

An Agricultural and Soils Assessment (**Appendix F)** has been conducted to explore how the proposed development may impact on the agricultural production potential of the proposed site. According to the DFFE Screening Tool, Agriculture comes out as a Very High Sensitivity.

The DFFE screening tool is a guideline, and it is up to the specialists to verify these results in the field. The screening tool is based on coarse datasets and the areas may not be accurate.

The results show that none of the development sites are within any crop boundaries, which are designated by hashed polygons. These crop boundaries have High to Very High sensitivities. The remaining area ranges from Medium to High sensitivity. The Managers house and the Free Me site are within a High sensitivity area. The Donor house and the Tented camp site are within a Medium sensitivity area.

The following is a summarised findings of the Agro-Ecosystems Assessment conducted by Wayne Jackson.

The impact assessment has determined that the activities are rated as a Low impact on agricultural resources. This is largely due to the following aspects:

- The sites are not located on any existing or previously utilised agricultural land;
- The sites are not fragmenting agricultural resources;
- The development will be sparsely utilised as and secondary impacts are unlikely;
- The size of the development sites are small in nature and do not pose a significant impact on the overall agricultural importance of the region; and
- The sites are located within a protected nature reserve and it is not proposed to change the current land use to agriculture.

11.8 Protection of Public Information Act (Act No. 4 of 2013)

The Protection of Public Information Act (Act No. 4 of 2013) (POPIA) recognises the Constitutional requirement that everyone has a right to privacy.

Ultimately the Act promotes “the protection of personal information processed by public and private bodies; to introduce certain conditions so as to establish minimum requirements for the processing of personal information; to provide for the establishment of an Information Regulator to exercise certain powers and to perform certain duties and functions in terms of this Act and the Promotion of Access to Information Act, 2000 (PAIA); to provide for the issuing of codes of conduct; to provide for the rights of persons regarding unsolicited electronic communications and automated decision making; to regulate the flow of personal information across the borders of the Republic; and to provide for matters connected therewith”.

Due to the requirements around the Public Participation Process, SIVEST will process and capture information aligned to the POPIA and always obtain consent for I&APs information to be gathered, stored and distributed for the purpose of this project.

11.9 Additional Relevant Legislation

- Occupational Health and Safety Act (Act No. 85 of 1993) [OHSA];
- Environment Conservation Act (Act 73 of 1989) [ECA]
- Road Safety Act (Act No. 93 of 1996) [RSA];
- National Forestry Act (Act 84 of 1998) [NFA];
- National Environmental Management: Air Quality Act (Act No. 39 of 2004) [NEM:AQA];
- National Environmental Management: Waste Act (Act No. 59 of 2008, as amended) [NEM;WA];

- National Road Traffic Act (NRTA) (Act No. 93 of 1996, as amended)
- Development Facilitation Act (Act No. 67 of 1995) [DFA];
- Promotion of Access to Information Act, (Act No. 2 of 2000); [PAIA]
- The Hazardous Substances Act (Act No. 15 of 1973) [HSA];
- Water Services Act (Act No. 108 of 1998) [WSA];
- Municipal Systems Act (Act No. 32 of 2000) [MSA]; and
- Mineral and Petroleum Resource Development Act (Act No. 28 of 2002, as amended) [MPRDA].

12. KEY DEVELOPMENT STRATEGIES AND GUIDELINES

12.1 Umkhanyakude Integrated Development Plan (IDP) 2018/2019

According to Hilcove *et al.* (2021), "*The Big 5 False Bay Integrated Development Plan (IDP), Local Economic Development (LED) Plan and Spatial Development Framework (SDF) identify tourism, particularly ecotourism, as an important economic driver within the municipality. Linked to this, the SDF identifies the R22, which runs past the Ukuwela Nature Reserve as a Secondary Mobility Route. It has therefore been highlighted as a "Tourism Attraction Connector*"".

In terms of the continued management of protected areas within the UMkhanyakude District, the following are listed as management priorities:

- Integrated Management Plans (IMPs) of protected areas should observe and integrate Environmental Management Framework (EMF).
- The iSimangaliso Wetland Park is a World Heritage Site. Environmental Management efforts must ensure that this status is maintained and supported.
- Support and facilitate land planning and practices that enhance the overall biodiversity values and the role the region can plan in conserving the components of the northern part of the Maputaland-Pondoland-Albany biodiversity hotspot.
- Support and facilitate land planning and practices that enhance the overall objectives of the three TFCA initiatives.
- Support and facilitate land planning and practices that enhance the overall economic objectives based on wildlife industries that are compatible with the regions overall biodiversity values including ecotourism developments, stewardship programs and Community Conservation Areas.
- Game farming within the carrying capacity of existing veld resources.
- Protection of buffer zones and transitional zones.
- Advocate community conservation ventures and commensurate activities in buffers. Alignment with Buffer Policies of Protected Areas and the Zone of Influence Policy of the iSimangaliso Wetland Park Authority.
- Maintain working relationships between the various spheres of government to ensure a collaborative effort to conserve UKDM's protected areas and their adjoining buffer zones.

12.2 Umkhanyakude Spatial Development Framework (SDF)

The SDF identifies three nodes that are of relevance to the Greater Ukuwela Nature Reserve:

- The KwaMnqobokazi Traditional Authority: KwaGiba Tertiary Social Node, which envisages the development of an arts and craft centre, a post box centre, workshops, small scale municipal offices, and passive and active open space.
- The KwaMnqobokazi Traditional Authority: KwaMnqobokazi Tertiary Social Node, which envisages the development of retail facilities, a community service centre and the formalisation of an existing hall.
- The KwaMakhasa Traditional Authority: KwaMakhasa Community Multi-use Node, which includes a number of facilities that may be developed in the node such as a police station, health facilities, retail facilities and densification of rural housing.

12.3 Protected Area Expansion

According to Hilcove *et al.*: "*The Greater Ukuwela Nature Reserve falls between two priorities for both the national and KZN Protected Areas Expansion strategies; namely the HIP corridor and the False Bay Corridor. In addition, because the reserve is adjacent to the Mun-Ya-Wana Conservancy, it contributes to forming an important linkage with four macro-ecological corridors:*

- *The False Bay Corridor*
- *The Hluhluwe-iMfolozi Park Corridor*
- *The Lebombo South Corridor*
- *The Maputaland Corridor*

At a landscape level this means that the Greater Ukuwela Nature Reserve is important in linking other protected areas, in enabling large-scale ecological processes across the region and in enabling climate change adaptation through facilitating the movement of wide-ranging species across different areas and habitat types.".

13. NEED AND DESIRABILITY

A vision of the Greater Ukuwela Nature Reserve (Hilcove et al.) is to: "*To conserve wildlife and their habitats in northern KwaZulu-Natal; to be a model for sustainable conservation and protected area management, informed by science; and to ensure communities value, protect and benefit from conservation*". The need for this development supports the vision and is further elaborated on below.

13.1 Donor House

Wild Tomorrow Fund is as a wildlife conservation charity which receives financial donations from hundreds of people each year. These donations fund the conservation work performed on the Greater Ukuwela Nature Reserve. Wild Tomorrow Fund would like its major donors to experience the reserve first-hand and to share in the conservation achievements that they made possible. The Donor House will be a place for them to stay and learn about Wild Tomorrow Fund's current and future projects. The major donors will have the chance to invite their friends and family to stay with them. Wild Tomorrow Fund believes the Donor House will

be an excellent opportunity to deepen relationships with existing and potential donors that will ultimately lead to more funding for conservation. The donor house will be an important source of sustainable revenue for the reserve, bringing both invited and paying guests while creating additional employment to the area.

13.2 Tented Camp

Wild Tomorrow Fund has a paid volunteer programme where local and international people take part in conservation activities on the Greater Ukuwela Nature Reserve for two weeks at a time. There are typically two to three volunteer trips each year.

To increase the profits Wild Tomorrow Fund generates from these trips, they would like their guests to stay on reserve, thus eliminating the need to pay for third-party lodging. These savings will be used to fund their conservation and community projects.

13.3 Managers House

Wild Tomorrow Fund intends to build a simple two-bedroom house on the Greater Ukuwela Nature Reserve for their General Manager. Having the General Manager reside on-site will increase the output and quality of work from this employee and all other staff. An additional person living full-time on the reserve will also increase the overall security.

13.4 Reserve Office and FreeMe Complex

FreeMe is a South African wildlife rehabilitation organization based in Howick, SA. Wild Tomorrow Fund has entered into a legal agreement where FreeMe will lease four hectares of land from Wild Tomorrow Fund on the Greater Ukuwela Nature Reserve. The purpose is for FreeMe to create a wildlife rehabilitation centre for the indigenous mammals, birds, reptiles, amphibians and invertebrates in accordance with the Ezemvelo KZN Wildlife permit conditions. FreeMe's rehabilitation centre will fill a much needed void in the area for a reputable place where injured wildlife can be cared for.

Adjacent to the FreeMe rehabilitation centre will be a Reserve Office where Wild Tomorrow Fund employees will work. Having all employees working from one location will increase the productivity and quality of conservation work.

13.5 Job opportunities and household livelihoods

In addition to those benefitting from direct employment created at the project, various multiplier effects will assist in temporarily supporting existing jobs in the businesses offering services and goods that will be procured during construction activities. The increased temporary income earned by these businesses will, in turn, stimulate consumer spending, creating another round of multiplier effect, positively impacting on the employment situation in the area.

Household earnings are linked closely with trends in employment and, as such, will be affected positively by the creation of jobs as discussed above. The creation of temporary jobs during the construction period will temporarily increase affected households' income. Some of this income will be earned by workers from the local communities.

13.6 Skills development

In addition to the job creation, there is valuable opportunities for skills enhancement and knowledge transfer as quite often input from experts are required in this field. Therefore, opportunities for guiding and training of local workers is created. A variation of skill sets is required ranging from semi-skilled construction workers to highly skilled engineers. The skill set of the majority of the municipality's residents comprises of low-skills, which means that with proper planning and recruitment strategies, many of the local unemployed residents could be hired as temporary construction workers on site provided they satisfy any other recruitment criteria.

Those employed will either develop new skills or enhance current skills. This insinuates that inexperienced workers will have the opportunity to attain and develop new skills, while experienced workers will further improve their existing skills. Albeit the employment is temporary, the skills attained will be of long-term benefit to employees. However, as any skills set it will need to be supported and practised on a regular basis to maintain its currency.

Details on the anticipated socio-economic values associated with the proposed project are provided below:

Description	Value
Anticipated CAPEX value of the projects on completion	12,000,000
What is the expected annual turnover to be generated by or as a result of the projects?	1,900,000
New skilled employment opportunities created in the construction phase of the projects	4 people
New un-skilled employment opportunities created in the construction phase of the projects	3 people
New skilled employment opportunities created in the operational phase of the projects	4 people
New un-skilled employment opportunities created in the operational phase of the projects	2 people
What is the expected value of the employment opportunities during the operational and construction phases?	Construction lasting one year: 4 x R12 000 = R 48 000 3 x R7 000 = R 21 000 Total: R69 000 Operational ongoing: 4 x R12 000 per year = R 48 000 2 x R7000 per year = R 14 000 Total: R62 000

14. DETAILS OF ALTERNATIVES CONSIDERED

14.1 Introduction

As per the 2014 EIA Regulations (as amended), feasible and reasonable alternatives are required to be considered during the BA process. Alternatives are defined in Chapter 1 of the 2014 EIA Regulations (as amended) as "*different means of meeting the general purpose and requirements of the activity*". These alternatives may include:

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

Each of the alternatives in relation to the proposed development is discussed in the sections below.

14.2 Location/Site alternatives

No site alternatives for the proposed development are being considered as the placement of the various sites were informed by a desktop feasibility assessment, undertaken by SIVEST, which had recommended that infrastructure be placed within previously transformed areas and outside of CBAs: Irreplaceable areas, which the applicant had done prior to the specialist assessments taking place.

In terms of location alternatives, the various sites were chosen based on their intended usage, aesthetic appeal and outlook.

- The Donor House was chosen based on the views over the Ukuwela Valley.
- The Tented Camp was chosen based on its outlook and sheltering from the elements
- The Managers House location was chosen due to its proximity to the entrance of the site, and accessible to road infrastructure.
- The FreeMe site was based on site accessibility to main road systems within the greater conservation area.

The above sites were further evaluated according to their site sensitivity and proximity within CBA's and near watercourse, etc. Where possible, these were relocated out of sensitive areas prior to the specialists being appointed. Furthermore certain amendments were made based on specialist recommendations to avoid CBAs on certain sites (Refer to specialist suggestions made in **Appendix F5**). A portion of the FreeMe site still occurs within a CBA.

14.3 Activity/technology alternatives

Activity alternatives refer to the consideration of alternatives requiring a change in the nature of the proposed activity to be undertaken.

No other activity / technology alternatives are being considered due to the need for the facilities and their current location.

14.4 Layout alternatives

Layout alternatives were considered and assessed prior to the appointment of specialists. the final layout provided in this BAR has taken into account avoiding CBAs as far as reasonably possible. No further layouts were assessed as part of the BA process. Specialists recommended avoiding CBAs as far as possible and thus the final preferred layouts are avoiding CBAs with the exception of the FreeMe site.

14.5 No – go option

The 'no-go' alternative is the option of not undertaking the proposed grid connection infrastructure project. Hence, if the 'no-go' option is implemented, there would be no development. This alternative would result in no environmental impacts from the proposed project on the site or surrounding local area. It provides the baseline against which other alternatives are compared and will be considered throughout the BA process. Implementing the 'no-go' option would entail no development. The 'no-go' would however limit the reserves ability to fund operations.

15. PUBLIC PARTICIPATION PROCESS

Public participation is the cornerstone of any EIA. The principles of the National Environmental Management Act (NEMA) as well as the EIA Regulations (as amended 2017) govern the EIA process, including public participation. These include provision of sufficient and transparent information on an ongoing basis to stakeholders to allow them to comment, and ensuring the participation of previously disadvantaged people, women and the youth. All documents relating to the PP process have been included in **Appendix E**.

The public participation process is primarily based on two (2) factors, namely.

- Firstly, on-going interaction with the environmental specialists and the technical teams in order to achieve integration of technical assessment and public participation throughout; and
- Secondly, to obtain the bulk of the issues to be addressed early on in the process, with the latter half of the process designed to provide environmental and technical evaluation of these issues. These findings are presented to stakeholders for verification that their issues have been captured and for further comment.

The public participation (PP) process will be undertaken in accordance with the requirements of Regulations 39 to 44 of the EIA Regulations, 2014, as amended, (GN R 982). The primary aims of the Public Participation Process are:

- To inform I&APs and key stakeholders of the proposed project;
- To initiate meaningful and timeous participation of I&APs and key stakeholders;
- To identify issues and/or concerns of key stakeholders and I&APs with regards to the proposed project;
- To promote transparency and an understanding of the proposed project and its potential environmental impacts;
- To provide information used for decision-making;
- To provide a structure for liaison and communication with I&APs and key stakeholders;

- To assist in identifying potential environmental impacts associated with the proposed project;
- To ensure inclusivity (the views, needs, interests and values of I&APs and key stakeholders must be considered in the decision-making process);
- To focus on issues relevant to the proposed project and issues considered important by I&APs and key stakeholders;
- To provide responses to I&AP and key stakeholder queries / comments / concerns; and
- Meet the requirements for Public Participation as stated in Chapter 6 of the EIA Regulations, 2014 (as amended).

15.1 Compliance with the Regulations

In light of the country wide restriction enforced in terms of Government Gazette 43096 which has resulted in the entire country being placed in a national state of disaster and limits on the movement and gatherings of people in an effort to curb the spread of CoVID-19, the public participation process has been amended and adjusted. In response, SiVEST has formulated a unique Public Participation process which is as closely related to the requirements of Regulations 39 to 44 of the EIA Regulations, 2014, as amended, (GN R. 326) as possible.

Alternative means of undertaking the required stakeholder engagement have been designed and implemented by SiVEST to ensure that all I&APs are afforded reasonable opportunity to engage meaningfully. As such, SiVEST are proposing the following amendments to the public participation process, described in more detail in **Figure 11**.

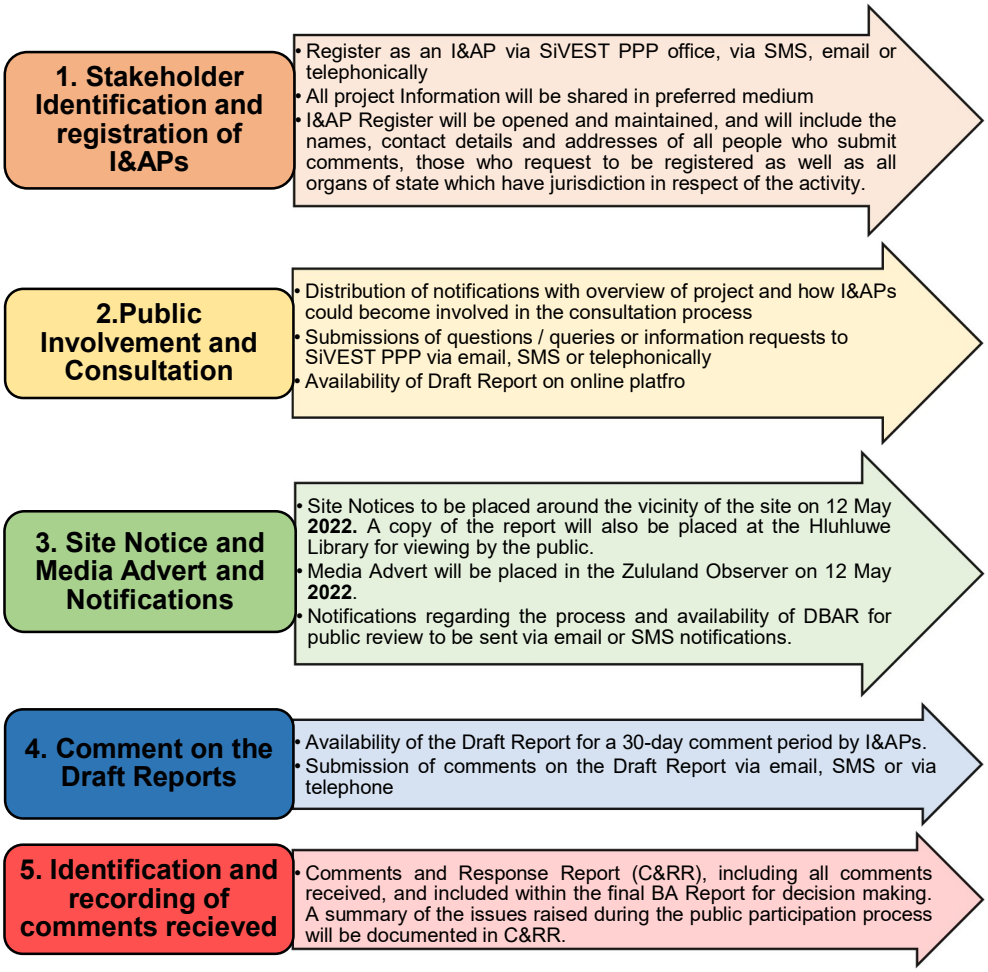

Figure 11: Schematic illustration of PPP Process

15.2 Activities to be undertaken

Figure 11 above provides an overview of the tools that are available to I&APs and stakeholders to access project information and interact with the public participation team to obtain project information and resolve any queries that may arise on the Ukuwela Project. The following activities are being undertaken as part of the Public Participation Process:

15.2.1 Notification of Interested and Affected Parties (I&AP's)

I&AP's and key stakeholders will be notified via email of the availability of the report.

15.2.2 Site Notices

Site notices will be placed around the vicinity of the site. Final positions will be provided in the Final BAR. A copy of the report will also be placed at the Hluhluwe Public Library for viewing by the public.

VENUE	STREET ADDRESS	HOURS	CONTACT NO
Hluhluwe Public Library	163 Zebra St, Hluhluwe, 3960	Mondays-Fridays	079 438 5291

		08:30 – 16:30pm.	

15.2.3 Advertisements

A media advert will be placed in the Zululand Observer Newspaper on 12th May 2022. Proof will be provided in the Final BAR.

15.2.4 Summary of the issues raised by Interested and Affected Parties to date

A summary of the issues raised during the public participation process of the Draft Basic Assessment Report (BAR) will be documented in the Comments and Responses Report. This report will be updated following the comment period and attached to the Final BAR.

15.2.5 Details of notification of landowners

Regulation 39 (1) of the EIA Regulations, 2014 (as amended), states that '*if the proponent is not the owner or person in control of the land on which the activity is to be undertaken, the proponent must, before applying for an environmental authorisation in respect of such activity, obtain the written consent of the landowner or person in control of the land to undertake such activity on that land'*.

Considering the applicant is the landowner, consent is not required in this case.

15.2.6 Draft Basic Assessment Report

Interested and affected persons (I&AP's) will be afforded a thirty (30) day comment period from the date of availability of the DBAR to provide comment on the DBAR. An I&AP register will be opened and will be attached to this report. This will include the names, contact details and addresses of all people who submit written comments, all people who request their names be placed on the register as well as all organs of state which have jurisdiction in respect of the activity.

16. IMPACTS AND RISKS IDENTIFIED FOR THE PREFERRED ALTERNATIVE

The SiVEST Impact Assessment method, dated 28 July 2017 (attached as **Appendix G**) has been utilised to assess the following potential impacts identified in the assessment phase and is presented in the following sections.

The method used in this impact assessment determines significance (can be both positive and negative) of an impact by multiplying the value of the environmental system or component affected by the magnitude of the impact on that system or component (System or Component Value x Impact Magnitude).

In this method, all significant impacts on the natural or biophysical environment are assessed in terms of the overall impacts on the health of ecosystems, habitats, communities, populations and species. Thus, for example, the impact of an increase in stormwater runoff generated by a development can only be assessed in terms of the impact on the health of the affected environmental systems.

Similarly, all significant impacts on the social and socio-economic environment are assessed in terms of the overall impacts to the quality of life, health and safety of the affected population, communities and/or individuals, with the exception of impacts on resources that are assessed on their own.

The following impacts have been identified for each of the proposed developments:

16.1 GUNR Office and Free Me Complex

UKUWELA NATURE RESERVE: GUNR OFFICE AND FREE ME COMPLEX																					
ENVIRONMENTAL PARAMETER	**ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE**	**ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION**									**RECOMMENDED MITIGATION MEASURES**	**ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION**								
		E	**P**	**R**	**L**	**D**	**I / M**	**TOTAL**	**STATUS (+ OR -)**	**S**		**E**	**P**	**R**	**L**	**D**	**I / M**	**TOTAL**	**STATUS (+ OR -)**	**S**
Planning Phase																					
Loss of Agricultural Resources (Including Land Use)	The loss of current agricultural land use through poor planning of new development footprints.	1	3	1	1	1	1	7	-	Low		1	1	1	1	1	1	5	_	Low
Loss of High Potential Soil Resources	The loss of high value soil resources through poor planning of new development footprints.	1	3	1	2	3	2	20	-	Low	1. Every effort must be made to avoid potential impacts from the outset of a project (e.g., through careful spatial or temporal placement of elements of infrastructure) to prevent or limit impacts to high potential soil resources.	1	1	1	2	3	2	16	_	Low
Loss of High Potential Land Capability	The loss of current agricultural land use through poor planning of new development footprints.	1	3	1	2	3	2	20	-	Low		1	1	1	2	3	2	16	_	Low
Construction Phase																					
Loss of Agricultural Resources (Including Land Use)	The loss of current agricultural land use through altering the land use for alternative land uses.	1	1	3	1	1	1	7	-	Low	1. No agricultural resources were identified within the project footprint.	1	1	3	1	1	1	7	_	Low
Loss of High Potential Soil Resources	The excavation, compaction, erosion, and contamination of high value soil resources.	1	2	3	2	3	2	22	-	Low	1. Topsoil that is removed during excavation must NEVER be buried or rendered unusable in any way (such as mixing it with spoils or being compacted by machinery). 2. During excavation soil must be excavated one layer at a time and stored in separate stockpiles so they can be returned in their natural order when the area is backfilled. This improves soil functions and improves the template for plant growth. 3. The footprint area must be kept to a minimum.	1	2	3	2	3	2	22	_	Low

											4. Where possible, plants should be cut down to ground level instead of being removed completely to stabilise the soil during land-clearing operations. 5. Once surfaces have been exposed, they must immediately be protected from erosion, so limiting the source of the sediment. 6. Temporary diversion must be used to direct runoff from impervious areas to the sediment traps. 7. Sediment traps must be used in areas of concentrated runoff. 8. If soil contamination occurs (such as due to a spill) the soil must be removed from the site and disposed of appropriately. 9. Green Engineering structures should be considered to improve infiltration into soil profiles and minimise runoff volumes.									
Loss of High Potential Land Capability	The loss of high potential land capability through altering the land use for alternative land uses. As well as through excavation, compaction, erosion, and contamination of soil resources.	1	1	3	2	3	2	20	-	Low	1. The high potential land which will be impacted on is small and will have a low impact as the land is not used for agriculture.	1	1	3	2	3	2	20	_	Low
Heritage	Impact on archaeological site DH01	1	1	3	4	3	1	12	-	Low	1. Area is to be monitored by a suitably qualified archaeologist after vegetation clearance and during any topsoil removal. A collection permit should be obtained so that any significant artefacts can be sampled. If needs be, the track can be altered if any features are noted.	1	1	3	4	3	1	12	_	Low
Indigenous natural vegetation	Loss, degradation or fragmentation of vegetation through direct clearing	1	3	1	2	2	2	18	-	Low	1. Footprint of the activity needs to be strictly adhered to. A site specific Environmental Management Programme needs to be developed for the construction and operation phases. 2. An Environmental Control Officer (ECO) needs to be appointed for the duration of construction. 3. Permits for plants collection/removal need to be obtained prior to search and rescue operations. 4. Vegetation clearance in the construction phase is to be remove in a phased approach, as and when it becomes necessary as vegetation harbours fauna. 5. Sensitive areas need to be demarcated clearly before construction commences. 6. Areas outside of the construction zone are to be designated as “no-go areas.	1	2	1	2	2	2	16	_	Low

Transformation of habitat for flora	Hard transformation of proposed access roads and accommodations will result in a marginal reduction in flora. The access roads being a linear activity will result in the disturbance of the soil surface, and this often leads to the establishment of alien invasive plant species.	1	3	2	3	3	3	36	-	Medium	1. Servitude widths need to be a strictly adhered to. 2. Where possible, indigenous vegetation needs to be retained. 3. Clearance for construction should be done in a phased approach, and rehabilitation should be done as soon as work has ceased along the section of routing. 4. Where possible, construction should occur in the dry season to prevent soil loss through stormwater. 5. Where possible, manual clearance of the vegetation should be done so as to prevent the unnecessary movement of machinery in no-go areas. 6. The contractor should implement an alien invasive control programme, particularly in areas where soil disturbance occurs. 7. Soil stockpiles need to be grassed with an indigenous mix or covered with shadecloth to prevent soil loss through wind and water erosion. 8. Strictly no trapping or hunting of fauna is allowed. 9. All open excavations need to be checked on a daily basis and any fauna that may be stranded will have to be caught and released by a qualified person. 10. Rehabilitation should take place as soon as construction of the section of line is complete. 11. Strictly no littering. The contractor should highlight this at daily toolbox talks and site clean-ups should occur on a daily occasion. 12. A mix of indigenous grass species, should be used for rehabilitation.	1	2	1	2	2	2	16	_	Low
Erosion related impacts	Vegetation binds and protects the soil surface, and when removed, increases erosion potential. This may lead to water and wind removing vital topsoil and blocking up drains and eventually clogging roadsides and drainage lines.	1	3	2	2	2	2	20	-	Low	1. All stormwater outflows must be protected with reno-mattresses and gabion baskets to reduce the effect of erosion on the access road. 2. Where possible, indigenous vegetation needs to be retained. 3. Vegetation should be cleared only when construction occurs in that section of the routing. 4. Soil stockpiles need to be grassed with an indigenous mix or covered with shadecloth to prevent soil loss through wind and water erosion. 5. Rehabilitation should take place as soon as construction is complete. 6. In areas of higher gradient, access roads should have erosion berms to prevent soil loss. 7. Construction activities should be limited to the winter months to prevent loss of soil to water runoff. 8. Spraying of the soil surface should occur when working in dusty conditions.	1	2	1	2	2	2	16	_	Low

Habitat transformation and fragmentation for fauna	Continued transformation of vegetation in the area will result in a marginal reduction in flora and fauna for the area. Disturbance of the soil surface and a leads to the establishment of alien invasive plant species. Continued transformation of the land results in habitat fragmentation, where edge effects decrease suitable habitat for a wide range of fauna in the area. This leads to an overall indirect decline in faunal diversity.	1	2	1	1	1	2	12	-	Low	1. Construction footprint needs to be a strictly adhered to. 2. Clearance of land and vegetation is not allowed, unless clearance occurs within the authorised project area. 3. Areas outside of the construction zone must be demarcated as “no-go” areas. 4. Where possible, indigenous vegetation needs to be retained. 5. Manual clearance of alien and invasive vegetation should be done so as to prevent the unnecessary movement of machinery in no-go areas. 6. An alien and invasive control programme should be implemented, particularly in areas where soil disturbance has occurred. 7. Soil stockpiles need to be returned to the excavations, with the subsoil being placed first, followed by the topsoil. 8. Monthly ECO auditing should occur during rehabilitation of the site. Once rehabilitation is complete, one three month, and one six month follow up audit should be conducted to assess the state of rehabilitation.	1	2	1	1	1	1	6	_	Low
Paleontology	Uncovering of Significant Palaeontological Material	1	3	2	3	1	3	30	-	Medium	1. A PIA field survey will be required to determine the full extent of the fossil record. 2. It is a recommendation of this report that a suitably qualified palaeontologist visits this site to assess for the presence of fossils in the proposed development area. 3. Chance Finds Protocol to be adopted	1	2	2	1	1	2	14	_	Low
Aquatic	Construction of new roads and upgrading of existing roads: Mobilisation of soil which could be transported into watercourses by storm water flows	1	1	1	1	1	2	10	-	Low	1. Ideally the road construction will be done in the dry season when rainfall is at its lowest. 2. Roads must be routed so as to avoid passing through wetlands and watercourses may only be approached at crossing points. Elsewhere a buffer strip of at least 25m in width must be adhered to. 3. During the site preparation process all soil material which is to be removed from the working area must be removed from that area. No material may be simply pushed out of the working area and into a watercourse or wetland. 4. The material which has been moved must be stockpiled or spoiled at a site which is at least 30 m away from the edge of the river macro-channel. 5. The road surface must be hardened to a standard which will prevent erosion and development of rainwater gullies. The use of a concreted surface or, at least, concrete strips, is recommended. 6. Herringbone drains to remove water from the road must be included at intervals not exceeding 30 m on the steeper slopes. 7. No road drains may discharge into an area within 20m of a watercourse or wetland. 8. All road verges and surrounds are to be fully stabilised and be revegetated with local indigenous grass species at the completion of construction. Stabilisation techniques should be biased toward “soft” engineering such as banks which are sloped to below the natural angle of repose of the material, and to vegetation cover. “Hard” solutions such as gabions and walls should only be used if no other option is available.	1	1	1	1	1	1	5	_	Low

Aquatic	Building of proposed facilities: Building operations entail importing a wide variety of construction materials but also the generation of wastes such as paper, plastics, food containers, cement bags, rubble, scrap materials, etc.	1	1	1	1	1	1	5	-	Low	1. Site preparation including the water pipeline trenches must include all soil management procedures with especial reference to not spoiling or stockpiling within 30m of a watercourse. 2. Pipeline trenches must be routed so as to avoid passing within 25m of the edge of any wetland other than watercourses which have to be crossed. 3. Building materials must all be stored within the site footprint. 4. During the construction phase, construction and domestic wastes must be collected in waste bins or skips that are located on site. The content of these must be removed on a daily basis to a collection point in the site camp from where the waste can be cleared on a weekly basis. The collected waste must be disposed of at a municipal landfill facility and proof thereof retained. 5. Appropriate skips or waste bins must be placed at a number of points around the working areas. 6. No waste may be disposed of on-site by any means including burying or burning. 7. Hazardous waste must be collected and stored in bins in the construction camp prior to being removed from the site by a registered service provider for disposal. The bins must have lids and must be marked as being hazardous. They must be stored in a designated and enclosed area, and may not be used for any other purpose. 8. All areas must be cleared of alien weed species which may appear and must be kept weed free in accordance with the nature reserve standards and procedures.	1	2	1	1	1	1	6	_	Low
Air/dust pollution	Dust could become a problem during construction, especially on windy days. Air pollution may occur in the vicinity of the site and the immediate surrounds during the construction phase as a result of: Exhaust fumes from heavy vehicles and machinery, in particular poorly serviced vehicles Dust from exposed surfaces and soil stockpiles picked up by wind Dust on haulage and access roads emitted into the air by construction vehicles Odours downstream of inappropriate and mismanaged chemical toilets	1	3	1	1	1	2	14	-	Low	1. All exposed stockpiles must be covered with hessian sheeting when not in use or dampened by a watercart at regular interval if in use. 2. The exposed areas must be dampened at regular intervals and more frequently during windy conditions. 3. Dust generating construction activities should be avoided during strong winds. 4. Management (including storage, transport, handling and disposal) of hazardous substances that have the potential to become airborne during construction should be carefully managed. 5. Soil loads in transit should be kept covered or wetted. 6. Servicing of any construction vehicles must occur off site to limit gaseous emissions. 7. Chemical toilets should be placed on site and must be maintained on a daily basis. 8. Burning of waste is forbidden. 9. A dust complaints register must be kept within the site for the entire construction phase. 10. These measures are contained within the EMP and must be monitored to ensure compliance.	1	2	1	1	1	2	12	_	Low
Socio Economic	Job creation	1	4	1	3	1	1	10	+	Low	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Noise	The generation of noise (from earth moving machinery, installation of the tanks etc.) during the construction phase may result in the disturbance. Noise generated by delivery vehicles, earth moving machinery and the workforce have the potential to impact negatively on surrounding residents. The negative impacts could result in an increase in stress and frustration and associated health implications. Disturbance may also be caused by construction starting too early or finishing too late. However, these impacts are likely to be sporadic and relatively short.	1	2	2	1	1	1	7	-	Low	1. Construction activities should only take place within agreed working hours. 2. A complaints register must be kept at all times. 3. Construction staff should be provided with training regarding noise prevention and antisocial behaviour/conduct.	1	1	2	1	1	1	6	_	Low
Aquatic	Spillage of hydrocarbons such as fuels and oils. Contamination of the watercourse and wetland areas by vehicles, plant or equipment leaking fuel, oils and other substances. Hydrocarbons are toxic to aquatic fauna and may be persistent in the aquatic system.	1	1	2	3	1	3	24	-	Medium	1. No fuelling of machines or plant may be done within 20 m of a watercourse channel or wetland. 2. Drip trays must be used during refuelling. 3. Any spillages, if they occur, in these areas must be contained and cleared up immediately. Contaminated soil must be stored in appropriate containers and then be removed to an approved disposal facility. 4. An emergency clean-up kit of suitable capacity and sealable soil storage drums must be on site at all times. 5. No plant or equipment will be stored/parked within 40m of the bank of any watercourse or wetland areas when not in operation. Plant and equipment will be parked at designated parking areas. 6. All plant and equipment must be checked on a daily basis for leaks, any plant that is found to be leaking will be removed off site for maintenance.	1	1	1	1	1	1	5	_	Low

Aquatic	Leakage or spillage from toilets and ablution facilities. Toilets and ablution facilities could spill or leak human wastes into the river	2	1	1	1	1	2	12	-	Low	1. During the construction process, chemical toilets must be provided for the building workers. 2. The capacity and functionality of the toilets must be monitored on a daily basis. 3. If, the during the monitoring, it is found that the tanks are at 80% of their capacity, they must be cleared within two days of the monitoring event. 4. The disposal of the sewage waste must be done by a registered service provider who will dispose of the material at an approved facility. 5. The permanent toilets should ideally be of a type which has low water usage so as to minimise percolation of waste water into the ground water system. 6. Where possible, such as in the tented camp, multiple tanks spread of over a wide area should be installed so as to spread the area over which percolation will occur. The spread may be further increased through widely dispersed soakaway facilities.	1	1	1	1	1	1	5	_	Low
Operational Phase																				
Socio Economic	Job creation	1	4	1	3	4	1	13	+	Low	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Loss of Agricultural Resources (Including Land Use)	The loss of current agricultural land use through altering the land use for alternative land uses.	1	1	3	1	1	1	7	_	Low	1. The dominant land use will not change as the land use is currently a protected game lodge.	1	1	3	1	1	1	7	_	Low
Loss of High Potential Soil Resources	The compaction, erosion, and contamination of high value soil resources which were not initially part of the construction impacts.	1	1	3	2	3	2	20	_	Low	1. Green Engineering structures should be considered to improve infiltration into soil profiles and minimise runoff volumes. 2. Water on the road should be diverted away as quickly as possible, to minimise the amount of water running directly from the road. The drainage must lead the water to vegetated filter strips, which remove particles and contaminants from the water. 3. Having more frequent drains on the approach to a water body ensures that the least amount of water is discharged directly into the water body and reduced sediment loading. 4. A water bar diverts water flowing down a surface (e.g., road) to one side. This reduces the volume of water that flows down the surface and the subsequent erosion that occurs. 5. Sediment basins and rock dams can be used to capture sediment from stormwater runoff before it leaves a site.	1	1	3	2	3	2	20	_	Low
Loss of High Potential Land Capability	The loss of high potential land capability through altering the land use for alternative land uses. As well as through excavation, compaction, erosion, and contamination of soil resources.	1	1	3	2	3	2	20	_	Low	1. The high potential land which will be impacted on is small and will have a low impact as the land is not used for agriculture.	1	1	3	2	3	2	20	_	Low

Erosion related impacts for operation phase	Erosion is currently occurring on the access road. The preferred routing access road us likely to have high erosion potential should proper stormwater control measures not be in place.	2	3	1	2	3	2	22	_	Low	1. All stormwater outflows must be protected with reno-mattresses and gabion baskets to reduce the effect of erosion on the access road. 2. Where possible, indigenous vegetation needs to be returned as soon as construction ceases. 3. Soil stockpiles need to be grassed with an indigenous mix and rehabilitated to prevent soil loss through wind and water erosion before operation phase begins. 4. Rehabilitation should take place as soon as construction is complete. 5. Operation phase should only begin once the ECO has deemed rehabilitation successful and mitigation measures have been implemented. 6. A six month check of the area should take place for the emergence erosion gulley's, and if gulley's emerge, will need to be rehabilitated immediately.	1	2	1	2	3	1	9	_	Low
Biodiversity loss due to operation phase	Biodiversity could be lost if rehabilitation measures are not implemented. This can be partly mitigated if rehabilitation is successful.	2	3	2	3	3	2	26	_	Medium	1. A post construction monitoring programme to ensure that rehabilitation efforts are successful and that edge effects are reduced. 2. Monthly monitoring of these sensitive areas should take place during the first year after construction to ensure that rehabilitation is successful. 3. Six monthly checks of the area should take place for the emergence of invader species.	1	2	1	2	3	2	18	_	Low
Vegetation	Establishment and spread of alien invasive plant species due disturbance vectors	1	3	2	3	3	2	24	_	Medium	1. Compile and implement Alien Invasive Management Plan. 2. Rehabilitate disturbed areas.	1	2	2	2	3	2	20	_	Low
Aquatic	Seepage from septic tanks. Movement of contaminated water from septic tanks	1	2	2	1	3	1	9	_	Low	1. This impact can only be mitigated in the construction phase through careful location and design of the toilet sites.	1	1	1	1	3	1	7	_	Low
Aquatic	Construction of new roads and upgrading of existing roads. Mobilisation of soil as a result of erosion at building sites or along road and pipeline routes	1	1	1	1	1	1	5	_	Low	1. All sites must be checked for any signs of soil erosion on at least a quarterly basis. 2. Any erosion found must be addressed immediately and be rehabilitated as is appropriate to the site. 3. Once the site has been repaired and revegetation done, an ongoing check must be undertaken for invasion by alien plant species. If any are found they are to be eradicated immediately.	1	1	1	1	1	1	5	_	Low
Decommissioning Phase																				
Loss of Agricultural Resources (Including Land Use)	The removal of infrastructure and rehabilitation to prior conditions	1	1	1	1	1	1	5	_	Low	1. It is not envisioned that the project will have a decommissioning phase. 2. The rehabilitation should not be an onerous task as the footprint area is small.	1	1	1	1	1	1	5	_	Low

Loss of High Potential Soil Resources	The removal of infrastructure and rehabilitation to prior conditions.	1	1	1	1	1	1	5	_	Low	1. It is not envisioned that the project will have a decommissioning phase. 2. Once surfaces have been exposed, they must immediately be protected from erosion, so limiting the source of the sediment. 3. Temporary diversion must be used to direct runoff from impervious areas to the sediment traps. 4. Sediment traps must be used in areas of concentrated runoff. 5. If soil contamination occurs (such as due to a spill) the soil must be removed from the site and disposed of appropriately.	1	1	1	1	1	1	5	_	Low
Loss of High Potential Land Capability	The removal of infrastructure and rehabilitation to prior conditions	1	1	1	1	1	1	5	_	Low	1. The high potential land which will be impacted on is small and will have a low impact as the land is not used for agriculture.	1	1	1	1	1	1	5	_	Low
Cumulative																					
Loss of Agricultural Resources (Including Land Use)	The cumulative loss of agricultural resources over the region through small or large projects impacting on the agriculture.	1	1	2	1	1	1	6	-	Low	1. No agricultural resources were identified within the project footprint.	1	1	2	1	1	1	6	_	Low
Loss of High Potential Soil Resources	The cumulative loss of high value soil resources over the region through small or large projects impacting on the soils.	1	1	2	2	3	1	9	-	Low	1. The footprint areas are small and the initial impact ratings were low. This will have a low cumulative impact.	1	1	2	2	3	1	9	_	Low
Loss of High Potential Land Capability	The cumulative loss of high potential land capability over the region through small or large projects impacting on the total land capability.	1	1	2	2	3	1	9	-	Low	1. The footprint areas are small and the initial impact ratings were low. This will have a low cumulative impact.	1	1	2	2	3	1	9	_	Low

16.2 Managers House

UKUWELA NATURE RESERVE: MANAGERS HOUSE																					
ENVIRONMENTAL PARAMETER	**ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE**	**ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION**									**RECOMMENDED MITIGATION MEASURES**	**ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION**								
		E	**P**	**R**	**L**	**D**	**I / M**	**TOTAL**	**STATUS (+ OR -)**	**S**		**E**	**P**	**R**	**L**	**D**	**I / M**	**TOTAL**	**STATUS (+ OR -)**	**S**
Planning Phase																					
Loss of Agricultural Resources (Including Land Use)	The loss of current agricultural land use through poor planning of new development footprints.	1	3	1	1	1	1	7	-	Low	1. Every effort must be made to avoid potential impacts from the outset of a project (e.g., through careful spatial or temporal placement of elements of infrastructure) to prevent or limit impacts to high potential soil resources.	1	1	1	1	1	1	5	_	Low
Loss of High Potential Soil Resources	The loss of high value soil resources through poor planning of new development footprints.	1	3	1	2	3	2	20	-	Low		1	1	1	2	3	2	16	_	Low
Loss of High Potential Land Capability	The loss of current agricultural land use through poor planning of new development footprints.	1	3	1	2	3	2	20	-	Low		1	1	1	2	3	2	16	_	Low
Construction Phase																					
Loss of Agricultural Resources (Including Land Use)	The loss of current agricultural land use through altering the land use for alternative land uses.	1	1	3	1	1	1	7	-	Low	1. No agricultural resources were identified within the project footprint.	1	1	3	1	1	1	7	_	Low
Loss of High Potential Soil Resources	The excavation, compaction, erosion, and contamination of high value soil resources.	1	2	3	2	3	2	22	-	Low	1. Topsoil that is removed during excavation must NEVER be buried or rendered unusable in any way (such as mixing it with spoils or being compacted by machinery). 2. During excavation soil must be excavated one layer at a time and stored in separate stockpiles so they can be returned in their natural order when the area is backfilled. This improves soil functions and improves the template for plant growth. 3. The footprint area must be kept to a minimum.	1	2	3	2	3	2	22	_	Low

											4. Where possible, plants should be cut down to ground level instead of being removed completely to stabilise the soil during land-clearing operations. 5. Once surfaces have been exposed, they must immediately be protected from erosion, so limiting the source of the sediment. 6. Temporary diversion must be used to direct runoff from impervious areas to the sediment traps. 7. Sediment traps must be used in areas of concentrated runoff. 8. If soil contamination occurs (such as due to a spill) the soil must be removed from the site and disposed of appropriately. 9. Green Engineering structures should be considered to improve infiltration into soil profiles and minimise runoff volumes.									
Loss of High Potential Land Capability	The loss of high potential land capability through altering the land use for alternative land uses. As well as through excavation, compaction, erosion, and contamination of soil resources.	1	1	3	2	3	2	20	-	Low	1. The high potential land which will be impacted on is small and will have a low impact as the land is not used for agriculture.	1	1	3	2	3	2	20	_	Low
Heritage	Impact on archaeological site DH01	1	1	3	4	3	1	12	-	Low	1. Area is to be monitored by a suitably qualified archaeologist after vegetation clearance and during any topsoil removal. A collection permit should be obtained so that any significant artefacts can be sampled. If needs be, the track can be altered if any features are noted.	1	1	3	4	3	1	12	_	Low
Indigenous natural vegetation	Loss, degradation or fragmentation of vegetation through direct clearing	1	3	1	2	2	2	18	-	Low	1. Footprint of the activity needs to be strictly adhered to. 2. A site specific Environmental Management Programme needs to be developed for the construction and operation phases. 3. An Environmental Control Officer (ECO) needs to be appointed for the duration of construction. 4. Permits for plants collection/removal need to be obtained prior to search and rescue operations. 5. Vegetation clearance in the construction phase is to be remove in a phased approach, as and when it becomes necessary as vegetation harbours fauna. 6. Sensitive areas need to be demarcated clearly before construction commences. 7. Areas outside of the construction zone are to be designated as “no-go areas.”	1	2	1	2	2	2	16	_	Low
Transformation of habitat for flora	Hard transformation of proposed access roads and accommodations will result in a marginal reduction in flora. The access roads being a linear activity will result in the disturbance of the soil surface, and this often leads to the establishment of alien invasive plant species.	1	3	2	3	3	3	36	-	Medium	1. Servitude widths need to be a strictly adhered to. 2. Where possible, indigenous vegetation needs to be retained. 3. Clearance for construction should be done in a phased approach, and rehabilitation should be done as soon as work has ceased along the section of routing. 4. Where possible, construction should occur in the dry season to prevent soil loss through stormwater. 5. Where possible, manual clearance of the vegetation should be done so as to prevent the unnecessary movement of machinery in no-go areas. 6. The contractor should implement an alien invasive control programme, particularly in areas where soil disturbance occurs. 7. Soil stockpiles need to be grassed with an indigenous mix or covered with shadecloth to prevent soil loss through wind and water erosion. 8. Strictly no trapping or hunting of fauna is allowed. 9. All open excavations need to be checked on a daily basis and any fauna that may be stranded will have to be caught and released by a qualified person. 10. Rehabilitation should take place as soon as construction of the section of line is complete.	1	2	1	2	2	2	16	_	Low

											11. Strictly no littering. The contractor should highlight this at daily toolbox talks and site clean-ups should occur on a daily occasion. 12. A mix of indigenous grass species, should be used for rehabilitation.									
Erosion related impacts	Vegetation binds and protects the soil surface, and when removed, increases erosion potential. This may lead to water and wind removing vital topsoil and blocking up drains and eventually clogging roadsides and drainage lines.	1	3	2	2	2	2	20	-	Low	1. All stormwater outflows must be protected with reno-mattresses and gabion baskets to reduce the effect of erosion on the access road. 2. Where possible, indigenous vegetation needs to be retained. 3. Vegetation should be cleared only when construction occurs in that section of the routing. 4. Soil stockpiles need to be grassed with an indigenous mix or covered with shadecloth to prevent soil loss through wind and water erosion. 5. Rehabilitation should take place as soon as construction is complete. 6. In areas of higher gradient, access roads should have erosion berms to prevent soil loss. 7. Construction activities should be limited to the winter months to prevent loss of soil to water runoff. 8. Spraying of the soil surface should occur when working in dusty conditions.	1	2	1	2	2	2	16	_	Low
Habitat transformation and fragmentation for fauna	Continued transformation of vegetation in the area will result in a marginal reduction in flora and fauna for the area. Disturbance of the soil surface and a leads to the establishment of alien invasive plant species. Continued transformation of the land results in habitat fragmentation, where edge effects decrease suitable habitat for a wide range of fauna in the area. This leads to an overall indirect decline in faunal diversity.	1	2	1	1	1	2	12	-	Low	1. Construction footprint needs to be a strictly adhered to. 2. Clearance of land and vegetation is not allowed, unless clearance occurs within the authorised project area. 3. Areas outside of the construction zone must be demarcated as “no-go” areas. 4. Where possible, indigenous vegetation needs to be retained. 5. Manual clearance of alien and invasive vegetation should be done so as to prevent the unnecessary movement of machinery in no-go areas. 6. An alien and invasive control programme should implemented, particularly in areas where soil disturbance has occurred. 7. Soil stockpiles need to be returned to the excavations, with the subsoil being placed first, followed by the topsoil. 8. Monthly ECO auditing should occur during rehabilitation of the site. Once rehabilitation is complete, one three month, and one six month follow up audit should be conducted to assess the state of rehabilitation.	1	2	1	1	1	1	6	_	Low

Paleontology	Uncovering of Significant Palaeontological Material	1	3	2	3	1	3	30	-	Medium	1. A PIA field survey will be required to determine the full extent of the fossil record. 2. It is a recommendation of this report that a suitably qualified palaeontologist visits this site to assess for the presence of fossils in the proposed development area. 3. Chance Finds Protocol to be adopted	1	2	2	1	1	2	14	_	Low
Aquatic	Construction of new roads and upgrading of existing roads: Mobilisation of soil which could be transported into watercourses by storm water flows	1	1	1	1	1	2	10	-	Low	1. Ideally the road construction will be done in the dry season when rainfall is at its lowest. 2. Roads must be routed so as to avoid passing through wetlands and watercourses may only be approached at crossing points. Elsewhere a buffer strip of at least 25m in width must be adhered to. 3. During the site preparation process all soil material which is to be removed from the working area must be removed from that area. No material may be simply pushed out of the working area and into a watercourse or wetland. 4. The material which has been moved must be stockpiled or spoiled at a site which is at least 30 m away from the edge of the river macro-channel. 5. The road surface must be hardened to a standard which will prevent erosion and development of rainwater gullies. The use of a concreted surface or, at least, concrete strips, is recommended. 6. Herringbone drains to remove water from the road must be included at intervals not exceeding 30 m on the steeper slopes. 7. No road drains may discharge into an area within 20m of a watercourse or wetland. 8. All road verges and surrounds are to be fully stabilised and be revegetated with local indigenous grass species at the completion of construction. Stabilisation techniques should be biased toward “soft” engineering such as banks which are sloped to below the natural angle of repose of the material, and to vegetation cover. “Hard” solutions such as gabions and walls should only be used if no other option is available.	1	1	1	1	1	1	5	_	Low

Aquatic	Building of proposed facilities: Building operations entail importing a wide variety of construction materials but also the generation of wastes such as paper, plastics, food containers, cement bags, rubble, scrap materials, etc.	1	1	1	1	1	1	5	-	Low	1. Site preparation including the water pipeline trenches must include all soil management procedures with especial reference to not spoiling or stockpiling within 30m of a watercourse. 2. Pipeline trenches must be routed so as to avoid passing within 25m of the edge of any wetland other than watercourses which have to be crossed. 3. Building materials must all be stored within the site footprint. 4. During the construction phase, construction and domestic wastes must be collected in waste bins or skips that are located on site. The content of these must be removed on a daily basis to a collection point in the site camp from where the waste can be cleared on a weekly basis. The collected waste must be disposed of at a municipal landfill facility and proof thereof retained. 5. Appropriate skips or waste bins must be placed at a number of points around the working areas. 6. No waste may be disposed of on-site by any means including burying or burning. 7. Hazardous waste must be collected and stored in bins in the construction camp prior to being removed from the site by a registered service provider for disposal. The bins must have lids and must be marked as being hazardous. They must be stored in a designated and enclosed area, and may not be used for any other purpose. 8. All areas must be cleared of alien weed species which may appear and must be kept weed free in accordance with the nature reserve standards and procedures.	1	2	1	1	1	1	6	_	Low
Aquatic	Leakage or spillage from toilets and ablution facilities. Toilets and ablution facilities could spill or leak human wastes into the river	2	1	1	1	1	2	12	-	Low	1. During the construction process, chemical toilets must be provided for the building workers. 2. The capacity and functionality of the toilets must be monitored on a daily basis. 3. If, the during the monitoring, it is found that the tanks are at 80% of their capacity, they must be cleared within two days of the monitoring event. 4. The disposal of the sewage waste must be done by a registered service provider who will dispose of the material at an approved facility. 5. The permanent toilets should ideally be of a type which has low water usage so as to minimise percolation of waste water into the ground water system. 6. Where possible, such as in the tented camp, multiple tanks spread of over a wide area should be installed so as to spread the area over which percolation will occur. The spread may be further increased through widely dispersed soakaway facilities.	1	1	1	1	1	1	5	_	Low
Aquatic	Spillage of hydrocarbons such as fuels and oils. Contamination of the watercourse and wetland areas by vehicles, plant or equipment leaking fuel, oils and other substances. Hydrocarbons are toxic to aquatic fauna and may be persistent in the aquatic system.	1	1	2	3	1	3	24	-	Medium	1. No fuelling of machines or plant may be done within 20 m of a watercourse channel or wetland. 2. Drip trays must be used during refuelling. 3. Any spillages, if they occur, in these areas must be contained and cleared up immediately. Contaminated soil must be stored in appropriate containers and then be removed to an approved disposal facility. 4. An emergency clean-up kit of suitable capacity and sealable soil storage drums must be on site at all times. 5. No plant or equipment will be stored/parked within 40m of the bank of any watercourse or wetland areas when not in operation. Plant and equipment will be parked at designated parking areas. 6. All plant and equipment must be checked on a daily basis for leaks, any plant that is found to be leaking will be removed off site for maintenance.	1	1	1	1	1	1	5	_	Low
Air/dust pollution	Dust could become a problem during construction, especially on windy days. Air pollution	1	3	1	1	1	2	14	-	Low	1. All exposed stockpiles must be covered with hessian sheeting when not in use or dampened by a watercart at regular interval if in use. 2. exposed areas must be dampened at regular intervals and more frequently during windy conditions.	1	2	1	1	1	2	12	_	Low

	may occur in the vicinity of the site and the immediate surrounds during the construction phase as a result of: Exhaust fumes from heavy vehicles and machinery, in particular poorly serviced vehicles Dust from exposed surfaces and soil stockpiles picked up by wind Dust on haulage and access roads emitted into the air by construction vehicles Odours downstream of inappropriate and mismanaged chemical toilets										3. Dust generating construction activities should be avoided during strong winds. 4. Management (including storage, transport, handling and disposal) of hazardous substances that have the potential to become airborne during construction should be carefully managed. 5. Soil loads in transit should be kept covered or wetted. 6. Servicing of any construction vehicles must occur off site to limit gaseous emissions. 7. Chemical toilets should be placed on site and must be maintained on a daily basis. 8. Burning of waste is forbidden. 9. A dust complaints register must be kept within the site for the entire construction phase. 10. These measures are contained within the EMP and must be monitored to ensure compliance.									
Socio Economic	Job creation	1	4	1	3	1	1	10	+	Low	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Noise	The generation of noise (from earth moving machinery, installation of the tanks etc.) during the construction phase may result in the disturbance. Noise generated by delivery vehicles, earth moving machinery and the workforce have the potential to impact negatively on surrounding residents. The negative impacts could result in an increase in stress and frustration and associated health implications. Disturbance may also be caused by construction starting too early or finishing too late. However, these impacts are likely to	1	2	2	1	1	1	7	-	Low	1. Construction activities should only take place within agreed working hours. 2. A complaints register must be kept at all times. 3. Construction staff should be provided with training regarding noise prevention and antisocial behaviour/conduct.	1	1	2	1	1	1	6	_	Low

	be sporadic and relatively short.																			
Operational Phase																				
Socio Economic	Job creation	1	4	1	3	4	1	13	+	Low	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Loss of Agricultural Resources (Including Land Use)	The loss of current agricultural land use through altering the land use for alternative land uses.	1	1	3	1	1	1	7	_	Low	1. The dominant land use will not change as the land use is currently a protected game lodge.	1	1	3	1	1	1	7	_	Low
Loss of High Potential Soil Resources	The compaction, erosion, and contamination of high value soil resources which were not initially part of the construction impacts.	1	1	3	2	3	2	20	_	Low	1. Green Engineering structures should be considered to improve infiltration into soil profiles and minimise runoff volumes. 2. Water on the road should be diverted away as quickly as possible, to minimise the amount of water running directly from the road. The drainage must lead the water to vegetated filter strips, which remove particles and contaminants from the water. 3. Having more frequent drains on the approach to a water body ensures that the least amount of water is discharged directly into the water body and reduced sediment loading. 4. A water bar diverts water flowing down a surface (e.g., road) to one side. This reduces the volume of water that flows down the surface and the subsequent erosion that occurs. 5. Sediment basins and rock dams can be used to capture sediment from stormwater runoff before it leaves a site.	1	1	3	2	3	2	20	_	Low
Loss of High Potential Land Capability	The loss of high potential land capability through altering the land use for alternative land uses. As well as through excavation, compaction, erosion, and contamination of soil resources.	1	1	3	2	3	2	20	_	Low	1. The high potential land which will be impacted on is small and will have a low impact as the land is not used for agriculture.	1	1	3	2	3	2	20	_	Low
Erosion related impacts for operation phase	Erosion is currently occurring on the access road. The preferred routing access road us likely to have high erosion potential should proper stormwater control measures not be in place.	2	3	1	2	3	2	22	_	Low	1. All stormwater outflows must be protected with reno-mattresses and gabion baskets to reduce the effect of erosion on the access road. 2. Where possible, indigenous vegetation needs to be returned as soon as construction ceases. 3. Soil stockpiles need to be grassed with an indigenous mix and rehabilitated to prevent soil loss through wind and water erosion before operation phase begins. 4. Rehabilitation should take place as soon as construction is complete. 5. Operation phase should only begin once the ECO has deemed rehabilitation successful and mitigation measures have been implemented. 6. A six month check of the area should take place for the emergence erosion gulley's, and if gulley's emerge, will need to be rehabilitated immediately.	1	2	1	2	3	1	9	_	Low

Biodiversity loss due to operation phase	Biodiversity could be lost if rehabilitation measures are not implemented. This can be partly mitigated if rehabilitation is successful.	2	3	2	3	3	2	26	_	Medium	1. A post construction monitoring programme to ensure that rehabilitation efforts are successful and that edge effects are reduced. 2. Monthly monitoring of these sensitive areas should take place during the first year after construction to ensure that rehabilitation is successful. 3. Six monthly checks of the area should take place for the emergence of invader species.	1	2	1	2	3	2	18	_	Low
Vegetation	Establishment and spread of alien invasive plant species due to disturbance vectors	1	3	2	3	3	2	24	_	Medium	1. Compile and implement Alien Invasive Management Plan. 2. Rehabilitate disturbed areas.	1	2	2	2	3	2	20	_	Low
Aquatic	Seepage from septic tanks. Movement of contaminated water from septic tanks	1	2	2	1	3	1	9	_	Low	1. This impact can only be mitigated in the construction phase through careful location and design of the toilet sites.	1	1	1	1	3	1	7	_	Low
Aquatic	Construction of new roads and upgrading of existing roads. Mobilisation of soil as a result of erosion at building sites or along road and pipeline routes	1	1	1	1	1	1	5	_	Low	1. All sites must be checked for any signs of soil erosion on at least a quarterly basis. 2. Any erosion found must be addressed immediately and be rehabilitated as is appropriate to the site. 3. Once the site has been repaired and revegetation done, an ongoing check must be undertaken for invasion by alien plant species. If any are found they are to be eradicated immediately.	1	1	1	1	1	1	5	_	Low
Decommissioning Phase																				
Loss of Agricultural Resources (Including Land Use)	The loss of current agricultural land use through altering the land use for alternative land uses.	1	1	1	1	1	1	5	–	Low	1. It is not envisioned that the project will have a decommissioning phase. 2. The rehabilitation should not be an onerous task as the footprint area is small.	1	1	1	1	1	1	5	_	Low
Loss of High Potential Soil Resources	The compaction, erosion, and contamination of high value soil resources which were not initially part of the construction impacts.	1	1	1	1	1	1	5	_	Low	1. It is not envisioned that the project will have a decommissioning phase. 2. Once surfaces have been exposed, they must immediately be protected from erosion, so limiting the source of the sediment. 3. Temporary diversion must be used to direct runoff from impervious areas to the sediment traps. 4. Sediment traps must be used in areas of concentrated runoff. 5. If soil contamination occurs (such as due to a spill) the soil must be removed from the site and disposed of appropriately.	1	1	1	1	1	1	5	_	Low

Loss of High Potential Land Capability	The loss of high potential land capability through altering the land use for alternative land uses. As well as through excavation, compaction, erosion, and contamination of soil resources.	1	1	1	1	1	1	5	_	Low	1. The high potential land which will be impacted on is small and will have a low impact as the land is not used for agriculture.	1	1	1	1	1	1	5	_	Low
Cumulative																				
Loss of Agricultural Resources (Including Land Use)	The cumulative loss of agricultural resources over the region through small or large projects impacting on the agriculture.	1	1	2	1	1	1	6	-	Low	1. No agricultural resources were identified within the project footprint.	1	1	2	1	1	1	6	_	Low
Loss of High Potential Soil Resources	The cumulative loss of high value soil resources over the region through small or large projects impacting on the soils.	1	1	2	2	3	1	9	-	Low	1. The footprint areas are small and the initial impact ratings were low. This will have a low cumulative impact.	1	1	2	2	3	1	9	_	Low
Loss of High Potential Land Capability	The cumulative loss of high potential land capability over the region through small or large projects impacting on the total land capability.	1	1	2	2	3	1	9	-	Low	1. The footprint areas are small and the initial impact ratings were low. This will have a low cumulative impact.	1	1	2	2	3	1	9	_	Low

16.3 Tented Camp

UKUWELA NATURE RESERVE: TENTED CAMP																					
ENVIRONMENTAL PARAMETER	**ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE**	**ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION**									**RECOMMENDED MITIGATION MEASURES**	**ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION**								
		E	**P**	**R**	**L**	**D**	**I / M**	**TOTAL**	**STATUS (+ OR -)**	**S**		**E**	**P**	**R**	**L**	**D**	**I / M**	**TOTAL**	**STATUS (+ OR -)**	**S**
Planning Phase: None																					
Construction Phase																					
Indigenous natural vegetation	Loss, degradation or fragmentation of vegetation through direct clearing	1	3	1	2	2	2	18	-	Low	1. Footprint of the activity needs to be strictly adhered to 2. A site specific Environmental Management Programme needs to be developed for the construction and operation phases. 3. An Environmental Control Officer (ECO) needs to be appointed for the duration of construction. 4. Permits for plants collection/removal need to be obtained prior to search and rescue operations. 5. Vegetation clearance in the construction phase is to be remove in a phased approach, as and when it becomes necessary as vegetation harbours fauna. 6. Sensitive areas need to be demarcated clearly before construction commences. 7. Areas outside of the construction zone are to be designated as “no-go areas.”	1	2	1	2	2	2	16	_	Low
Transformation of habitat for flora	Hard transformation of proposed access roads and accommodations will result in a marginal reduction in flora. The access roads being a linear activity will result in the disturbance of the soil surface, and this often leads to the establishment of alien invasive plant species.	1	3	2	3	3	3	36	-	Medium	1. Servitude widths need to be a strictly adhered to. 2. Where possible, indigenous vegetation needs to be retained. 3. Clearance for construction should be done in a phased approach, and rehabilitation should be done as soon as work has ceased along the section of routing. 4. Where possible, construction should occur in the dry season to prevent soil loss through stormwater. 5. Where possible, manual clearance of the vegetation should be done so as to prevent the unnecessary movement of machinery in no-go areas. 6. The contractor should implement an alien invasive control programme, particularly in areas where soil disturbance occurs. Soil stockpiles need to be grassed with an indigenous mix or covered with shadecloth to prevent soil loss through wind and water erosion. 7. Strictly no trapping or hunting of fauna is allowed. 8. All open excavations need to be checked on a daily basis and any fauna that may be stranded will have to be caught and released by a qualified person. 9. Rehabilitation should take place as soon as construction of the section of line is complete. 10. Strictly no littering. The contractor should highlight this at daily toolbox talks and site clean-ups should occur on a daily occasion. 11. A mix of indigenous grass species, should be used for rehabilitation.	1	2	1	2	2	2	16	_	Low

Erosion related impacts	Vegetation binds and protects the soil surface, and when removed, increases erosion potential. This may lead to water and wind removing vital topsoil and blocking up drains and eventually clogging roadsides and drainage lines.	1	3	2	2	2	2	20	-	Low	1. All stormwater outflows must be protected with reno-mattresses and gabion baskets to reduce the effect of erosion on the access road. 2. Where possible, indigenous vegetation needs to be retained. 3. Vegetation should be cleared only when construction occurs in that section of the routing. 4. Soil stockpiles need to be grassed with an indigenous mix or covered with shadecloth to prevent soil loss through wind and water erosion. 5. Rehabilitation should take place as soon as construction is complete. 6. In areas of higher gradient, access roads should have erosion berms to prevent soil loss. 7. Construction activities should be limited to the winter months to prevent loss of soil to water runoff. 8. Spraying of the soil surface should occur when working in dusty conditions.	1	2	1	2	2	2	16	_	Low
Habitat transformation and fragmentation for fauna	Continued transformation of vegetation in the area will result in a marginal reduction in flora and fauna for the area. Disturbance of the soil surface and a leads to the establishment of alien invasive plant species. Continued transformation of the land results in habitat fragmentation, where edge effects decrease suitable habitat for a wide range of fauna in the area. This leads to an overall indirect decline in faunal diversity.	1	2	1	1	1	2	12	-	Low	1. Construction footprint needs to be a strictly adhered to. 2. Clearance of land and vegetation is not allowed, unless clearance occurs within the authorised project area. 3. Areas outside of the construction zone must be demarcated as “no-go” areas. 4. Where possible, indigenous vegetation needs to be retained. 5. Manual clearance of alien and invasive vegetation should be done so as to prevent the unnecessary movement of machinery in no-go areas. 6. An alien and invasive control programme should implemented, particularly in areas where soil disturbance has occurred. 7. Soil stockpiles need to be returned to the excavations, with the subsoil being placed first, followed by the topsoil. 8. Monthly ECO auditing should occur during rehabilitation of the site. Once rehabilitation is complete, one three month, and one six month follow up audit should be conducted to assess the state of rehabilitation.	1	2	1	1	1	1	6	_	Low
Heritage	Impact on archaeological site DH01	1	1	3	4	3	1	12	-	Low	1. Area is to be monitored by a suitably qualified archaeologist after vegetation clearance and during any topsoil removal. A collection permit should be obtained so that any significant artefacts can be sampled. If needs be, the track can be altered if any features are noted.	1	1	3	4	3	1	12	_	Low
Paleontology	Uncovering of Significant Palaeontological Material	1	3	2	3	1	3	30	-	Medium	1. A PIA field survey will be required to determine the full extent of the fossil record. 2. It is a recommendation of this report that a suitably qualified palaeontologist visits this site to assess for the presence of fossils in the proposed development area. 3. Chance Finds Protocol to be adopted	1	2	2	1	1	2	14	_	Low

Aquatic	Construction of new roads and upgrading of existing roads: Mobilisation of soil which could be transported into watercourses by storm water flows	1	2	2	2	1	2	16	-	Low	4. Ideally the road construction will be done in the dry season when rainfall is at its lowest. 5. Roads must be routed so as to avoid passing through wetlands and watercourses may only be approached at crossing points. Elsewhere a buffer strip of at least 25m in width must be adhered to. 6. During the site preparation process all soil material which is to be removed from the working area must be removed from that area. No material may be simply pushed out of the working area and into a watercourse or wetland. 7. The material which has been moved must be stockpiled or spoiled at a site which is at least 30 m away from the edge of the river macro-channel. 8. The road surface must be hardened to a standard which will prevent erosion and development of rainwater gullies. The use of a concreted surface or, at least, concrete strips, is recommended. 9. Herringbone drains to remove water from the road must be included at intervals not exceeding 30 m on the steeper slopes. 10. No road drains may discharge into an area within 20m of a watercourse or wetland. 11. All road verges and surrounds are to be fully stabilised and be revegetated with local indigenous grass species at the completion of construction. Stabilisation techniques should be biased toward “soft” engineering such as banks which are sloped to below the natural angle of repose of the material, and to vegetation cover. “Hard” solutions such as gabions and walls should only be used if no other option is available.	1	1	1	1	1	1	5	_	Low
Aquatic	Building of proposed facilities: Building operations entail importing a wide variety of construction materials but also the generation of wastes such as paper, plastics, food containers, cement bags, rubble, scrap materials, etc.	1	2	2	1	1	1	7	-	Low	1. Site preparation including the water pipeline trenches must include all soil management procedures with especial reference to not spoiling or stockpiling within 30m of a watercourse. 2. Pipeline trenches must be routed so as to avoid passing within 25m of the edge of any wetland other than watercourses which have to be crossed. 3. Building materials must all be stored within the site footprint. 4. During the construction phase, construction and domestic wastes must be collected in waste bins or skips that are located on site. The content of these must be removed on a daily basis to a collection point in the site camp from where the waste can be cleared on a weekly basis. The collected waste must be disposed of at a municipal landfill facility and proof thereof retained. 5. Appropriate skips or waste bins must be placed at a number of points around the working areas. 6. No waste may be disposed of on-site by any means including burying or burning. 7. Hazardous waste must be collected and stored in bins in the construction camp prior to being removed from the site by a registered service provider for disposal. The bins must have lids and must be marked as being hazardous. They must be stored in a designated and enclosed area, and may not be used for any other purpose. 8. All areas must be cleared of alien weed species which may appear and must be kept weed free in accordance with the nature reserve standards and procedures.	1	2	1	1	1	1	6	_	Low
Aquatic	Spillage of hydrocarbons such as fuels and oils. Contamination of the watercourse and wetland areas by vehicles, plant or equipment leaking fuel, oils and other substances. Hydrocarbons are toxic to aquatic fauna and may be persistent in the aquatic system.	1	1	2	3	1	3	24	-	Medium	1. No fuelling of machines or plant may be done within 20 m of a watercourse channel or wetland. 2. Drip trays must be used during refuelling. 3. Any spillages, if they occur, in these areas must be contained and cleared up immediately. Contaminated soil must be stored in appropriate containers and then be removed to an approved disposal facility. 4. An emergency clean-up kit of suitable capacity and sealable soil storage drums must be on site at all times. 5. No plant or equipment will be stored/parked within 40m of the bank of any watercourse or wetland areas when not in operation. Plant and equipment will be parked at designated parking areas. 6. All plant and equipment must be checked on a daily basis for leaks, any plant that is found to be leaking will be removed off site for maintenance.	2	1	1	1	1	1	6	_	Low
Aquatic	Leakage or spillage from toilets and ablution facilities. Toilets and ablution facilities could spill or leak human wastes into the river	2	1	1	1	1	2	12	-	Low	1. During the construction process, chemical toilets must be provided for the building workers. 2. The capacity and functionality of the toilets must be monitored on a daily basis. 3. If, the during the monitoring, it is found that the tanks are at 80% of their capacity, they must be cleared within two days of the monitoring event. 4. The disposal of the sewage waste must be done by a registered service provider who will dispose of the material at an approved facility. 5. The permanent toilets should ideally be of a type which has low water usage so as to minimise percolation of waste water into the ground water system.	1	1	1	1	1	1	5	_	Low

											6. Where possible, such as in the tented camp, multiple tanks spread of over a wide area should be installed so as to spread the area over which percolation will occur. The spread may be further increased through widely dispersed soakaway facilities.									
Socio Economic	Dust could become a problem during construction, especially on windy days. Air pollution may occur in the vicinity of the site and the immediate surrounds during the construction phase as a result of: Exhaust fumes from heavy vehicles and machinery, in particular poorly serviced vehicles Dust from exposed surfaces and soil stockpiles picked up by wind Dust on haulage and access roads emitted into the air by construction vehicles Odours downstream of inappropriate and mismanaged chemical toilets	1	3	1	1	1	2	14	-	Low	1. All exposed stockpiles must be covered with hessian sheeting when not in use or dampened by a watercart at regular interval if in use. 2. The exposed areas must be dampened at regular intervals and more frequently during windy conditions. 3. Dust generating construction activities should be avoided during strong winds. 4. Management (including storage, transport, handling and disposal) of hazardous substances that have the potential to become airborne during construction should be carefully managed. 5. Soil loads in transit should be kept covered or wetted. 6. Servicing of any construction vehicles must occur off site to limit gaseous emissions. 7. Chemical toilets should be placed on site and must be maintained on a daily basis. 8. Burning of waste is forbidden. 9. A dust complaints register must be kept within the site for the entire construction phase. 10. These measures are contained within the EMP and must be monitored to ensure compliance.	1	2	1	1	1	2	12	_	Low
Socio Economic	Job creation	1	4	1	3	1	1	10	+	Low	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Socio Economic: Noise	The generation of noise (from earth moving machinery, installation of the tanks etc.) during the construction phase may result in the disturbance. Noise generated by delivery vehicles, earth moving machinery and the workforce have the potential to impact negatively on surrounding residents. The negative impacts could result in an	1	2	2	1	1	1	7	-	Low	1. Construction activities should only take place within agreed working hours. 2. A complaints register must be kept at all times. 3. Construction staff should be provided with training regarding noise prevention and antisocial behaviour/conduct.	1	1	2	1	1	1	6	_	Low

	increase in stress and frustration and associated health implications. Disturbance may also be caused by construction starting too early or finishing too late. However, these impacts are likely to be sporadic and relatively short.																			
Operational Phase																				
Socio Economic	Job creation	1	4	1	3	4	1	13	+	Low	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Erosion related impacts for operation phase	Erosion is currently occurring on the access road. The preferred routing access road us likely to have high erosion potential should proper stormwater control measures not be in place.	2	3	1	2	3	2	22	_	Low	1. All stormwater outflows must be protected with reno-mattresses and gabion baskets to reduce the effect of erosion on the access road. 2. Where possible, indigenous vegetation needs to be returned as soon as construction ceases. 3. Soil stockpiles need to be grassed with an indigenous mix and rehabilitated to prevent soil loss through wind and water erosion before operation phase begins. 4. Rehabilitation should take place as soon as construction is complete. 5. Operation phase should only begin once the ECO has deemed rehabilitation successful and mitigation measures have been implemented. 6. A six month check of the area should take place for the emergence erosion gulley's, and if gulley's emerge, will need to be rehabilitated immediately.	1	2	1	2	3	1	9	_	Low
Biodiversity loss due to operation phase	Biodiversity could be lost if rehabilitation measures are not implemented. This can be partly mitigated if rehabilitation is successful.	2	3	2	3	3	2	26	_	Medium	1. A post construction monitoring programme to ensure that rehabilitation efforts are successful and that edge effects are reduced. 2. Monthly monitoring of these sensitive areas should take place during the first year after construction to ensure that rehabilitation is successful. 3. Six monthly checks of the area should take place for the emergence of invader species.	1	2	1	2	3	2	18	_	Low
Vegetation	Establishment and spread of alien invasive plant species due disturbance vectors	1	3	2	3	3	2	24	_	Medium	1. Compile and implement Alien Invasive Management Plan. 2. Rehabilitate disturbed areas.	1	2	2	2	3	2	20	_	Low
Aquatic	Seepage from septic tanks. Movement of contaminated water from septic tanks	2	3	2	2	3	2	24	_	Medium	1. This impact can only be mitigated in the construction phase through careful location and design of the toilet sites.	2	1	1	1	3	1	8	_	Low
Aquatic	Construction of new roads and upgrading of existing roads. Mobilisation of soil as a result of erosion at building sites or along road	1	2	1	2	1	1	7	_	Low	1. All sites must be checked for any signs of soil erosion on at least a quarterly basis. 2. Any erosion found must be addressed immediately and be rehabilitated as is appropriate to the site. 3. Once the site has been repaired and revegetation done, an ongoing check must be undertaken for invasion by alien plant species. If any are found they are to be eradicated immediately.	1	1	1	1	1	1	5	_	Low

	and pipeline routes.																				
Decommissioning Phase																					
Wetland/ Aquatic	When the facility is eventually upgraded or decommissioned the same objective of protecting the river and the wetlands remains and so the management and mitigation measures listed above should be referred to as guidelines.																				

16.4 Ukuwela Donor House

UKUWELA NATURE RESERVE: DONOR HOUSE																					
ENVIRONMENTAL PARAMETER	**ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE**	**ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION**									**RECOMMENDED MITIGATION MEASURES**	**ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION**								
		E	**P**	**R**	**L**	**D**	**I / M**	**TOTAL**	**STATUS (+ OR -)**	**S**		**E**	**P**	**R**	**L**	**D**	**I / M**	**TOTAL**	**STATUS (+ OR -)**	**S**
Planning Phase																					
Loss of Agricultural Resources (Including Land Use)	The loss of current agricultural land use through poor planning of new development footprints.	1	3	1	1	1	1	7	-	Low	1. Every effort must be made to avoid potential impacts from the outset of a project (e.g., through careful spatial or temporal placement of elements of infrastructure) to prevent or limit impacts to high potential soil resources.	1	1	1	1	1	1	5	_	Low
Loss of High Potential Soil Resources	The loss of high value soil resources through poor planning of new development footprints.	1	3	1	2	3	2	20	-	Low		1	1	1	2	3	2	16	_	Low
Loss of High Potential Land Capability	The loss of current agricultural land use through poor planning of new development footprints.	1	3	1	2	3	2	20	-	Low		1	1	1	2	3	2	16	_	Low
Construction Phase																					

Loss of Agricultural Resources (Including Land Use)	The loss of current agricultural land use through altering the land use for alternative land uses.	1	1	3	1	1	1	7	-	Low	1. No agricultural resources were identified within the project footprint.	1	1	3	1	1	1	7	_	Low
Loss of High Potential Soil Resources	The excavation, compaction, erosion, and contamination of high value soil resources.	1	2	3	2	3	2	22	-	Low	1. Topsoil that is removed during excavation must NEVER be buried or rendered unusable in any way (such as mixing it with spoils or being compacted by machinery). 2. During excavation soil must be excavated one layer at a time and stored in separate stockpiles so they can be returned in their natural order when the area is backfilled. This improves soil functions and improves the template for plant growth. 3. The footprint area must be kept to a minimum. 4. Where possible, plants should be cut down to ground level instead of being removed completely to stabilise the soil during land-clearing operations. 5. Once surfaces have been exposed, they must immediately be protected from erosion, so limiting the source of the sediment. 6. Temporary diversion must be used to direct runoff from impervious areas to the sediment traps. 7. Sediment traps must be used in areas of concentrated runoff. 8. If soil contamination occurs (such as due to a spill) the soil must be removed from the site and disposed of appropriately. 9. Green Engineering structures should be considered to improve infiltration into soil profiles and minimise runoff volumes.	1	2	3	2	3	2	22	_	Low
Loss of High Potential Land Capability	The loss of high potential land capability through altering the land use for alternative land uses. As well as through excavation, compaction, erosion, and contamination of soil resources.	1	1	3	2	3	2	20	-	Low	1. The high potential land which will be impacted on is small and will have a low impact as the land is not used for agriculture.	1	1	3	2	3	2	20	_	Low
Heritage	Impact on archaeological site DH01	1	1	3	4	3	1	12	-	Low	1. Area is to be monitored by a suitably qualified archaeologist after vegetation clearance and during any topsoil removal. A collection permit should be obtained so that any significant artefacts can be sampled. If needs be, the track can be altered if any features are noted.	1	1	3	4	3	1	12	_	Low
Indigenous natural vegetation	Loss, degradation or fragmentation of vegetation through direct clearing	1	3	1	2	2	2	18	-	Low	1. Footprint of the activity needs to be strictly adhered to. 2. A site specific Environmental Management Programme needs to be developed for the construction and operation phases. 3. An Environmental Control Officer (ECO) needs to be appointed for the duration of construction. 4. Permits for plants collection/removal need to be obtained prior to search and rescue operations. 5. Vegetation clearance in the construction phase is to be remove in a phased approach, as and when it becomes necessary as vegetation harbours fauna. 6. Sensitive areas need to be demarcated clearly before construction commences. 7. Areas outside of the construction zone are to be designated as “no-go areas.”	1	2	1	2	2	2	16	_	Low

Transformation of habitat for flora	Hard transformation of proposed access roads and accommodations will result in a marginal reduction in flora. The access roads being a linear activity will result in the disturbance of the soil surface, and this often leads to the establishment of alien invasive plant species.	1	3	2	3	3	3	36	-	Medium	1. Servitude widths need to be a strictly adhered to. 2. Where possible, indigenous vegetation needs to be retained. 3. Clearance for construction should be done in a phased approach, and rehabilitation should be done as soon as work has ceased along the section of routing. 4. Where possible, construction should occur in the dry season to prevent soil loss through stormwater. 5. Where possible, manual clearance of the vegetation should be done so as to prevent the unnecessary movement of machinery in no-go areas. 6. The contractor should implement an alien invasive control programme, particularly in areas where soil disturbance occurs. 7. Soil stockpiles need to be grassed with an indigenous mix or covered with shadecloth to prevent soil loss through wind and water erosion. 8. Strictly no trapping or hunting of fauna is allowed. 9. All open excavations need to be checked on a daily basis and any fauna that may be stranded will have to be caught and released by a qualified person. 10. Rehabilitation should take place as soon as construction of the section of line is complete. 11. Strictly no littering. The contractor should highlight this at daily toolbox talks and site clean-ups should occur on a daily occasion. 12. A mix of indigenous grass species, should be used for rehabilitation.	1	2	1	2	2	2	16	_	Low
Erosion related impacts	Vegetation binds and protects the soil surface, and when removed, increases erosion potential. This may lead to water and wind removing vital topsoil and blocking up drains and eventually clogging roadsides and drainage lines.	1	3	2	2	2	2	20	-	Low	1. All stormwater outflows must be protected with reno-mattresses and gabion baskets to reduce the effect of erosion on the access road. 2. Where possible, indigenous vegetation needs to be retained. 3. Vegetation should be cleared only when construction occurs in that section of the routing. 4. Soil stockpiles need to be grassed with an indigenous mix or covered with shadecloth to prevent soil loss through wind and water erosion. 5. Rehabilitation should take place as soon as construction is complete. 6. In areas of higher gradient, access roads should have erosion berms to prevent soil loss. 7. Construction activities should be limited to the winter months to prevent loss of soil to water runoff. 8. Spraying of the soil surface should occur when working in dusty conditions.	1	2	1	2	2	2	16	_	Low
Habitat transformation and fragmentation for fauna	Continued transformation of vegetation in the area will result in a marginal reduction in flora and fauna for the area. Disturbance of the soil surface and a leads to the establishment of alien invasive plant species. Continued transformation of the land results in habitat fragmentation, where edge effects decrease suitable habitat for a wide range of fauna in the area. This leads to an overall indirect decline in faunal diversity.	1	2	1	1	1	2	12	-	Low	1. Construction footprint needs to be a strictly adhered to. 2. Clearance of land and vegetation is not allowed, unless clearance occurs within the authorised project area. 3. Areas outside of the construction zone must be demarcated as “no-go” areas. 4. Where possible, indigenous vegetation needs to be retained. 5. Manual clearance of alien and invasive vegetation should be done so as to prevent the unnecessary movement of machinery in no-go areas. 6. An alien and invasive control programme should implemented, particularly in areas where oil disturbance has occurred. 7. Soil stockpiles need to be returned to the excavations, with the subsoil being placed first, followed by the topsoil. 8. Monthly ECO auditing should occur during rehabilitation of the site. Once rehabilitation is complete, one three month, and one six month follow up audit should be conducted to assess the state of rehabilitation.	1	2	1	1	1	1	6	–	Low

Paleontology	Uncovering of Significant Palaeontological Material	1	3	2	3	1	3	30	-	Medium	1. A PIA field survey will be required to determine the full extent of the fossil record. 2. It is a recommendation of this report that a suitably qualified palaeontologist visits this site to assess for the presence of fossils in the proposed development area. 3. Chance Finds Protocol to be adopted	1	2	2	1	1	2	14	_	Low
Aquatic	Construction of new roads and upgrading of existing roads: Mobilisation of soil which could be transported into watercourses by storm water flows	1	1	1	1	1	2	10	-	Low	1. Ideally the road construction will be done in the dry season when rainfall is at its lowest. 2. Roads must be routed so as to avoid passing through wetlands and watercourses may only be approached at crossing points. Elsewhere a buffer strip of at least 25m in width must be adhered to. 3. During the site preparation process all soil material which is to be removed from the working area must be removed from that area. No material may be simply pushed out of the working area and into a watercourse or wetland. 4. The material which has been moved must be stockpiled or spoiled at a site which is at least 30 m away from the edge of the river macro-channel. 5. The road surface must be hardened to a standard which will prevent erosion and development of rainwater gullies. The use of a concreted surface or, at least, concrete strips, is recommended. 6. Herringbone drains to remove water from the road must be included at intervals not exceeding 30 m on the steeper slopes. 7. No road drains may discharge into an area within 20m of a watercourse or wetland. 8. All road verges and surrounds are to be fully stabilised and be revegetated with local indigenous grass species at the completion of construction. Stabilisation techniques should be biased toward “soft” engineering such as banks which are sloped to below the natural angle of repose of the material, and to vegetation cover. “Hard” solutions such as gabions and walls should only be used if no other option is available.	1	1	1	1	1	1	5	_	Low
Aquatic	Building of proposed facilities: Building operations entail importing a wide variety of construction materials but also the generation of wastes such as paper, plastics, food containers, cement bags, rubble, scrap materials, etc.	1	1	1	1	1	1	5	-	Low	1. Site preparation including the water pipeline trenches must include all soil management procedures with especial reference to not spoiling or stockpiling within 30m of a watercourse. 2. Pipeline trenches must be routed so as to avoid passing within 25m of the edge of any wetland other than watercourses which have to be crossed. 3. Building materials must all be stored within the site footprint. 4. During the construction phase, construction and domestic wastes must be collected in waste bins or skips that are located on site. The content of these must be removed on a daily basis to a collection point in the site camp from where the waste can be cleared on a weekly basis. The collected waste must be disposed of at a municipal landfill facility and proof thereof retained. 5. Appropriate skips or waste bins must be placed at a number of points around the working areas. 6. No waste may be disposed of on-site by any means including burying or burning. 7. Hazardous waste must be collected and stored in bins in the construction camp prior to being removed from the site by a registered service provider for disposal. The bins must have lids and must be marked as being hazardous. They must be stored in a designated and enclosed area, and may not be used for any other purpose. 8. All areas must be cleared of alien weed species which may appear and must be kept weed free in accordance with the nature reserve standards and procedures.	1	2	1	1	1	1	6	_	Low
Aquatic	Leakage or spillage from toilets and ablution facilities. Toilets and ablution facilities could spill or leak human wastes into the river	2	1	1	1	1	2	12	-	Low	1. During the construction process, chemical toilets must be provided for the building workers. 2. The capacity and functionality of the toilets must be monitored on a daily basis. 3. If, the during the monitoring, it is found that the tanks are at 80% of their capacity, they must be cleared within two days of the monitoring event. 4. The disposal of the sewage waste must be done by a registered service provider who will dispose of the material at an approved facility. 5. The permanent toilets should ideally be of a type which has low water usage so as to minimise percolation of waste water into the ground water system. 6. Where possible, such as in the tented camp, multiple tanks spread of over a wide area should be installed so as to spread the area over which percolation will occur. The spread may be further increased through widely dispersed soakaway facilities.	1	1	1	1	1	1	5	_	Low

Aquatic	Spillage of hydrocarbons such as fuels and oils. Contamination of the watercourse and wetland areas by vehicles, plant or equipment leaking fuel, oils and other substances. Hydrocarbons are toxic to aquatic fauna and may be persistent in the aquatic system.	1	1	2	3	1	3	24	-	Medium	7. No fuelling of machines or plant may be done within 20 m of a watercourse channel or wetland. 8. Drip trays must be used during refuelling. 9. Any spillages, if they occur, in these areas must be contained and cleared up immediately. Contaminated soil must be stored in appropriate containers and then be removed to an approved disposal facility. 10. An emergency clean-up kit of suitable capacity and sealable soil storage drums must be on site at all times. 11. No plant or equipment will be stored/parked within 40m of the bank of any watercourse or wetland areas when not in operation. Plant and equipment will be parked at designated parking areas. 12. All plant and equipment must be checked on a daily basis for leaks, any plant that is found to be leaking will be removed off site for maintenance.	1	1	1	1	1	1	5	_	Low
Socio Economic	Air/dust pollution	1	3	1	1	1	2	14	-	Low	1. All exposed stockpiles must be covered with hessian sheeting when not in use or dampened by a watercart at regular interval if in use. 2. The exposed areas must be dampened at regular intervals and more frequently during windy conditions. 3. Dust generating construction activities should be avoided during strong winds. 4. Management (including storage, transport, handling and disposal) of hazardous substances that have the potential to become airborne during construction should be carefully managed. 5. Soil loads in transit should be kept covered or wetted. 6. Servicing of any construction vehicles must occur off site to limit gaseous emissions. 7. Chemical toilets should be placed on site and must be maintained on a daily basis. 8. Burning of waste is forbidden. 9. A dust complaints register must be kept within the site for the entire construction phase. 10. These measures are contained within the EMP and must be monitored to ensure compliance.	1	2	1	1	1	2	12	_	Low
Socio Economic	Job creation	1	4	1	3	1	1	10	+	Low	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Socio Economic: Noise	The generation of noise (from earth moving machinery, installation of the tanks etc.) during the construction phase may result in the disturbance. Noise generated by delivery vehicles, earth moving machinery and the workforce have the potential to impact negatively on surrounding residents. The negative impacts could result in an increase in stress and frustration and associated health implications. Disturbance may also be caused by construction starting too early or finishing too late. However, these	1	2	2	1	1	1	7	-	Low	1. Construction activities should only take place within agreed working hours. 2. A complaints register must be kept at all times. 3. Construction staff should be provided with training regarding noise prevention and antisocial behaviour/conduct.	1	1	2	1	1	1	6	–	Low

	impacts are likely to be sporadic and relatively short.																				
Operational Phase																					
Socio Economic	Job creation	1	4	1	3	4	1	13	+	Low	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Loss of Agricultural Resources (Including Land Use)	The loss of current agricultural land use through altering the land use for alternative land uses.	1	1	3	1	1	1	7	_	Low	1. The dominant land use will not change as the land use is currently a protected game lodge.	1	1	3	1	1	1	7	_	Low
Loss of High Potential Soil Resources	The compaction, erosion, and contamination of high value soil resources which were not initially part of the construction impacts.	1	1	3	2	3	2	20	_	Low	1. Green Engineering structures should be considered to improve infiltration into soil profiles and minimise runoff volumes. 2. Water on the road should be diverted away as quickly as possible, to minimise the amount of water running directly from the road. The drainage must lead the water to vegetated filter strips, which remove particles and contaminants from the water. 3. Having more frequent drains on the approach to a water body ensures that the least amount of water is discharged directly into the water body and reduced sediment loading. 4. A water bar diverts water flowing down a surface (e.g., road) to one side. This reduces the volume of water that flows down the surface and the subsequent erosion that occurs. 5. Sediment basins and rock dams can be used to capture sediment from stormwater runoff before it leaves a site.	1	1	3	2	3	2	20	_	Low
Loss of High Potential Land Capability	The loss of high potential land capability through altering the land use for alternative land uses. As well as through excavation, compaction, erosion, and contamination of soil resources.	1	1	3	2	3	2	20	_	Low	1. The high potential land which will be impacted on is small and will have a low impact as the land is not used for agriculture.	1	1	3	2	3	2	20	_	Low

Erosion related impacts for operation phase	Erosion is currently occurring on the access road. The preferred routing access road us likely to have high erosion potential should proper stormwater control measures not be in place.	2	3	1	2	3	2	22	_	Low	1. All stormwater outflows must be protected with reno-mattresses and gabion baskets to reduce the effect of erosion on the access road. 2. Where possible, indigenous vegetation needs to be returned as soon as construction ceases. 3. Soil stockpiles need to be grassed with an indigenous mix and rehabilitated to prevent soil loss through wind and water erosion before operation phase begins. 4. Rehabilitation should take place as soon as construction is complete. 5. Operation phase should only begin once the ECO has deemed rehabilitation successful and mitigation measures have been implemented. 6. A six month check of the area should take place for the emergence erosion gulley's, and if gulley's emerge, will need to be rehabilitated immediately.	1	2	1	2	3	1	9	_	Low
Biodiversity loss due to operation phase	Biodiversity could be lost if rehabilitation measures are not implemented. This can be partly mitigated if rehabilitation is successful.	2	3	2	3	3	2	26	_	Medium	1. A post construction monitoring programme to ensure that rehabilitation efforts are successful and that edge effects are reduced. 2. Monthly monitoring of these sensitive areas should take place during the first year after construction to ensure that rehabilitation is successful. 3. Six monthly checks of the area should take place for the emergence of invader species.	1	2	1	2	3	2	18	_	Low
Vegetation	Establishment and spread of alien invasive plant species due disturbance vectors	1	3	2	3	3	2	24	_	Medium	1. Compile and implement Alien Invasive Management Plan. 2. Rehabilitate disturbed areas.	1	2	2	2	3	2	20	_	Low
Aquatic	Seepage from septic tanks. Movement of contaminated water from septic tanks	1	2	2	1	3	1	9	_	Low	1. This impact can only be mitigated in the construction phase through careful location and design of the toilet sites.	1	1	1	1	3	1	7	_	Low
Aquatic	Construction of new roads and upgrading of existing roads. Mobilisation of soil as a result of erosion at building sites or along road and pipeline routes	1	1	1	1	1	1	5	_	Low	1. All sites must be checked for any signs of soil erosion on at least a quarterly basis. 2. Any erosion found must be addressed immediately and be rehabilitated as is appropriate to the site. 3. Once the site has been repaired and revegetation done, an ongoing check must be undertaken for invasion by alien plant species. If any are found they are to be eradicated immediately.	1	1	1	1	1	1	5	_	Low
Decommissioning Phase																				
Loss of Agricultural Resources (Including Land Use)	The loss of current agricultural land use through altering the land use for alternative land uses.	1	1	1	1	1	1	5	_	Low	1. It is not envisioned that the project will have a decommissioning phase. 2. The rehabilitation should not be an onerous task as the footprint area is small.	1	1	1	1	1	1	5	_	Low
Loss of High Potential Soil Resources	The compaction, erosion, and contamination of high value soil resources which were not initially part of the construction impacts.	1	1	1	1	1	1	5	_	Low	1. It is not envisioned that the project will have a decommissioning phase. 2. Once surfaces have been exposed, they must immediately be protected from erosion, so limiting the source of the sediment. 3. Temporary diversion must be used to direct runoff from impervious areas to the sediment traps. 4. Sediment traps must be used in areas of concentrated runoff. 5. If soil contamination occurs (such as due to a spill) the soil must be removed from the site and disposed of appropriately.	1	1	1	1	1	1	5	_	Low

Loss of High Potential Land Capability	The loss of high potential land capability through altering the land use for alternative land uses. As well as through excavation, compaction, erosion, and contamination of soil resources.	1	1	1	1	1	1	5	_	Low	1. The high potential land which will be impacted on is small and will have a low impact as the land is not used for agriculture.	1	1	1	1	1	1	5	_	Low
Cumulative																				
Loss of Agricultural Resources (Including Land Use)	The cumulative loss of agricultural resources over the region through small or large projects impacting on the agriculture.	1	1	2	1	1	1	6	-	Low	No agricultural resources were identified within the project footprint.	1	1	2	1	1	1	6	_	Low
Loss of High Potential Soil Resources	The cumulative loss of high value soil resources over the region through small or large projects impacting on the soils.	1	1	2	2	3	1	9	-	Low	The footprint areas are small and the initial impact ratings were low. This will have a low cumulative impact.	1	1	2	2	3	1	9	_	Low
Loss of High Potential Land Capability	The cumulative loss of high potential land capability over the region through small or large projects impacting on the total land capability.	1	1	2	2	3	1	9	-	Low	The footprint areas are small and the initial impact ratings were low. This will have a low cumulative impact.	1	1	2	2	3	1	9	_	Low

17. POSITIVE AND NEGATIVE IMPACTS OF THE UKUWELA PROJECT

A summary of the impacts pre-mitigation and post-mitigation are provided below:

Table 10: Summary of impacts pre-mitigation and post-mitigation for the GUNR Office and Free Me Complex

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	PRE-MITIGATION	POST-MITIGATION
PLANNING PHASE			
Loss of Agricultural Resources (Including Land Use)	The loss of current agricultural land use through poor planning of new development footprints.	Low	Low
Loss of High Potential Soil Resources	The loss of high value soil resources through poor planning of new development footprints.	Low	Low
Loss of High Potential Land Capability	The loss of current agricultural land use through poor planning of new development footprints.	Low	Low
CONSTRUCTION PHASE			
Loss of Agricultural Resources (Including Land Use)	The loss of current agricultural land use through altering the land use for alternative land uses.	Low	Low
Loss of High Potential Soil Resources	The excavation, compaction, erosion, and contamination of high value soil resources.	Low	Low
Loss of High Potential Land Capability	The loss of high potential land capability through altering the land use for alternative land uses. As well as through excavation, compaction, erosion, and contamination of soil resources.	Low	Low
Heritage	Impact on archaeological site DH01	Low	Low
Indigenous natural vegetation	Loss, degradation or fragmentation of vegetation through direct clearing	Low	Low
Transformation of habitat for flora	Hard transformation of proposed access roads and accommodations will result in a marginal reduction in flora. The access roads being a linear activity will result in the disturbance of the soil surface, and this often leads to the establishment of alien invasive plant species.	Medium	Low
Erosion related impacts	Vegetation binds and protects the soil surface, and when removed, increases erosion potential. This may lead to water and wind removing vital topsoil and blocking up drains and eventually clogging roadsides and drainage lines.	Low	Low
Habitat transformation and fragmentation for fauna	Continued transformation of vegetation in the area will result in a marginal reduction in flora and fauna for the area. Disturbance of the soil surface and a leads to the establishment of alien invasive plant species. Continued transformation of the land results in habitat fragmentation, where edge effects decrease suitable habitat for a wide range of fauna in the area. This leads to an overall indirect decline in faunal diversity.	Low	Low
Paleontology	Uncovering of Significant Palaeontological Material	Medium	Low

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	PRE-MITIGATION	POST-MITIGATION
Aquatic	Construction of new roads and upgrading of existing roads: Mobilisation of soil which could be transported into watercourses by storm water flows	Low	Low
Aquatic	Building of proposed facilities: Building operations entail importing a wide variety of construction materials but also the generation of wastes such as paper, plastics, food containers, cement bags, rubble, scrap materials, etc.	Low	Low
Air/dust pollution	Dust could become a problem during construction, especially on windy days. Air pollution may occur in the vicinity of the site and the immediate surrounds during the construction phase as a result of: Exhaust fumes from heavy vehicles and machinery, in particular poorly serviced vehicles Dust from exposed surfaces and soil stockpiles picked up by wind Dust on haulage and access roads emitted into the air by construction vehicles Odours downstream of inappropriate and mismanaged chemical toilets	Low	Low
Socio Economic	Job creation	Low	n/a
Noise	The generation of noise (from earth moving machinery, installation of the tanks etc.) during the construction phase may result in the disturbance. Noise generated by delivery vehicles, earth moving machinery and the workforce have the potential to impact negatively on surrounding residents. The negative impacts could result in an increase in stress and frustration and associated health implications. Disturbance may also be caused by construction starting too early or finishing too late. However, these impacts are likely to be sporadic and relatively short.	Low	Low
Aquatic	Spillage of hydrocarbons such as fuels and oils. Contamination of the watercourse and wetland areas by vehicles, plant or equipment leaking fuel, oils and other substances. Hydrocarbons are toxic to aquatic fauna and may be persistent in the aquatic system.	Medium	Low
Aquatic	Leakage or spillage from toilets and ablution facilities. Toilets and ablution facilities could spill or leak human wastes into the river.	Low	Low
OPERATION PHASE			
Socio Economic	Job creation	Low	n/a
Loss of Agricultural Resources (Including Land Use)	The loss of current agricultural land use through altering the land use for alternative land uses.	Low	Low
Loss of High Potential Soil Resources	The compaction, erosion, and contamination of high value soil resources which were not initially part of the construction impacts.	Low	Low

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	PRE-MITIGATION	POST-MITIGATION
Loss of High Potential Land Capability	The loss of high potential land capability through altering the land use for alternative land uses. As well as through excavation, compaction, erosion, and contamination of soil resources.	Low	Low
Erosion related impacts for operation phase	Erosion is currently occurring on the access road. The preferred routing access road us likely to have high erosion potential should proper stormwater control measures not be in place.	Low	Low
Biodiversity loss due to operation phase	Biodiversity could be lost if rehabilitation measures are not implemented. This can be partly mitigated if rehabilitation is successful.	Medium	Low
Vegetation	Establishment and spread of alien invasive plant species due disturbance vectors	Medium	Low
Aquatic	Seepage from septic tanks. Movement of contaminated water from septic tanks	Low	Low
Aquatic	Construction of new roads and upgrading of existing roads. Mobilisation of soil as a result of erosion at building sites or along road and pipeline routes	Low	Low
DECOMISSIONING PHASE			
Loss of Agricultural Resources (Including Land Use)	The removal of infrastructure and rehabilitation to prior conditions	Low	Low
Loss of High Potential Soil Resources	The removal of infrastructure and rehabilitation to prior conditions.	Low	Low
Loss of High Potential Land Capability	The removal of infrastructure and rehabilitation to prior conditions	Low	Low
Loss of Agricultural Resources (Including Land Use)	The cumulative loss of agricultural resources over the region through small or large projects impacting on the agriculture.	Low	Low
Loss of High Potential Soil Resources	The cumulative loss of high value soil resources over the region through small or large projects impacting on the soils.	Low	Low
Loss of High Potential Land Capability	The cumulative loss of high potential land capability over the region through small or large projects impacting on the total land capability.	Low	Low

Table 11: Summary of impacts pre-mitigation and post-mitigation for the Managers House

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	PRE MITIGATION	POST MITIGATION
Loss of Agricultural Resources (Including Land Use)	The loss of current agricultural land use through poor planning of new development footprints.	Low	Low
Loss of High Potential Soil Resources	The loss of high value soil resources through poor planning of new development footprints.	Low	Low
Loss of High Potential Land Capability	The loss of current agricultural land use through poor planning of new development footprints.	Low	Low

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	PRE MITIGATION	POST MITIGATION
Loss of Agricultural Resources (Including Land Use)	The loss of current agricultural land use through altering the land use for alternative land uses.	Low	Low
Loss of High Potential Soil Resources	The excavation, compaction, erosion, and contamination of high value soil resources.	Low	Low
Loss of High Potential Land Capability	The loss of high potential land capability through altering the land use for alternative land uses. As well as through excavation, compaction, erosion, and contamination of soil resources.	Low	Low
Heritage	Impact on archaeological site DH01	Low	Low
Indigenous natural vegetation	Loss, degradation or fragmentation of vegetation through direct clearing	Low	Low
Transformation of habitat for flora	Hard transformation of proposed access roads and accommodations will result in a marginal reduction in flora. The access roads being a linear activity will result in the disturbance of the soil surface, and this often leads to the establishment of alien invasive plant species.	Medium	Low
Erosion related impacts	Vegetation binds and protects the soil surface, and when removed, increases erosion potential. This may lead to water and wind removing vital topsoil and blocking up drains and eventually clogging roadsides and drainage lines.	Low	Low
Habitat transformation and fragmentation for fauna	Continued transformation of vegetation in the area will result in a marginal reduction in flora and fauna for the area. Disturbance of the soil surface and a leads to the establishment of alien invasive plant species. Continued transformation of the land results in habitat fragmentation, where edge effects decrease suitable habitat for a wide range of fauna in the area. This leads to an overall indirect decline in faunal diversity.	Low	Low
Paleontology	Uncovering of Significant Palaeontological Material	Medium	Low
Aquatic	Construction of new roads and upgrading of existing roads: Mobilisation of soil which could be transported into watercourses by storm water flows	Low	Low
Aquatic	Building of proposed facilities: Building operations entail importing a wide variety of construction materials but also the generation of wastes such as paper, plastics, food containers, cement bags, rubble, scrap materials, etc.	Low	Low
Aquatic	Leakage or spillage from toilets and ablution facilities. Toilets and ablution facilities could spill or leak human wastes into the river	Low	Low

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	PRE MITIGATION	POST MITIGATION
Aquatic	Spillage of hydrocarbons such as fuels and oils. Contamination of the watercourse and wetland areas by vehicles, plant or equipment leaking fuel, oils and other substances. Hydrocarbons are toxic to aquatic fauna and may be persistent in the aquatic system.	Medium	Low
Air/dust pollution	Dust could become a problem during construction, especially on windy days. Air pollution may occur in the vicinity of the site and the immediate surrounds during the construction phase as a result of: Exhaust fumes from heavy vehicles and machinery, in particular poorly serviced vehicles Dust from exposed surfaces and soil stockpiles picked up by wind Dust on haulage and access roads emitted into the air by construction vehicles Odours downstream of inappropriate and mismanaged chemical toilets	Low	Low
Socio Economic	Job creation	Low	n/a
Noise	The generation of noise (from earth moving machinery, installation of the tanks etc.) during the construction phase may result in the disturbance. Noise generated by delivery vehicles, earth moving machinery and the workforce have the potential to impact negatively on surrounding residents. The negative impacts could result in an increase in stress and frustration and associated health implications. Disturbance may also be caused by construction starting too early or finishing too late. However, these impacts are likely to be sporadic and relatively short.	Low	Low
Socio Economic	Job creation	Low	n/a
Loss of Agricultural Resources (Including Land Use)	The loss of current agricultural land use through altering the land use for alternative land uses.	Low	Low
Loss of High Potential Soil Resources	The compaction, erosion, and contamination of high value soil resources which were not initially part of the construction impacts.	Low	Low
Loss of High Potential Land Capability	The loss of high potential land capability through altering the land use for alternative land uses. As well as through excavation, compaction, erosion, and contamination of soil resources.	Low	Low
Erosion related impacts for operation phase	Erosion is currently occurring on the access road. The preferred routing access road us likely to have high erosion potential should proper stormwater control measures not be in place.	Low	Low
Biodiversity loss due to operation phase	Biodiversity could be lost if rehabilitation measures are not implemented. This can be partly mitigated if rehabilitation is successful.	Medium	Low

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	PRE MITIGATION	POST MITIGATION
Vegetation	Establishment and spread of alien invasive plant species due to disturbance vectors	Medium	Low
Aquatic	Seepage from septic tanks. Movement of contaminated water from septic tanks	Low	Low
Aquatic	Construction of new roads and upgrading of existing roads. Mobilisation of soil as a result of erosion at building sites or along road and pipeline routes	Low	Low
Loss of Agricultural Resources (Including Land Use)	The loss of current agricultural land use through altering the land use for alternative land uses.	Low	Low
Loss of High Potential Soil Resources	The compaction, erosion, and contamination of high value soil resources which were not initially part of the construction impacts.	Low	Low
Loss of High Potential Land Capability	The loss of high potential land capability through altering the land use for alternative land uses. As well as through excavation, compaction, erosion, and contamination of soil resources.	Low	Low
Loss of Agricultural Resources (Including Land Use)	The cumulative loss of agricultural resources over the region through small or large projects impacting on the agriculture.	Low	Low
Loss of High Potential Soil Resources	The cumulative loss of high value soil resources over the region through small or large projects impacting on the soils.	Low	Low
Loss of High Potential Land Capability	The cumulative loss of high potential land capability over the region through small or large projects impacting on the total land capability.	Low	Low

Table 12: Summary of impacts pre-mitigation and post-mitigation for the Tented Camp

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	PRE MITIGATION	POST MITIGATION
PLANNING PHASE: NONE			
CONSTRUCTION PHASE			
Indigenous natural vegetation	Loss, degradation or fragmentation of vegetation through direct clearing	Low	Low
Transformation of habitat for flora	Hard transformation of proposed access roads and accommodations will result in a marginal reduction in flora. The access roads being a linear activity will result in the disturbance of the soil surface, and this often leads to the establishment of alien invasive plant species.	Medium	Low
Erosion related impacts	Vegetation binds and protects the soil surface, and when removed, increases erosion potential. This may lead to water and wind removing vital topsoil and blocking up drains and eventually clogging roadsides and drainage lines.	Low	Low

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	PRE MITIGATION	POST MITIGATION
Habitat transformation and fragmentation for fauna	Continued transformation of vegetation in the area will result in a marginal reduction in flora and fauna for the area. Disturbance of the soil surface and a leads to the establishment of alien invasive plant species. Continued transformation of the land results in habitat fragmentation, where edge effects decrease suitable habitat for a wide range of fauna in the area. This leads to an overall indirect decline in faunal diversity.	Low	Low
Heritage	Impact on archaeological site DH01	Low	Low
Paleontology	Uncovering of Significant Palaeontological Material	Medium	Low
Aquatic	Construction of new roads and upgrading of existing roads: Mobilisation of soil which could be transported into watercourses by storm water flows	Low	Low
Aquatic	Building of proposed facilities: Building operations entail importing a wide variety of construction materials but also the generation of wastes such as paper, plastics, food containers, cement bags, rubble, scrap materials, etc.	Low	Low
Aquatic	Spillage of hydrocarbons such as fuels and oils. Contamination of the watercourse and wetland areas by vehicles, plant or equipment leaking fuel, oils and other substances. Hydrocarbons are toxic to aquatic fauna and may be persistent in the aquatic system.	Medium	Low
Aquatic	Leakage or spillage from toilets and ablution facilities. Toilets and ablution facilities could spill or leak human wastes into the river	Low	Low
Socio Economic	Dust could become a problem during construction, especially on windy days. Air pollution may occur in the vicinity of the site and the immediate surrounds during the construction phase as a result of: Exhaust fumes from heavy vehicles and machinery, in particular poorly serviced vehicles Dust from exposed surfaces and soil stockpiles picked up by wind Dust on haulage and access roads emitted into the air by construction vehicles Odours downstream of inappropriate and mismanaged chemical toilets	Low	Low
OPERATION PHASE			
Socio Economic	Job creation	Low	n/a

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	PRE MITIGATION	POST MITIGATION
Socio Economic: Noise	The generation of noise (from earth moving machinery, installation of the tanks etc.) during the construction phase may result in the disturbance. Noise generated by delivery vehicles, earth moving machinery and the workforce have the potential to impact negatively on surrounding residents. The negative impacts could result in an increase in stress and frustration and associated health implications. Disturbance may also be caused by construction starting too early or finishing too late. However, these impacts are likely to be sporadic and relatively short.	Low	Low
Socio Economic	Job creation	Low	n/a
Erosion related impacts for operation phase	Erosion is currently occurring on the access road. The preferred routing access road us likely to have high erosion potential should proper stormwater control measures not be in place.	Low	Low
Biodiversity loss due to operation phase	Biodiversity could be lost if rehabilitation measures are not implemented. This can be partly mitigated if rehabilitation is successful.	Medium	Low
Vegetation	Establishment and spread of alien invasive plant species due disturbance vectors	Medium	Low
Aquatic	Seepage from septic tanks. Movement of contaminated water from septic tanks	Medium	Low
Aquatic	Construction of new roads and upgrading of existing roads. Mobilisation of soil as a result of erosion at building sites or along road and pipeline routes.	Low	Low
DECOMISSIONING PHASE			
Wetland/ Aquatic	When the facility is eventually upgraded or decommissioned the same objective of protecting the river and the wetlands remains and so the management and mitigation measures listed above should be referred to as guidelines.		

Table 13: Summary of impacts pre-mitigation and post-mitigation for the Ukuwela Donor House

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	PRE MITIGATION	POST MITIGATION
PLANNING PHASE			
Loss of Agricultural Resources (Including Land Use)	The loss of current agricultural land use through poor planning of new development footprints.	Low	Low
Loss of High Potential Soil Resources	The loss of high value soil resources through poor planning of new development footprints.	Low	Low

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	PRE MITIGATION	POST MITIGATION
Loss of High Potential Land Capability	The loss of current agricultural land use through poor planning of new development footprints.	Low	Low
CONSTRUCTION PHASE			
Loss of Agricultural Resources (Including Land Use)	The loss of current agricultural land use through altering the land use for alternative land uses.	Low	Low
Loss of High Potential Soil Resources	The excavation, compaction, erosion, and contamination of high value soil resources.	Low	Low
Loss of High Potential Land Capability	The loss of high potential land capability through altering the land use for alternative land uses. As well as through excavation, compaction, erosion, and contamination of soil resources.	Low	Low
Heritage	Impact on archaeological site DH01	Low	Low
Indigenous natural vegetation	Loss, degradation or fragmentation of vegetation through direct clearing	Low	Low
Transformation of habitat for flora	Hard transformation of proposed access roads and accommodations will result in a marginal reduction in flora. The access roads being a linear activity will result in the disturbance of the soil surface, and this often leads to the establishment of alien invasive plant species.	Medium	Low
Erosion related impacts	Vegetation binds and protects the soil surface, and when removed, increases erosion potential. This may lead to water and wind removing vital topsoil and blocking up drains and eventually clogging roadsides and drainage lines.	Low	Low
Habitat transformation and fragmentation for fauna	Continued transformation of vegetation in the area will result in a marginal reduction in flora and fauna for the area. Disturbance of the soil surface and a leads to the establishment of alien invasive plant species. Continued transformation of the land results in habitat fragmentation, where edge effects decrease suitable habitat for a wide range of fauna in the area. This leads to an overall indirect decline in faunal diversity.	Low	Low
Paleontology	Uncovering of Significant Palaeontological Material	Medium	Low
Aquatic	Construction of new roads and upgrading of existing roads: Mobilisation of soil which could be transported into watercourses by storm water flows	Low	Low
Aquatic	Building of proposed facilities: Building operations entail importing a wide variety of construction materials but also the generation of wastes such as paper, plastics, food	Low	Low

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	PRE MITIGATION	POST MITIGATION
	containers, cement bags, rubble, scrap materials, etc.		
Aquatic	Leakage or spillage from toilets and ablution facilities. Toilets and ablution facilities could spill or leak human wastes into the river	Low	Low
Aquatic	Spillage of hydrocarbons such as fuels and oils. Contamination of the watercourse and wetland areas by vehicles, plant or equipment leaking fuel, oils and other substances. Hydrocarbons are toxic to aquatic fauna and may be persistent in the aquatic system.	Medium	Low
Socio Economic	Air/dust pollution	Low	Low
Socio Economic	Job creation	Low	n/a
Socio Economic: Noise	The generation of noise (from earth moving machinery, installation of the tanks etc.) during the construction phase may result in the disturbance. Noise generated by delivery vehicles, earth moving machinery and the workforce have the potential to impact negatively on surrounding residents. The negative impacts could result in an increase in stress and frustration and associated health implications. Disturbance may also be caused by construction starting too early or finishing too late. However, these impacts are likely to be sporadic and relatively short.	Low	Low
OPERATION PHASE			
Socio Economic	Job creation	Low	n/a
Loss of Agricultural Resources (Including Land Use)	The loss of current agricultural land use through altering the land use for alternative land uses.	Low	Low
Loss of High Potential Soil Resources	The compaction, erosion, and contamination of high value soil resources which were not initially part of the construction impacts.	Low	Low
Loss of High Potential Land Capability	The loss of high potential land capability through altering the land use for alternative land uses. As well as through excavation, compaction, erosion, and contamination of soil resources.	Low	Low
Erosion related impacts for operation phase	Erosion is currently occurring on the access road. The preferred routing access road us likely to have high erosion potential should proper stormwater control measures not be in place.	Low	Low
Biodiversity loss due to operation phase	Biodiversity could be lost if rehabilitation measures are not implemented. This can be partly mitigated if rehabilitation is successful.	Medium	Low

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	PRE MITIGATION	POST MITIGATION
Vegetation	Establishment and spread of alien invasive plant species due disturbance vectors	Medium	Low
Aquatic	Seepage from septic tanks. Movement of contaminated water from septic tanks	Low	Low
Aquatic	Construction of new roads and upgrading of existing roads. Mobilisation of soil as a result of erosion at building sites or along road and pipeline routes	Low	Low
DECOMISSIONING PHASE			
Loss of Agricultural Resources (Including Land Use)	The loss of current agricultural land use through altering the land use for alternative land uses.	Low	Low
Loss of High Potential Soil Resources	The compaction, erosion, and contamination of high value soil resources which were not initially part of the construction impacts.	Low	Low
Loss of High Potential Land Capability	The loss of high potential land capability through altering the land use for alternative land uses. As well as through excavation, compaction, erosion, and contamination of soil resources.	Low	Low
CUMULATIVE			
Loss of Agricultural Resources (Including Land Use)	The cumulative loss of agricultural resources over the region through small or large projects impacting on the agriculture.	Low	Low
Loss of High Potential Soil Resources	The cumulative loss of high value soil resources over the region through small or large projects impacting on the soils.	Low	Low
Loss of High Potential Land Capability	The cumulative loss of high potential land capability over the region through small or large projects impacting on the total land capability.	Low	Low

17.1 Mitigation measures

Refer to **section 16** above. The assessment of each issue is included in **Section 16** above and mitigation measures are provided for each impact identified.

18. SUMMARY OF SPECIALIST FINDINGS AND RECOMMENDATIONS

Table 14: Summary of specialist findings and recommendations

Specialist Study	Findings	Recommendations
Soils, Land Capability and Land use Specialist Assessment	The sensitivity analysis identified the project area to have a Medium to High sensitivity and as such an Agro-Ecosystem Assessment was required. The results show that none of the development sites are within any crop boundaries. The remaining area ranges from Medium to High sensitivity. The Managers house and the Free Me site are within a High sensitivity area. The Donor house and the Tented camp site are within a Medium sensitivity area. The High sensitivity ratings of the managers house and the Free Me sites were verified as High. The Medium sensitivity areas (Tented camp and Donor house) have been verified as medium, based on the slope of these sites. The sandy nature of the soil at the tented camp is also a limiting factor. The impact assessment has determined that the activities are rated as a Low impact on agricultural resources. This is largely due to the following aspects; • The sites are not located on any existing or previously utilised agricultural land; • The sites are not fragmenting agricultural resources; • The development will be sparsely utilised as and secondary impacts are unlikely; • The size of the development sites are small in nature and do not pose a significant impact on the overall agricultural importance of the region; and • The sites are located within a protected nature reserve and it is not proposed to change the current land use to agriculture.	The following recommendations are made; • Green engineering methods be implemented to retain some soil structure in the development area; and • The proposed mitigation measures are to be followed to prevent unnecessary loss to soil resources.
Hydropedological Impact Assessment	The Ukuwela development will have a Low impact on the flow drivers and wetlands within the project area. The impacts to the flow drivers include the increased runoff from the development upslope within the recharge zone and interflow zones. These stem from the increased impervious surfaces which promote runoff from the impervious surfaces.	The following recommendations have been made to minimise threats to sensitive receptors (sub-surface flow paths) and wetland functioning;

Specialist Study	Findings	Recommendations
	It is the opinion of the Specialist that the proposed development may proceed, this is based on the proposed recommendations.	• Green engineering structures should be considered to improve infiltration into the vadose zones; • It is recommended that an alien invasive management programme is implemented; and • Buffer zones are to be kept intact.
Heritage Impact Assessment	A HIA was undertaken for the proposed four developments at Greater Ukuwela Nature Reserve. There will be four built structures with access tracks located at different parts on the Nature Reserve. Two of the structures have no heritage sites. The tented camp has isolated artefacts that originate further up the hill. The Donor House has artefacts in a secondary context, while part of the track passes areas of high artefact concentration. It is not necessary to divert the track at this stage, however monitoring of the area is recommended during site clearing. The proposed developments at Ukuwela will only affect part of one archaeological site. DH01. The impact will be low and only affect the upper 10cm of topsoil. A desktop PIA was undertaken and found that the palaeontology of the area is of high significance. The desktop study suggested that fieldwork would be required to fully assess the proposed developments on the fossil record prior to construction. A Paleontological Chance Finds Protocol has therefore been included in the EMPr too.	The area will need to be monitored by a suitably qualified archaeologist after vegetation clearance and during any topsoil removal. A collection permit should be obtained so that any significant artefacts can be sampled. If needs be, the track can be altered if any features are noted. A PIA field survey will be required to determine the full extent of the fossil record.
Aquatic Impact Assessment	The watercourses and wetlands within the Greater Ukuwela Nature Reserve have been visited and assessed in relation to the proposed development of four sites within the reserve. The construction phase will have very low potential for any impacts on the watercourses or wetlands and they will be short term impacts largely restricted to that phase. Careful management of the construction sites and process will reduce these impacts further. In the operational phase the impacts arising from the operation and maintenance of the facilities will obviously persist through a longer time. Impacts from routine road and site maintenance are very limited and can easily	It is the opinion of the specialist that the construction of the new facilities will have no fatal flaws but will contribute to sustainable job creation and biodiversity conservation in the region, and may therefore be authorised but only subject to certain conditions. These conditions are as follows: • The mitigatory measures put forward must be adhered to.

Specialist Study	Findings	Recommendations
	be reduced through monitoring of the areas and then addressing any problems as they arise. Seepage from the tented camp septic tanks is a longer term issue but it too can be reduced through proper design and construction. Against these impacts are the major positive impacts of provision of new jobs and of the sustainable development of a new conservation area in a part of the province of KwaZulu-Natal which has very high biodiversity values and which is in direct linkage with the Isimangaliso Wetland Park which is both a world heritage site and a Ramsar site. The Mzinene River which flows along the reserve boundary will in effect become an extension of the larger park area and so contribute to the well-being of that area. In addition, since the northern bank of the river is also in a private conservation area, the protection of the south bank will give the lower reaches of the river enhanced conservation value.	• The appointed ECO must have authority to motivate for further measures if unforeseen impacts arise. • The proposed monitoring measures must be put in place and be rigorously implemented
Ecological Impact Assessment	From a faunal perspective, the study area has a medium to high conservation value. This is based on the potential for this site to harbour some species of conservation importance, which are present on site and within the surrounding reserves, which may use GUNR as a viable home range or as transient species utilising an ecological corridor. Habitat for foraging is abundant throughout the whole reserve, and so faunal species can move to adjacent areas during construction. This is unlikely to affect the status of species of conservation concern. It is not anticipated that the proposed construction will have a long term negative effect on the fauna of the area. The fauna of the site is directly dependent on the vegetation of the site, and the careful management of the vegetation (and soil) will benefit the fauna of the area It is important to mention that additional species may have been overlooked during the field survey because of the plant life history characteristics exhibited by certain plant species during this time of the season. Some species, especially the plants which have underground bulbs, may not have emerged due variations in their life strategies. However, it is the Specialist's opinion that the vegetation that was recorded from the site assessment provides enough information in order for inferences and extrapolations as to the quality, and the likely impacts associated with a development of this nature, to be made. When development does take place and indigenous plants will need to be removed or relocated, permits for their removal will need to be obtained from	Should any development take place the following is recommended but not limited to: ✓ Permits for the removal and relocation of plants (DAFF for *Sclerocarya birrea* and EKZNW for *Asparagus spp.*) must be in place before any construction can commence; ✓ Translocation plan should inform the relocation of indigenous plants; including storing protected plants within an onsite plant storage area or for rehabilitation purposes. To be decided upon by the DAFF / EKZNW permit requirements. ✓ The appointed ECO should do a site walk through prior to construction commencing to search for breeding and nesting fauna. Should these be identified, a search and rescue operation by a suitably qualified person, must be

Specialist Study	Findings	Recommendations
	DAFF and Ezemvelo KZN Wildlife. The removal should occur during their dormant growth period months and with due care informed by a Translocation Plan, preferably complied by a qualified botanist or similarly qualified individual. The plants should be relocated into areas with the same aspect, soil conditions and elevation to ensure that the relocations are successful. In addition, the plants should be placed into good-sized holes that are at least twice the size of underground organs. It is very important for survival for underground organs not to be damaged and for plants to be watered for a period of time. Bulbs, however, are able to withstand a relatively high level of disturbance, given their survival strategy of storing the required reserve resources in the bulb. These species will likely re- generate following their excavation and replacement. Any applicable approvals/permits/consents/licenses relating to the environment should be in place prior to any site clearing and development. Good housekeeping and management of the construction impacts will see no or very limited impact on the environment. The overall area is transformed but is recovering from many years of farming activities and therefore currently has a medium conservation value. Although species identified in the DFFE Screening Tool may be present on site (including species as per the POC table), the type of construction limits the overall loss in habitat for these species, especially if mitigation measures are implemented. Further to this, species identified in the TSCP Minset dataset mirror that of the DFFE Screening Tool. Ecological corridors, CBA: Irreplaceable areas and threatened ecosystems will ultimately benefit from the increase in revenue generated from the four facilities proposed for GUNR. Even though there may be site specific impacts, these can largely be mitigated against and the overall objective of conserving the fauna, flora and ecosystems is achieved. The ecologist has no objection to the development provided all mitigation measures can be agreed and achieved are implemented.	undertaken before construction commences; ✓ Rehabilitation must occur once construction is complete in the relevant area; ✓ Community outreach regarding poaching of fauna should be undertaken; ✓ Rehabilitation of vegetation communities would improve faunal diversity across the site; ✓ An Alien Invasive Control Programme must be implemented. ✓ Erosion control measures must be implemented; ✓ Construction must occur in a phased approach and ✓ Care must be taken that veld fires are not started. ✓ No biodiversity offset plan is recommended.

19. ENVIRONMENTAL IMPACT STATEMENT

The Greater Ukuwela Nature Reserve Development has been proposed by Wild Tomorrow Fund in order to further promote conservation and efficient management of their reserve.

Wild Tomorrow Fund believes the Donor House will be an excellent opportunity to deepen relationships with existing and potential donors that will ultimately lead to more funding for conservation. The donor house will be an important source of sustainable revenue for the reserve, bringing both invited and paying guests while creating additional employment to the area.

The proposed sites that have been selected for the proposed facilities have been designed to avoid sensitive features on site as far as possible and have been further refined through the various specialist studies that have been undertaken.

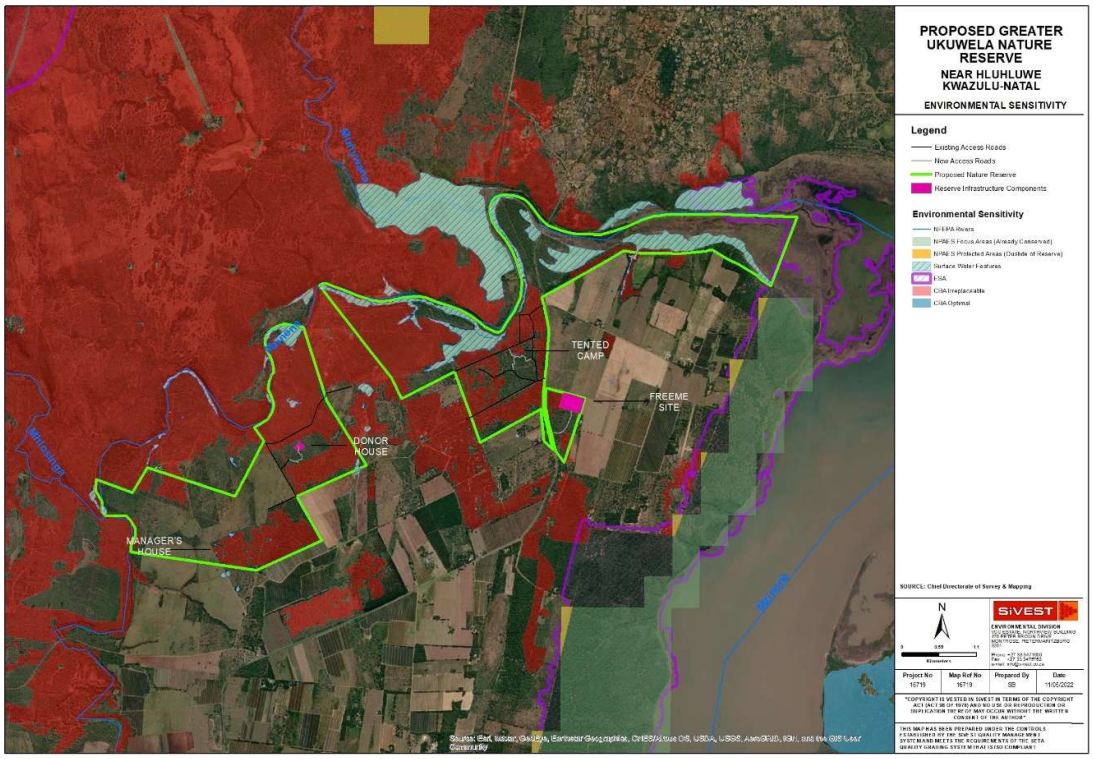

Figure 12: Environmental Sensitivity overlay with proposed infrastructure

The following specialist studies have been undertaken for the project:

- Wetland Aquatic Assessment;
- Ecological Assessment;
- Heritage Assessment;
- Soils and Land Capability Assessment; and
- Hydropedological Assessment.

The specialist assessments were conducted to address the potential impacts relating to the proposed development in order to ascertain the level of each identified impact, as well as mitigation measures which may be required.

Specialist reports have been included in Appendix F and the main findings of the specialist studies are included in **Section 18** above.

The proposed Project will have low negative impacts from a biophysical perspective as a result of the already transformed nature of the site and the layout being designed to avoid sensitive features. The negative impacts that are likely to arise from the construction phase will be of lower significance if the recommended mitigation measures are implemented. Should the project not go ahead, there will be no further opportunity for promoting conservation.

The specialist assessments concluded the following:

The **Agricultural specialist** indicated that It is the opinion of the Agricultural Specialist that the proposed development may proceed, this is based on the following recommendations:

- Green engineering methods be implemented to retain some soil structure in the development area; and
- The mitigation measures are to be followed to prevent unnecessary loss to soil resources.

The **Aquatic specialist** concluded that the proposed developments within the GUNR have been investigated and assessed sufficiently and thoroughly to allow for a decision to be made in regard to the further progression of the project. The construction phase will very low potential for any impacts on the watercourses or wetlands and they will be short term impacts largely restricted to that phase. All can be reduced even further by careful management of the construction sites and process. In the operational phase the impacts arising from the operation and maintenance of the facilities will obviously persist through a longer time. Impacts from routine road and site maintenance are very limited and can easily be reduced through monitoring of the areas and then addressing any problems as they arise. Seepage from the tented camp septic tanks is a longer term issue but it too can be reduced through proper design and construction. Against these impacts are the major positive impacts of provision of new jobs and of the sustainable development of a new conservation area in a part of the province of KwaZulu-Natal which has very high biodiversity values and which is in direct linkage with the Isimangaliso Wetland Park which is both a world heritage site and a Ramsar site.

The **Hydropedology specialist** indicated that The Ukuwela development will have a Low impact on the flow drivers and wetlands within the project area post-mitigation. The impacts to the flow drivers include the increased runoff from the development upslope within the recharge zone and interflow zones. These stem from the increased impervious surfaces which promote runoff from the impervious surfaces. It is the opinion of the Specialist that the proposed development may proceed, this is based on the above recommendations.

The **Heritage specialist** has concluded that the proposed developments at Ukuwela will only affect part of one archaeological site. DH01. The impact will be low and only affect the upper 10cm of topsoil. They suggest that the area is monitored by a suitably qualified archaeologist after vegetation clearance and during any topsoil removal. A collection permit should be

obtained so that any significant artefacts can be sampled. If needs be, the track can be altered if any features are noted. A PIA field survey will be required to determine the full extent of the fossil record.

An **Ecological specialist** indicated that the proposed development will result in a minor loss of biodiversity at a site level. However this loss can be largely mitigated against, provided the mitigation measures are implemented. Erosion potential is low due to slight slopes associated with the surrounding area. The largest threat to the site is the establishment of alien and invasive vegetation which is prevalent in the drainage lines and recovering farmlands in the area. Careful monitoring for alien and invasive species is required throughout the construction and operation phase. All of the proposed lodges / accommodation facilities and associated infrastructure are supported by the Ecologist. Overall loss of biodiversity, establishment of alien and invasive vegetation and erosion potential can be mitigated against to result in a low overall impact. No fatal flaws have been identified and the Ecologist supports the proposed development provided the mitigation measures are implemented.

A summary of the positive and negative impacts associated with the proposed project is included in **Section 17** above.

The results of the specialist assessments have indicated that the preferred alternative contains no fatal flaws that should prevent the proposed project from proceeding. Whilst it is acknowledged that the project will result in negative impacts, these can be mitigated to acceptable levels; In light of this, it is the EAP's reasoned opinion that authorisation be granted, and that the layout being proposed as part of this BA process also be authorised (provided there are no concerns raised during the public participation process).

It is trusted that the DBAR provides adequate information to the I&APs / stakeholders to provide input and for the competent authority to make an informed decision regarding the proposed development.

It should be noted that this section is deemed to be in line with the requirements of Appendix 1 of the EIA Regulations 2014, as amended, and contains a summary of the key findings of the environmental impact assessment, a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers (**Figure 12** above) and a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives.

20. ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR) AND CONDITIONS TO BE INCLUDED IN THE EA

In accordance with Appendix 4 of the EIA Regulations, 2014 (as amended), a draft EMPr has been included within the DBAR. The draft EMPr includes the impact management measures formulated by the various specialists and the recording of the proposed impact management outcomes for the development have also been included in the draft EMPr (**Appendix H**).

The draft EMPr provides suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and

monitored. The relevant management plans have also been incorporated into the draft EMPr (where required), which will assist in this regard.

Taking into account the potential negative and significant positive impacts that the proposed development could have on the biophysical and social environment, it is the opinion of the EAP that the proposed development should be authorised subject to the following conditions of authorisation:

- All of the mitigation measures identified in this BA Report must be included in the EMPr.
- It is important that all of the listed mitigation measures are costed for in the construction phase, financial planning and budget so that the contractor and/or developer cannot give financial budget constraints as reasons for non-compliance.
- All feasible and practical mitigation measures recommended by the various specialists must be incorporated into the Final Environmental Management Programme (EMPr) and implemented, where applicable;
- Where applicable, monitoring should be undertaken to evaluate the success of the mitigation measures recommended by the various specialists;
- The activity-specific construction EMPr must be adhered to; and
- An independent Environmental Control Officer (ECO) must be appointed by the applicant to monitor the implementation of the construction EMP. The ECO should undertake regular site inspections and compile an environmental audit report.

The mitigation measures based on the impacts identified have been included in **Section 16 and 17.1** above.

21. FINAL PROPOSED ALTERNATIVE WHICH RESPOND TO THE IMPACT MANAGEMENT MEASURES, AVOIDANCE, AND MITIGATION MEASURES IDENTIFIED THROUGH THE ASSESSMENT

The final proposed alternative is the preferred alternative that has been assessed as part of this BA Report (Final Layouts included in **Appendix D**).

22. ASPECTS WHICH WERE CONDITIONAL TO THE FINDINGS OF THE ASSESSMENT EITHER BY THE EAP OR SPECIALIST WHICH ARE TO BE INCLUDED AS CONDITIONS OF AUTHORISATION

None.

23. UNCERTAINTIES, ASSUMPTIONS AND GAPS IN KNOWLEDGE

The assessment has been based by SiVEST on information sourced and provided by the Applicant, site visits conducted, specialist findings and the application of the SiVEST assessment criteria. The EAP is of the opinion that the assessment method applied is acceptable. SiVEST assumes that:

- All the information provided by the Applicant is accurate and unbiased.

- The available data, including Topocadastral maps, Orthophotographs, geological maps and Google Earth images, are reasonably accurate.
- It is not always possible to involve all Interested and/or Affected Parties (I&APs) individually, however, every effort has/will be made to involve as many interested parties as possible. It is also assumed that individuals representing various associations or parties convey the necessary information to these associations / parties.
- It is not possible to determine the actual degree of the impact that the development will have on the immediate environment without some level of uncertainties. Actual impacts can only be determined following construction and/or when operation commences.

24. AUTHORISATION OF THE PROPOSED UKUWELA NATURE RESERVE DEVELOPMENT

We request that the Department authorizes the development. Wild Tomorrow Fund believes the Donor House will be an excellent opportunity to deepen relationships with existing and potential donors that will ultimately lead to more funding for conservation. The donor house will be an important source of sustainable revenue for the reserve, bringing both invited and paying guests while creating additional employment to the area. Furthermore, the layouts have been designed to avoid sensitive features on site that have been identified through the various specialist studies that have been undertaken. Whilst it is acknowledged that the project will result in negative impacts, these can be mitigated to acceptable levels; furthermore, the proposed site areas have been transformed by human activities in the past (farming etc.) and the proposed development will aid in ongoing conservation initiatives in the area.

Conditions to be included in the Environmental Authorisation for the construction phase are listed in **Section 19 and 20** above.

The environmental authorization should be valid for a period of 5 to 10 years. It is anticipated that the construction period will however commence shortly after authorization.

25. EAP DECLARATION

The EAP declarations, CV's and qualifications for the EAP's responsible for the preparation of this report have been attached in **Appendix A**.

26. INFORMATION REQUIRED BY CA (IF REQUIRED)

Currently n/a.

27. CONCLUSION

This Basic Assessment Report has covered activities and findings related to the BA process for the proposed Ukuwela Nature Reserve Development. Professional experience, specialist knowledge, relevant literature and local knowledge of the area have all been used to identify the potential issues associated with the proposed project.

There is no guarantee that all the potential impacts arising from the proposed project have been identified within the Basic Assessment phase, however the report provides an outline of the established measures that were taken to best identify all the potential impacts.

28. WAY FORWARD

The Draft Basic Assessment Report is currently being circulated for public participation for a period of 30 days (excluding public holidays) from **12 May 2022 to 13 June 2022.**

All comments received will be responded to in a Comments and Response Report (C&RR), which will be included prior to submission of the Final Basic Assessment Report (FBAR) to the decision-making authority, namely the EDTEA. Comments received on the report will be taken into consideration, incorporated into the report (where applicable) and will be used when compiling the FBAR.

Once the FBAR has been submitted and the EDTEA have acknowledged receipt thereof, a decision to either grant or refuse the EA for the proposed development will be made by the EDTEA. In addition, once a decision regarding the EA has been received from the EDTEA, all registered I&APs, stakeholders and OoS / authorities will be notified accordingly and provided details regarding the appeal process. The BA process will thus come to an end once appeals (if any) have been dealt with adequately and the appeal process closes.

All I&APs and key stakeholders are invited to register as I&APs in order to be kept informed throughout the process. To register as an I&AP / stakeholder and/or to obtain additional information, please submit your name, contact details (telephone number, postal address and email address) and the interest which you have in the application to SiVEST Environmental Division, as per the details below:

Contact: Hlengiwe Ntuli
PO Box 2921, RIVONIA, 2128
☎ Phone: (011) 798 0600
E-mail: sivest_ppp@sivest.co.za
Fax: (011) 803 7272
Website: www.sivest.com

Please reference '*Ukuwela DBAR and WULA*' in your correspondence. SiVEST shall keep all registered I&APs / key stakeholders informed of the BA process.

29. REFERENCES

Hilcove, P., McCann K., and Wright, C. (2021) Greater Ukuwela Nature Reserve Management Plan. Version 1.0.

UMkhanyakude District Municipality Integrated Development Plan 2018/2019

SiVEST Environmental Division
4 Pencarrow Crescent,
La Lucia Ridge Office Estate,
Umhlanga Rocks, 4320
PO Box 1899, Umhlanga Rocks, 4320
KwaZulu-Natal, South Africa

Tel +27 31 581 1576
Email info@sivest.co.za
www.sivest.co.za

Contact Person: Katherine Wiles
Email: katherinew@sivest.co.za