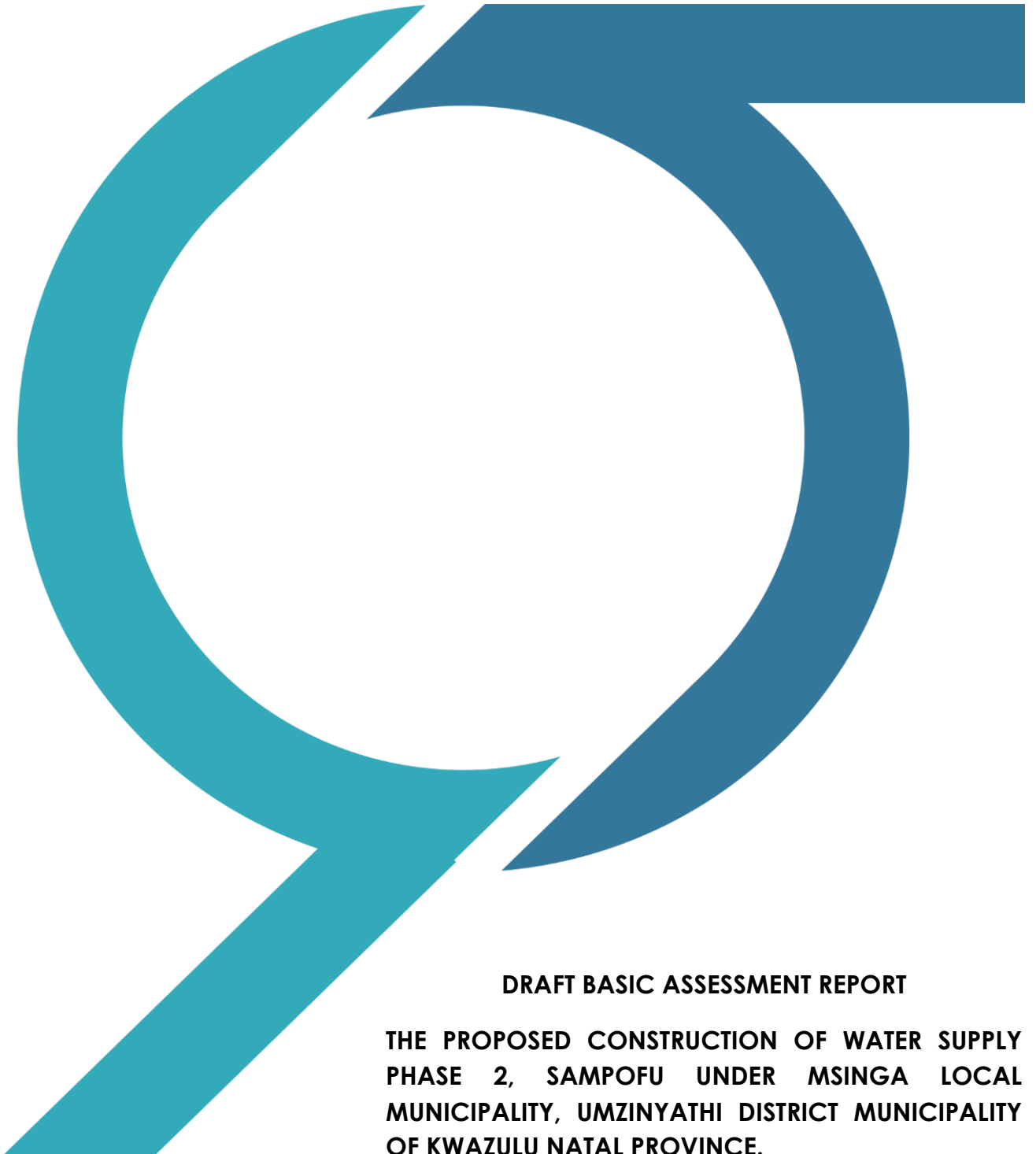


DRAFT BASIC ASSESSMENT REPORT



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**THE PROPOSED CONSTRUCTION OF WATER SUPPLY
PHASE 2, SAMPOFU UNDER MSINGA LOCAL
MUNICIPALITY, UMZINYATHI DISTRICT MUNICIPALITY
OF KWAZULU NATAL PROVINCE.**



DRAFT BASIC ASSESSMENT REPORT

THE PROPOSED CONSTRUCTION OF WATER SUPPLY PHASE 2 SAMPOFU UNDER MSINGA LOCAL MUNICIPALITY, UMZINYATHI DISTRICT MUNICIPALITY OF KWAZULU NATAL PROVINCE.

REPORT REFERENCE: IND/EMEIA-0423/01

REF NO: DC24/003/2023

NEAS: KZN/EIA/0001961/2023

<p>Prepared for:</p> <p>uMzinyathi District Municipality</p>  <p>P.O Box 1965 DUNDEE 3000</p> <p>Tel: (034) 219 1500 Fax: (034) 218 1940</p>	<p>Prepared by:</p> <p>Indaloenhle Environmental Consultants (Pty) Ltd</p>  <p>62 Old Main Road Kloof, 3610 013 003 4241 info@indaloenhle.co.za www.indaloenhle.co.za</p>
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03 AUGUST 2023

Client:

uMzinyathi District Municipality

Reference Document as:

The proposed construction of Water Supply Phase 2, Sampofu under Msinga Local Municipality, uMzinyathi District Municipality of KwaZulu Natal Province.

Report Reference: IND/EMEIA-0423/01

Ref No: DC24/003/2023

NEAS: KZN/EIA/0001961/2023

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Date of Report:

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NOTICE

The Basic Assessment Report [BAR] sets out environmental outcomes, impacts and residual risks of the proposed activity and is a public document that is made available to the Competent Authority [CA], commenting authorities, stakeholders, Interested and Affected Parties [I&APs] and the public. The BAR is available for public review and commenting period lasting thirty (30) days from the day of accessibility and it can be obtainable from Indaloenhle Environmental Consultants company website. The finalised BAR will be submitted to the KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs [KZN EDTEA] for decision-making.

Copies of this BAR are available on the company website (www.indaloenhle.co.za) and upon request from Indaloenhle Environmental Consultants.

OPPORTUNITIES FOR PUBLIC REVIEW

The EAP conducting the Public Participation Process ensured that information containing all relevant facts in respect of the application or proposed application is made available to interested and affected parties and participation by interested and affected parties is facilitated in such a manner that all interested and affected parties are provided with a reasonable opportunity to comment on the application or proposed application through:

- Fixing notice board at a place conspicuous to and accessible by the public
- Giving written notice
- Distribution of Background Information Document (BID) with registration form for Interested and Affected Parties. The BID was circulated on the 29th of March 2023 and can be obtainable from Indaloenhle Environmental Consultants website (www.indaloenhle.co.za) or through means of communication stipulated hereunder.

ALL COMMENTS AND QUERIES TO BE SUBMITTED TO:

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Disclaimer

The opinions expressed in this BAR are based on the information supplied to Indaloenhle Environmental Consultants. Indaloenhle Environmental Consultants has exercised all due care in reviewing the supplied information. Whilst Indaloenhle Environmental Consultants has compared key supplied data with expected outcomes, and duly interrogated all information supplied to us, the accuracy of the results and conclusions from the review are entirely reliant on the accuracy and completeness of the supplied data. Indaloenhle Environmental Consultants does not accept responsibility for any errors or omissions in the supplied information and does not accept any consequential liability arising from commercial decisions or actions resulting from them. Opinions presented in this report apply to the site conditions and features as they existed at the time of Indaloenhle Environmental Consultants' investigations, and those reasonably foreseeable. These opinions do not necessarily apply to conditions and features that may arise after the date of this BAR, about which Indaloenhle Environmental Consultants had no prior knowledge nor had the opportunity to evaluate.

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I – SPECIALIST DECLARATIONS [COPIES]

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GLOSSARY

Activity [Development] – an action either planned or existing that may result in environmental impacts through pollution or resource use.

Alternative – a possible course of action, in place of another, of achieving the same desired goal of the proposed project. Alternatives can refer to any of the following but are not limited to site alternatives, site layout alternatives, design or technology alternatives, process alternatives or a no-go alternative.

Applicant – the project proponent or developer responsible for submitting an environmental application to the relevant environmental authority for environmental authorisation.

Bench Wetland - an area of mostly level or nearly level high ground [relative to the broad surroundings], including hilltops / crests [areas at the top of a mountain or hill flanked by down-slopes in all directions], saddles [relatively high-lying areas flanked by down-slopes on two sides in one direction and up-slopes on two sides in an approximately perpendicular direction], and shelves / terraces / ledges [relatively high-lying, localised flat areas along a slope, representing a break in slope with an up-slope one side and a down-slope on the other side in the same direction].

Biodiversity – the diversity of animals, plants and other organisms found within and between ecosystems, habitats, and the ecological complexes.

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

Cumulative Impacts – impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present, or reasonably foreseeable future activities to produce a greater impact or different impacts.

Direct Impacts – impacts that are caused directly by the activity and generally occur at the same time and at the same place of the activity. These impacts are usually associated with the construction, operation or maintenance of an activity and are generally quantifiable.

Ecological Reserve – the water that is necessary to protect the water ecosystems of the water resource. It must be safeguarded and not used for other purposes. The Ecological Reserve specifies both the quantity and quality of water that must be left in the national water resource. The Ecological Reserve is determined for all major water resources in the different water management areas to ensure sustainable development.

Ecosystem – a dynamic system of plant, animal [including humans] and micro-organism communities and their non-living physical environment interacting as a functional unit. The basic structural unit of the biosphere, ecosystems are characterised by interdependent interaction between the component species and their physical surroundings. Each ecosystem occupies a space in which macro-scale conditions and interactions are relatively homogenous.

Environment – In terms of the National Environmental Management Act [NEMA] [Act No 107 of 1998] [as amended], “*Environment*” means the surroundings within which humans exist and that are made up of:

- a) *the land, water, and atmosphere of the earth*
- b) *micro-organisms, plants, and animal life*
- c) *any part or combination of [a] or [b] and the interrelationships among and between them; and*
- d) *the physical, chemical, aesthetic, and cultural properties and conditions of the foregoing that influence human health and wellbeing.*

Environmental Assessment– the generic term for all forms of environmental assessment for projects, plans, programmes, or policies and includes methodologies or tools such as environmental impact assessments, strategic environmental assessments, and risk assessments.

Environmental Authorisation [EA] – an authorisation issued by the competent authority in respect of a listed activity, or an activity which takes place within a sensitive environment.

Environmental Assessment Practitioner – the individual responsible for planning, management and coordination of environmental impact assessments, strategic environmental assessments, environmental management programmes or any other appropriate environmental instrument introduced through the EIA Regulations.

Environmental Impact – a change to the environment [biophysical, social and / or economic], whether adverse or beneficial, wholly, or partially, resulting from an organisation’s activities, products, or services.

Environmental Impact Assessment [EIA] – the process of identifying, predicting, evaluating, and mitigating the biophysical, social, and other relevant effects of development proposals prior to major decisions being taken and commitments made.

Environmental Issue – a concern raised by a stakeholder, interested, or affected parties about an existing or perceived environmental impact of an activity.

Environmental Management – ensuring that environmental concerns are included in all stages of development, so that development is sustainable and does not exceed the carrying capacity of the environment.

Environmental Management Programme – A detailed plan of action prepared to ensure that recommendations for enhancing or ensuring positive impacts and limiting or preventing negative environmental impacts are implemented during the life cycle of a project. This EMP focuses on the construction phase, operation [maintenance] phase and decommissioning phase of the proposed project.

Expansion – means the modification, extension, alteration or upgrading of a facility, structure, or infrastructure at which an activity takes place in such a manner that the capacity of the facility or the footprint of the activity is increased.

Fatal Flaw – issue or conflict [real or perceived] that could result in developments being rejected or stopped.

General Waste – household water, construction rubble, garden waste and certain dry industrial and commercial waste which does not pose an immediate threat to man or the environment.

Hazardous Waste – waste that may cause ill health or increase mortality in humans, flora, and fauna.

Indirect Impacts – indirect or induced changes that may occur because of the activity. These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken, or which occur at a different place because of the activity.

Integrated Environmental Management – a philosophy that prescribes a code of practice for ensuring that environmental considerations are fully integrated into all stages of the development and decision-making process. The IEM philosophy [and principles] is interpreted as applying to the planning, assessment, implementation, and management of any proposal [project, plan, programme, or policy] or activity – at local, national, and international level – that has a potentially significant effect on the environment. Implementation of this philosophy relies on the selection and application of appropriate tools for a particular proposal or activity. These may include environmental assessment tools [such as

strategic environmental assessment and risk assessment], environmental management tools [such as monitoring, auditing, and reporting] and decision-making tools [such as multi-criteria decision support systems or advisory councils].

Interested and Affected Party – for the purposes of Chapter 5 of the NEMA and in relation to the assessment of the environmental impact of a listed activity or related activity, means an interested and affected party contemplated in Section 24[4] [a] [v], and which includes – [a] *any person, group of persons or organisation interested in or affected by such operation or activity; and [b] any organ of state that may have jurisdiction over any aspect of the operation or activity.*

Mitigate – the implementation of practical measures designed to avoid, reduce, or remedy adverse impacts or enhance beneficial impacts of an action.

No-Go Option – in this instance the proposed activity would not take place, and the resulting environmental effects from taking no action are compared with the effects of permitting the proposed activity to go forward.

Rehabilitation– a measure aimed at reinstating an ecosystem to its original function and state [or as close as possible to its original function and state] following activities that have disrupted those functions.

Sensitive Environment – any environment identified as being sensitive to the impacts of the development.

Significance – significance can be differentiated into impact magnitude and impact significance. Impact magnitude is the measurable change [i.e., magnitude, intensity, duration, and likelihood]. Impact significance is the value placed on the change by different affected parties [i.e., level of significance and acceptability]. It is an anthropocentric concept, which makes use of value judgements and science-based criteria [i.e., biophysical, social, and economic].

Stakeholder Engagement – the process of engagement between stakeholders [the proponent, authorities, and I&APs] during the planning, assessment, implementation and / or management of proposals or activities.

Sustainable Development – development which meets the needs of current generations without hindering future generations from meeting their own needs.

Watercourse – means:

a] *a river or spring*

b] *a natural channel or depression in which water flows regularly or intermittently.*

- c] *a wetland, lake, or dam into which, or from which, water flows; and*
- d] *any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse as defined in the National Water Act, 1998 [Act No. 36 of 1998] and a reference to a watercourse includes, where relevant, its bed and banks.*

Wetland – means land, which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.

ACRONYMS

BA	Basic Assessment
BAR	Basic Assessment Report
BGIS	Biodiversity Geographic Information Systems
BID	Background Information Document
CBA	Critical Biodiversity Area
CDO	Community Development Officer
CLO	Community Liaison Officer
CMA	Catchment Management Agency
CP	Conservation Plan
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DWS	Department of Water and Sanitation
DBAR	Draft Basic Assessment Report
EAP	Environmental Assessment Practitioner
KZN DEDTEA	KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs
EIA	Environmental Impact Assessment [refers to environmental management tool]
EIA	Early Industrial Age [refers to historical era]
EIS	Ecological Importance and Sensitivity
EKZN	Ezemvelo KwaZulu-Natal Wildlife
GA	General Authorisation [refers to type of water use licence authorisation]
GA	General Arrangement [refers to drawing / illustration of structures]
GIS	Geographic Information System
GPS	Geographical Positioning System

IAPs	Interested and Affected Parties
IDP	Integrated Development Plan
KZN	KwaZulu-Natal
LLO	Local Liaison Officer
LSA	Later Stone Age
MAB	Modular Ablution Blocks
MSA	Middle Stone Age
NBSAP	National Biodiversity Strategy and Action Plans
NEMA	National Environmental Management Act [Act No. 107 of 1998] [as amended]
NEM: BA	National Environmental Management Biodiversity Act [Act No. 10 of 2004]
NEM: WA	National Environmental Management Waste Act [Act No. 36 of 1998] [as amended]
NEM: AQA	National Environmental Management Air Quality Act [Act No. 39 of 2004]
NFA	National Forests Act [Act No. 84 of 1998]
NFEPA	National Freshwater Ecosystem Priority Area
NHRA	National Heritage Resources Act
NWA	National Water Act
NGO	Non-Governmental Organisation
OHSA	Occupational Health and Safety Act [Act No. 85 of 1993]
PWS	Present Ecological State
PPP	Public Participation Process
PU	Planning Unit
REC	Recommended Ecological Category
RISFSA	Road Infrastructure Strategic Framework for South Africa
SADC	South African Development Community
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Internet System
SANBI	South African National Biodiversity Institute

SANRAL	South African National Roads Agency Limited
SAPS	South African Police Services
SARTSM	South African Road Traffic Signs Manual
SDF	Standard Design Flood
SWL	Static Water Level
SMP	Storm water Management Plan
VRAI	[Riparian] Vegetation Response Assessment Index
WMA	Water Management Agency
WUL	Water Use Licence

Project Background and Introduction

CivTech Engineers (Pty) Ltd (acting on behalf of uMzinyathi District Municipality) appointed Indaloenhle Environmental Consultants (Pty) Ltd to undertake the legally required application process for Environmental Authorisation for the proposed construction of Water Supply Phase 2, Sampofu under Msinga Local Municipality, uMzinyathi District Municipality of KwaZulu Natal Province. The applications and supporting documentation will be submitted to the Department of Economic Development Tourism and Environmental Affairs (DEDTEA) respectively, for consideration and decision-making.

In terms of the National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) a Basic Assessment (BA) Process is required for a development that constitutes activities identified in Section 24 of the act. In terms of Section 24(1) of NEMA, the potential impact on the environment associated with these activities must be considered, investigated, assessed, and reported on to the competent authority that has been charged by NEMA with the responsibility of granting Environmental Authorisations. The nature and extent of the proposed project is explored in more detail in this BA Report. This report has been compiled in accordance with the requirements of the EIA Regulations of December 2014 and includes details of the activity description; the site, area, and property description; the public participation process; the impact assessment; and the recommendations of the Environmental Assessment Practitioner (EAP).

An Environmental Management Programme report (EMPr) has been compiled according to Appendix G of the GNR 326 of the EIA Regulations (2017, as amended) for the construction and operational phases of the project. The EMPr has been compiled as a stand-alone document from the BAR and will be submitted to DEDTEA along with the BAR. The EMPr provides the actions for the management of identified environmental impacts emanating from the project and a detailed outline of the implementation programme to minimise and/or eliminate any anticipated negative environmental impacts and to enhance positive impacts. The EMPr provides strategies to be used to address the roles and responsibilities of environmental management personnel on site, and a framework for environmental compliance and monitoring.

Indaloenhle was assisted by specialists to comprehensively identify potentially positive and negative environmental impacts associated with the project, and where possible to provide mitigation to reduce the potentially negative impacts and to enhance the positive impacts.

Specialist input ensures the scientific vigour and a robust assessment of impacts. The specialist study that has been conducted is a Terrestrial Biodiversity Impact Assessment Study.

Environmental Impact assessment

The proponent is required to undertake a Basic Assessment (BA) in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended; the Environmental Impact Assessment Regulations (2014) as published in the Government Gazette 38282, Notice No. GNR 982 amended by GNR 326. This Basic Assessment Report (BAR) has been compiled to satisfy these requirements.

Date of the relevant notice	Activity No (s) (in terms of the relevant notice) e.g. 1(a)	Description of listed activity as per project description
R.983, 04 December 2014 Listing Notice 1	9	The development of a pipeline for Sampofu phase 2 exceeding 1000m in length for bulk transportation of water
R.983, 04 December 2014 Listing Notice 1	13	The development of 2 reservoirs (one 2,5mega litres command reservoir and megalitre distribution reservoirs) for the storage of water for Sampofu phase 2
R.983, 04 December 2014 Listing Notice 1	19	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rocks of more than 10 cubic metres

Motivation

The objective of the Sampofu Phase 2 Bulk Water Supply is to upgrade the bulk water supply infrastructure from the Sampofu Command Reservoirs to the Tugela Ferry 1 / Res A and to the eManseleni Res C (R34) Reservoir sites, and to construct a new bulk pipeline and reservoir (Mzishu / Reservoir X) to supply the higher lying areas in the area, in order to provide an adequate supply of potable water to reservoirs serving Ward 5 and 7 areas of the uMsinga Local Municipality.

The project requirements are such that the total water demand requirements for the surrounding areas which are supplied via the Sampofu Command Reservoir to Tugela Ferry / Res A bulk water system are accommodated within this bulk supply upgrade. The existing Tugela Ferry supply pipelines from Sampofu Command Reservoir has several illegal connections, through which the some of the adjacent residents obtain water. These illegal connections impact significantly on the

supply, and the Scope of Works for this project thus needs to ensure that all communities have access to potable water supply.

Site alternatives

The proposed project site has been identified as a site requiring intervention in terms of infrastructure. No off-site or other site-specific alternatives have been investigated since the proposed development is site specific.

Layout consideration

When selecting an appropriate design for infrastructure required, several factors need to be considered. To begin with, the need for such a structure must be demonstrated from a socio-economic perspective, notwithstanding the considerations given to the guidelines for assessing and demonstrating the needs and desirability of the project and development as a whole [General Notice 891 [DEA, 2014]]. The location must ensure that the proposed structure adds value by creating key linkages for as many communities as possible, and specifically, for the target communities.

The preferred structures had to adequately meet all the above motioned design goals. The criteria, upon which the design of the infrastructure is based, encumber numerous factors such as:

- Surrounding topography
- Geology
- Construction costs associated with dimensions of the infrastructure.
- Environmental sensitivities
- Impact to watercourses
- Impact to structure [predicted]
- Consideration of future maintenance of the structure; and
- Socio-economic need

Technology alternatives

In terms of technology alternatives, the following considerations influenced the selection of the chosen specifications:

- Health, safety, and environmental considerations.
- The footprint sizes of the proposed infrastructure.
- Financial availability.

No design and structural alternatives were explored; selection of the preferred alternatives was influenced by structures within the municipal jurisdiction which served as a precedent.

Specialist studies

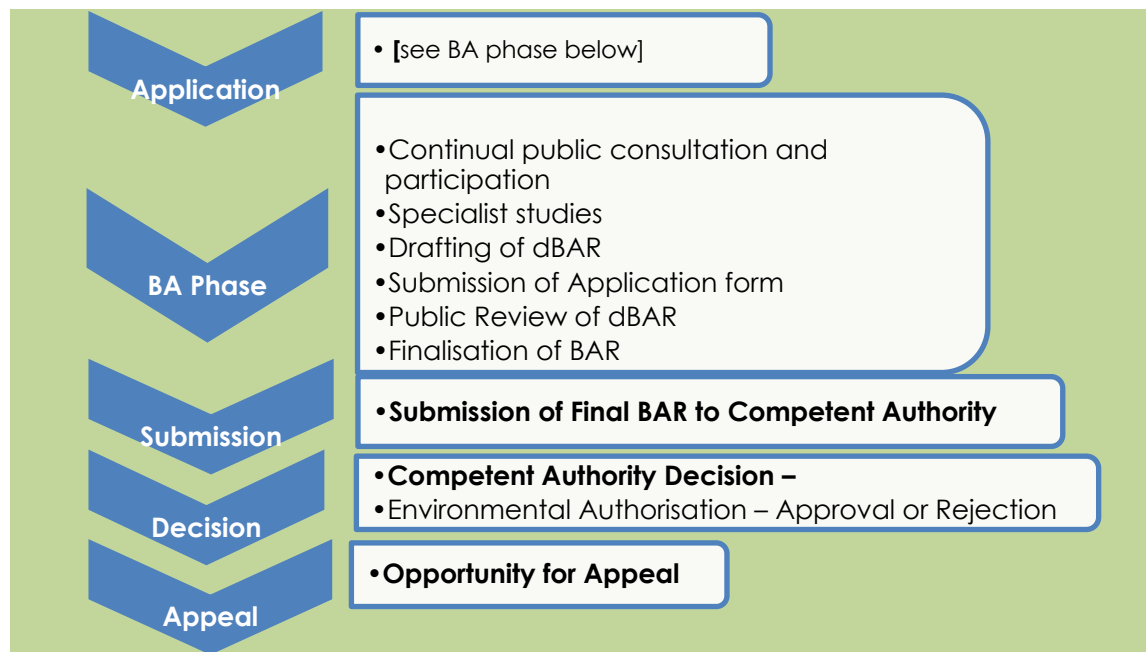
Specialist investigations were carried out as part of the Basic Environmental Impact Assessment, and include:

- Terrestrial Biodiversity Impact Assessment
- Heritage Impact Assessment
- Wetland and Aquatic Impact Assessment
- Agricultural Compliance Statement

Section 4 of this report highlights the findings of the specialist reports carried out for this project.

The Basic Assessment

This Basic Assessment [BA] follows the legislative process prescribed in the EIA Regulations [2014 as amended in 2017], as this application will be lodged under the EIA Regulations [2014, as amended in 2017]. The process is explained in the diagram below.



Principal Objective of Report

This report constitutes the BAR, which details the environmental outcomes, impacts and residual risks of the proposed activity. The report aims to assess the key environmental issues and impacts associated with the development, and to document I&APs issues and concerns. Furthermore, it provides background information of the proposed project, motivation, and details of the proposed project, and describes the public participation undertaken to date.

The objective of this report is to provide the project's I&APs, stakeholders, commenting authorities, and the CA, with a thorough project description and BA process description. The outcome being

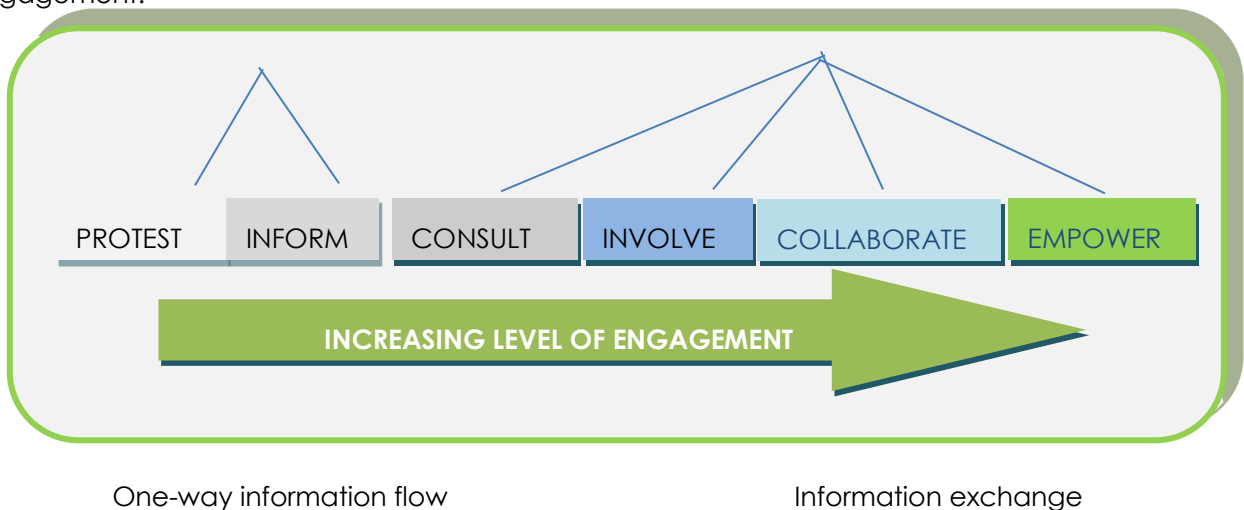
to engender productive comment / input, based on all information generated to date and presented herein. The document concludes by proposing what is believed to be a sound and environmentally risk calculated decision. To protect the environment and ensure that the development is undertaken in an environmentally responsible manner, there are several significant portions of environmental legislation that were taken into consideration during this study and are elaborated on in this report.

Regulatory Environmental Requirements

The KZN EDTEA is the competent authority for this BA process and the development needs to be authorised by this Department in accordance with the NEMA. The EIA Regulations under the NEMA consist of three [3] categories of activities namely: Listing Notice 1 Activities [GNR 327 of 2017] which require a BA Process, Listing Notice 2 Activities [GNR 325 of 2017] which require S&EIR process, and Listing Notice 3 Activities [GNR 324 of 2017] which requires a BA process for specific activities in identified sensitive geographical areas.

Public Participation Process [PPP]

Indaloenhle Environmental Consultants as the EAP is undertaking the PPP for this project as professional facilitators. It is imperative to note that the study area presents a challenge in that input from the community may be heavily reliant and dependent on the information exchange between the community leaders and a further challenge will be that of jargon barriers. However, the input from the community is essential for a complete assessment of the impacts and benefits associated with the proposed development. As such as an EAP, one is reliant on the indigenous knowledge, which will optimistically be forthcoming by the community. The figure below depicts the approach taken by Indaloenhle Environmental Consultants, where one-way information flow is avoided and information exchange is promoted, thereby enabling a higher level of engagement.



Key Findings and Conclusions

Overall, the results of the BA process emerge as having a “negative low” significance after mitigation.

Assumptions, gaps, and limitations of the study

Basic Assessment Report

The BA process followed the legislated process required and as governed and specified by the EIA Regulations [2014 as amended in 2017]. Inevitably, when undertaking scientific studies, challenges and limitations are encountered. For this specific BA, the following challenges were encountered:

The information and recommendations contained herein are based upon information provided by the client and the assumption that all relevant information has been provided by all relevant sources consulted for requisition of such information. Furthermore, field investigation work has been restricted to a level of detail that satisfies the objectives of the study.

The document has been developed with due reference to the following:

- Site visits and assessments – Indaloenhle Environmental Consultants and CivTech Engineers (Pty) Ltd
- Information on biophysical environment - Indaloenhle Environmental Consultants
- Information on the proposed works – CivTech Engineers (Pty) Ltd (Pty) Ltd
- Recommendations from the Authorities – Department of Economic Development, Tourism and Environmental Affairs

EAP Opinion and Recommendation to CA

This BAR provides an assessment of anticipated positive and negative impacts attributed to the proposed construction of Water Supply Phase 2, Sampofu. Having considered the proposal, there is unlikely to be any significant negative environmental impacts, and the socio-economic benefits are evident.

Based on the findings of environmental impact assessment, there is unlikely to be any significant negative environmental impacts and the socio-economic benefits are evident. Mitigation measures contained herein have been informed by the extent, nature, duration, and probability of impacts identified. Implementation of mitigation measures and conditions of the Environmental Management Programme appended to this document which is intended for the management of the impacts of construction of the proposed project and operation thereof, will result to minimal impacts attributed to the proposed project. Assessment findings, therefore, present no fatal flaws; the development will have long term positive impacts than negative impacts, the latter of which are short termed.

It is therefore the recommendation of the EAP that the environmental authorisation is granted for the proposed construction of Water Supply Phase 2, Sampofu under Msinga Local Municipality, uMzinyathi District Municipality of KwaZulu Natal Province.

1. BASIC ASSESSMENT DATA

1.1 APPROACH TO THE STUDY

This Basic Assessment Report [BAR] has been compiled in accordance with the stipulated requirements in Government Notice Regulation [GNR] 326 Appendix 1 of the EIA Regulations [2014 as amended in 2017], which outlines the legislative Basic Assessment [BA] process and requirements for assessment of outcomes, impacts and residual risks of the proposed development. The BAR further incorporates the findings and recommendations of the specialist studies conducted for the project.

The proposed construction of Water Supply Phase 2, Sampofu under Msinga Local Municipality, uMzinyathi District Municipality of KwaZulu Natal Province, therefore the Competent Authority [CA] is the Department of Economic Development, Tourism and Environmental Affairs [DEDTEA].

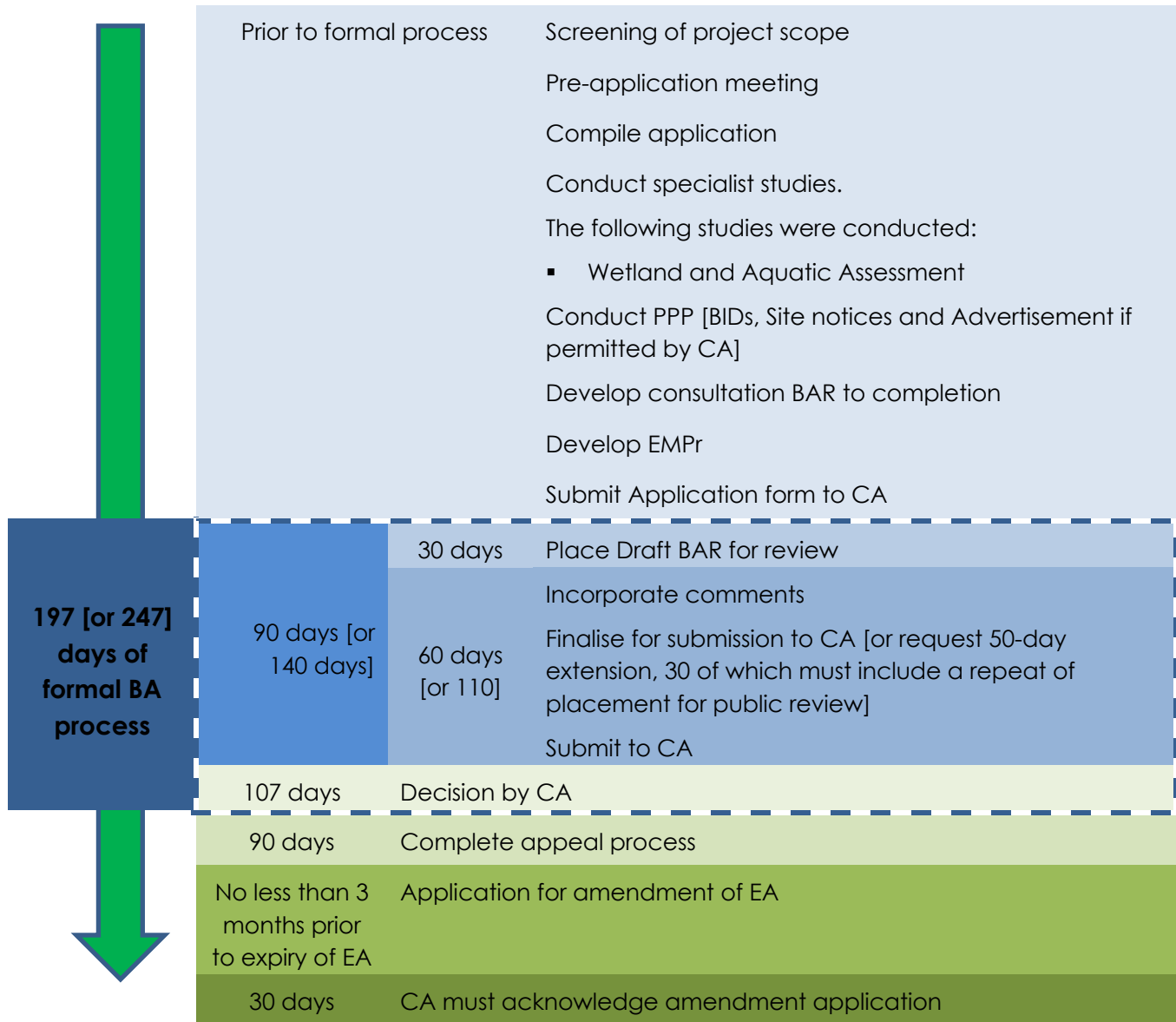
1.2 OBJECTIVES OF THE STUDY

The BA aims to achieve the following:

- Conduct a consultative process.
- Determine the policy and legislative context within which the proposed activity is undertaken and how the activity complies with and responds to the policy and legislative context.
- Identify the alternatives considered, including the activity, location, and technology alternatives.
- Describe the need and desirability of the proposed project.
- Undertake an impact and risk assessment process inclusive of cumulative impacts [where applicable]. The focus being to determine the geographical, physical, biological, social, economic, heritage and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine:
 - the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
 - the degree to which these impacts:
 - can be reversed.
 - may cause irreplaceable loss of resources; and
 - can be avoided, managed, or mitigated.
- Through a ranking of the site sensitivities and possible impacts the activity will impose on the site to:
 - identify suitable measures to avoid, manage or mitigate identified impacts; and
 - Identify residual risks that need to be managed and monitored.

Figure below illustrates the approach / methodology employed.

Basic Assessment Process – Formal 197-day process [or 247 days]



BA = Basic Assessment

BAR = Basic Assessment Report

CA = Competent Authority [EDTEA]

EA = Environmental Authorisation

EMPr = Environmental Management Programme


PPP = Public Participation Process

Figure 1: Basic Assessment Process

1.2.1 DETAILS OF THE PROJECT PROPONENT

The Applicant for the proposed project is the uMzinyathi District Municipality. The details of the Applicant are as follows:

Table 1: Details of the applicant


Applicant	uMzinyathi District Municipality	
Representative	Senzosenkosi Dumakude	
Postal Address	P.O Box 1965 DUNDEE 3000	
Telephone	(034) 219 1500	
Mobile	072 707 6486	
E-mail	dumakudes@umzinyathi.gov.za	

1.2.2 DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

The environmental team of Indaloenhle Environmental Consultants [hereafter referred to as Indaloenhle Consultants] are appointed as the Environmental Assessment Practitioner [EAP]. Indaloenhle Environmental Consultants is therefore undertaking the appropriate environmental studies for this proposed project.

Indaloenhle Environmental Consultants has been involved in and / or managed several environmental assessments in South Africa to date. A specialist area of focus is on assessment of linear developments [national and provincial roads, pipelines and power lines], bulk infrastructure and supply [e.g. wastewater treatment works, pipelines, landfills], electricity generation and transmission. For the detailed experience of the EAP, refer to Appendix H of this BAR.

Table 2: EAP details

	Detail	Indaloenhle Environmental Consultants
	Contact Persons	Mr. Divhani Mboyi Ramovha
	Address	62 Old Main Road, Kloof, 3610
	Telephone	031 003 4241
	Mobile	081 524 2226
	E-mail	divhani@indaloenhle.co.za
	Qualification	BSc Hons. Environmental Sciences EAPASA (Reg. EAP – 2019/287) SACNASP(Pr.Sci.Nat-118762)

	Experience	6+ Years
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1.3 STRUCTURE OF THE REPORT

This report has been structured to comply with the format required by the National Environmental Management Act [NEMA] [Act No. 107 of 1998] [as amended]. The contents are as follows

Chapter		Content
Chapter Basic Assessment Data	1	This chapter includes the approach to the study and details of the project proponent and EAP.
Chapter Project Context and Motivation	2	Contextualises the study area and provides a motivation and need for the proposed development.
Chapter Technical Data	3	Includes a detailed description of the proposed activities.
Chapter Environmental Context	4	Legislative Includes an explanation on all applicable legislation and the relevant listed activities applied for.
Chapter The Study	5	A description of the biophysical and social environment. Consideration of alternatives [design / layout and no-go] for the project. Overview of the public participation process conducted to date. This section also highlights the key findings of the specialist studies conducted and other environmental considerations. Includes the impact assessment methodology. The impacts identified are rated and a significance score obtained.
Chapter Study Findings & Conclusions	6	Conclusions and recommendations of the Environmental Impact Assessment. Declaration of independence by the EAP.

Figure 2: Report Structure

2. PROJECT CONTEXT AND MOTIVATION

2.1. BACKGROUND

CivTech Engineer (Pty) Ltd acting on behalf of the Applicant (uMzinyathi District Municipality) appointed Indaloenhle Environmental Consultants to undertake the legally required application process for Environmental Authorisation for the proposed construction of Water Supply Phase 2, Sampofu under Msinga Local Municipality, uMzinyathi District Municipality of KwaZulu Natal Province. The applications and supporting documentation will be submitted to the DEDTEA respectively, for consideration and decision-making.

In terms of the National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) a Basic Assessment (BA) Process is required for a development that constitutes activities identified in Section 24 of the act. In terms of Section 24(1) of NEMA, the potential impact on the environment associated with these activities must be considered, investigated, assessed, and reported on to the competent authority that has been charged by NEMA with the responsibility of granting Environmental Authorisations. The nature and extent of the proposed project is explored in more detail in this BA Report. This report has been compiled in accordance with the requirements of the EIA Regulations of December 2014 and includes details of the activity description; the site, area, and property description; the public participation process; the impact assessment; and the recommendations of the Environmental Assessment Practitioner (EAP).

An Environmental Management Programme report (EMPr) has been compiled according to Appendix G of the GNR 982 of the EIA Regulations (2014) for the construction and operational phases of the project. The EMPr has been compiled as a stand-alone document from the BAR and will be submitted to the DEDTEA along with the BAR. The EMPr provides the actions for the management of identified environmental impacts emanating from the project and a detailed outline of the implementation programme to minimise and/or eliminate any anticipated negative environmental impacts and to enhance positive impacts. The EMPr provides strategies to be used to address the roles and responsibilities of environmental management personnel on site, and a framework for environmental compliance and monitoring.

Indaloenhle was assisted by specialists to comprehensively identify potentially positive and negative environmental impacts associated with the project, and where possible to provide mitigation to reduce the potentially negative impacts and to enhance the positive impacts. Specialist input ensures the scientific vigour and a robust assessment of impacts. The specialist studies undertaken include Terrestrial Biodiversity Impact Assessment, Wetland and Aquatic Assessment, Heritage Impact Assessment and Agricultural Compliance Assessment.

2.2. SURVEYOR GENERAL NUMBERS / PROPERTY DESCRIPTIONS:

The project is located approximately 40km north of Greytown within the Town of Tugela Ferry. The town is situated adjacent to the Tugela River bridge crossing with approximate coordinates of S28°43'43"; E30°21'47". The project area for the Sampofu bulk water supply Phase 2 project, as derived from the regional planning, effectively encompasses portions of Ward 5, and a small portion of Ward 7 of uMsinga Local Municipality incorporating various sub wards as well as the Tugela Ferry town. uMsinga LM falls with the uMzinyathi District Municipality (District Code DC24). The project area is predominantly within Ebathenjini Tribal Authority, with the source located within Ward 4. An Overall Layout Plan of the project area is included in Annexure A.

Table 3: Project location information

District Municipality	Umzinyathi District Municipality (DC24)																				
Local Municipality	Msinga Local Municipality																				
Wards	Ward 5 and 7																				
Co-ordinates:	Latitude								Longitude												
Tugela ferry bridge	28°46'11"S								30°26'07"E												
Proposed Reservoir	28°47'23"S								30°26'56"E												
Malomeni	28°46'12"S								30°26'09"E												
Property Description:	Mthembu 17484 GT																				
21 Digit Surveyor General no.	N	0	G	U	0	0	0	0	0	0	0	0	1	7	4	8	4	0	0	0	0

2.2.1. SURROUNDING LAND USES

Table 4: Surrounding land uses in proximity to the proposed project site.

Natural area	Y	Light industrial	N
Low density residential	Y	Medium industrial	N
Medium density residential	Y	Heavy industrial	N
High density residential	Y	Power station	N
Informal residential	Y	Military or police base/station/compound	N
Retail commercial & warehousing	N	Spoil heap or slimes dam	N
Office/consulting room	N	Dam or reservoir	N
Quarry, sand or borrow pit	N	Hospital / medical centre	N
School	Y	Tertiary education facility	N

Church	Y	Old age home	N
Sewage treatment plant	N	Train station or shunting yard	N
Railway line	N	Major road [4 lanes or more]	N
Harbour	N	Plantation	N
Sport facilities	N	Agriculture	Y
Golf course	N	River, stream, or wetland	Y
Polo fields	N	Nature conservation area	N
Filling station	N	Mountain, koppie or ridge	Y
Landfill or waste treatment site	N	Museum	N
Historical building	N	Protected Area	N
Graveyard	Y	Archaeological site	N
Airport	N	Other:	N

Key: Y = Yes P = Possibly N = No

2.3. PROJECT MOTIVATION AND NEED AND DESIRABILITY

Table 5: Proposed project need, desirability, and benefits

Project Need		
<p>The objective of this Sampofu Bulk Water Supply Phase 2 is to upgrade the bulk water supply infrastructure from the Sampofu Command Reservoirs to the Tugela Ferry 1 / Res A and to the eManseleni Res C (R34) Reservoir sites, and to construct a new bulk pipeline and reservoir (Mzishu / Reservoir X) to supply the higher lying areas in the area, in order to provide an adequate supply of potable water to reservoirs serving Ward 5 and 7 areas of the uMsinga Local Municipality.</p> <p>The project requirements are such that the total water demand requirements for the surrounding areas which are supplied via the Sampofu Command Reservoir to Tugela Ferry / Res A bulk water system are accommodated within this bulk supply upgrade. The existing Tugela Ferry supply pipelines from Sampofu Command Reservoir has a number of illegal connections, through which the some of the adjacent local residents obtain water. These illegal connections impact significantly on the supply, and the Scope of Works for this project thus needs to ensure that all communities have access to potable water supply.</p>		
1.	<p>Was the relevant provincial planning department involved in the application?</p> <p>uMzinyathi District Municipality is responsible for local infrastructure and planning and is also the project Applicant.</p>	YES
2.	<p>Does the proposed land use fall within the relevant provincial planning</p>	YES

	<p>framework?</p> <p>This is an infrastructure project thus it can be considered to be part of the PSDF, by virtue of increasing affordable, sustainable and conducive houses to improve the quality of people's lives.</p>		
3.	<p>If the answer to questions 1 and / or 2 was NO, please provide further motivation / Explanation – N/A.</p>		
<p>Desirability</p> <p>The proposed project forms part of a larger undertaking by uMzinyathi District to meet the infrastructural needs of the area. The existing water supply system in the Sampofu area currently does not have the capacity to provide sufficient potable water to residents of Malomeni and the surrounding villages. A number of pipelines and reservoirs have been proposed to meet the future water demands of the Sampofu Phase 2. This propose project, therefore, will transport water from the Sampofu Reservoir to Sampofu Phase 2 itself.</p> <p>The proposed project is desirable as it will improve the quality of people's lives by providing affordable, sustainable, and conducive housing infrastructure and access to adequate public transport facilities. Thus, this proposed project is desirable from a socio-economic perspective.</p>			
1.	<p>Does the proposed land use / development conform to the relevant structure plans, SDF and planning visions for the area?</p> <p>The approval of this application will not compromise the IDP or the SDF but will serve as key enabling support to these plans. Threat to the infrastructure capacity in residential areas by increasing population density has been identified; thus, the proposed development will remove some of the impending capacity problems foreseen in future.</p>	YES	
3.	<p>Will the benefits of the proposed land use / development outweigh the negative impacts of it?</p> <p>The positive benefits will outweigh negative impacts. Anticipated negative impacts are limited to the construction phase and to a lesser extent during operational phase. With implementation of mitigation measures, significance level of negative impacts will be low.</p>	YES	
4.	<p>If the answer to any of the questions 1-3 was NO, please provide further motivation / Explanation – N/A.</p>		

5.	Will the proposed land use / development impact on the sense of place?		NO
6.	Will the proposed land use / development set a precedent? The proposed development will set a precedent.	YES	
7.	Will any person's rights be affected by the proposed land use / development? The proposed project will enhance community rights once constructed. However, during construction continuous engagement with the community is vital to ensure that no agreements are infringed, and discontentment of community members is avoided.		NO
8.	Will the proposed land use / development compromise the "urban edge"?		NO
9.	If the answer to any of the question 5-8 was YES, please provide further motivation / explanation – N/A.		
Benefits			
<p>The pipeline forms part of a larger scheme for the improved basic provision of water, which will improve sanitation and improve living standards for a number of previously disadvantaged areas, and potentially allow for the future development of these areas. The proposed development will contribute to water and sanitation improvement in households and social facilities such as schools and hospitals. Temporary employment opportunities will also be gained during the construction phase which will provide temporary financial relief.</p> <p>Residents of Sampofu, and ultimately Malomeni and surroundings, will be provided with a reliable supply of potable water. This is likely to prevent reliance on illegal taps or broken pipes for water. The provision of this basic service is likely to contribute towards an improved quality of life. In addition to the above, employment opportunities and capacity building are likely to be provided to local communities. Job opportunities will be created through the employment of local low category contractors.</p>			
1.	Will the land use / development have any benefits for society in general?	YES	
2.	Explain: The proposed development will contribute to water and sanitation improvement in households and social facilities such as schools and hospitals. Temporary employment opportunities will also be gained during the construction phase which will provide temporary financial relief.		
3.	Will the land use / development have any benefits for the local communities where it will be located?	YES	
4.	Explain: The proposed development will contribute to water and sanitation improvement in		

households and social facilities such as schools and hospitals.

2.3.1. SOCIO-ECONOMIC VALUE OF THE ACTIVITY

Table 6: Socio-economic value of the proposed project

Description	Value
What is the expected capital value of the activity on completion?	N/A
What is the expected yearly income that will be generated by or as a result of the activity?	N/A
Will the activity contribute to service infrastructure?	YES X NO
Is the activity a public amenity?	YES X NO
How many new employment opportunities will be created in the development and construction phase of the activity/ies?	Not Known at this point
What is the expected value of the employment opportunities during the development and construction phase?	Not Known at this point
What percentage of this will accrue to previously disadvantaged individuals?	90%
How many permanent new employment opportunities will be created during the operational phase of the activity?	N/A
What is the expected current value of the employment opportunities during the first 10 years?	N/A
What percentage of this will accrue to previously disadvantaged individuals?	N/A

3. DESCRIPTION OF THE PROJECT

CivTech Engineer (Pty) Ltd, hereinafter referred to as the Employer's Agent, has been appointed by uMzinyathi District Municipality, hereinafter referred to as the "Employer", to provide the professional civil engineering services for the proposed construction of Water Supply Phase 2, Sampofu. The Sampofu Bulk Water Supply Phase 2 comprises (Appendix B):

- a) A new 300mm diameter STEEL gravity bulk supply pipeline from the Sampofu Command Reservoir site to the Tugela Ferry / Res A Reservoir site is to be installed, running alongside the existing 200mm diameter gravity pipeline. The steel pipeline material was preferred due to the rock trenching conditions on the pipeline route and to reduce the risk of potential illegal connections.

- b) The existing pumpstation at the Tugela Ferry / Res A Reservoir site will be augmented with a new pump station comprising of 2 no. pump sets (housing 4 No. pumps in total), which will convey water to the existing Emanseleni Reservoir C (R34) and proposed Mzishu Reservoir X sites. The new pump station will be constructed and commissioned while the existing pump station remains operational. The existing 850kl reservoir will supply water to the existing and new pump stations.
- c) Interconnecting pipework at the Tugela Ferry / Reservoir A site to link the new and existing structures / reservoirs / pump stations.
- d) A new 100mm diameter STEEL bulk supply pipeline is to be installed from the new pump station at the Tugela Ferry / Res A Reservoir site and terminating at the inlet to the new Mzishu Reservoir X site (TWL 868.86msl). The existing section of the 100mm diameter steel pipeline which is currently fixed to the Tugela River Road bridge will be utilised as it is in a reasonably good condition. Provision will be made for applying a new epoxy coating and external protective wrapping to the existing section of steel pipe across the bridge if required.
- e) A section of the existing 150mm diameter bulk steel gravity supply pipeline from Reservoir B to the Emanseleni Reservoir C (695msl) will be utilized as a rising main to supply Reservoir C (R34) by connecting it to the delivery of the new pumpstation at the Tugela Ferry / Res A Reservoir site. The section of the latter steel pipeline across the Tugela River is currently fixed to the Tugela River Road bridge and will be utilised as it is in a reasonably good condition. Provision will be made for applying a new epoxy coating and external protective wrapping to the existing section of steel pipe across the bridge if required. The initial section of the existing 150mm diameter pipeline from Reservoir B will be end-capped just before Tugela Ferry and can be used to supply the Tugela Ferry / Res A high level areas reticulation.
- f) A new rectangular concrete reservoir of 1000 Kl capacity is proposed at the Emanseleni Reservoir C (R34) site to supplement the existing 500 Kl storage capacity at the site. Interconnecting pipework between the existing reservoir and proposed new reservoir will be required to optimize their operation with the same Top Water Levels being 703.80msl. Interconnecting pipework and chambers at the Emanseleni Reservoir C site to link the new and existing reservoirs will be provided.
- g) A new circular concrete reservoir of 500kl capacity is proposed at the new Mzishu Reservoir X site with a Top Water Level of 868.86msl. A new access road will be provided by the successful Contractor to enable construction of the reservoir and will ultimately serve to service and maintain the proposed new Reservoir site.
- h) The existing 200mm uPVC and 150mm steel diameter gravity pipeline from the Sampofu Command Reservoir site to the Tugela Ferry / Res A Reservoir site, which has many illegal connections, will become redundant after the installation of the proposed new 300mm diameter STEEL pipe to the Tugela Ferry / Res A site. It is proposed that the latter uPVC 200mm

pipeline be connected to the outlet of the Res A site and utilized in the reverse direction to supply the Tugela Ferry reticulation. The latter pipeline can be incorporated into the upgraded future reticulation network.

The following infrastructure is currently in existence in the project area:

Refer to the Existing and Proposed Bulk Water Flow Diagram / schematic included in Annexure B

a) Water Source

Water supply for the Sampofu Regional Supply Area is sourced / abstracted from the Tugela River and treated at the adjacent Sampofu Water Treatment Works (WTW). Bulk water is transferred via the existing bulk water infrastructure as described below. The aforementioned bulk water infrastructure from the Sampofu Water Treatment Works to the Sampofu Regional reservoirs is currently being upgraded as part of the Mthembu West Water Supply Scheme Phase 1 Project.

b) Sampofu WTW Pump Station

The existing pump station at the Sampofu Water Treatment Works currently comprises of two pumps (one standby and one duty) which pump water to the Sampofu Command Reservoir via the existing 250mm diameter uPVC pumping main. The pumpstation is being upgraded as part of the Mthembu West Water Supply Scheme Phase 1 project.

c) Pipeline from Sampofu WTW to Sampofu Command Reservoir

Water is currently conveyed from the Sampofu WTW to the Sampofu Command Reservoir via a 250mm \varnothing uPVC pumping main from the Sampofu WTW to the existing Sampofu Command Reservoir site.

d) Sampofu Command Reservoir and Pump Station

The existing Sampofu Command Reservoir is located approximately 1.4km north of the Sampofu WTW site. The Sampofu Command Reservoirs currently have a total combined storage capacity of 2M!, consisting of 2 x 500k! circular concrete reservoirs and a 1M! circular concrete reservoir. The storage capacity is being augmented with an additional 1,25M! rectangular concrete reservoir as part of the Mthembu West Water Supply Scheme Phase 1 project to cater for Mthembu West water supply demand requirements.

The pump station at the Sampofu Command Reservoir currently comprises of three pump sets, pumping separately to Mthembu West, Ngubo and Ngcengeni supply areas. The pumps to Mthembu West are being upgraded as part of the Mthembu West Water Supply Scheme Phase 1 project. The Sampofu Command Reservoir currently supplies the following downstream reservoirs / supply areas via the following bulk water pipelines:

- 200mm \varnothing gravity line from Sampofu Command Reservoir to Tugela Ferry 1 / Res A Reservoir.

- 90mm Ø UPVC pumping main from Sampofu Command Reservoir to Mthembu West (being upgraded to 200mm PVC-O as part of the Mthembu West Water Supply Scheme Phase 1 project).
- 150mm Ø steel pumping main from Sampofu Command Reservoir to Ngubo.
- 100mm Ø steel pumping main from Sampofu Command Reservoir to Ngcengeni

e) Tugela Ferry 1 / Res A Reservoir Site and Pumpstations

The Tugela Ferry 1 / Res A Reservoirs currently have a total storage capacity of 2,05Mℓ, consisting of 1 x 850kℓ below ground concrete rectangular reservoir with TWL of 621.70 msl, a 1Mℓ concrete circular reservoir with TWL 624,5 msl and a 200Kl circular steel tank of TWL 622 msl. There is an existing pumpstation adjacent to Tugela Ferry 1 Reservoir, which is utilized to pump water to the existing Res B / Ezibomvini Reservoir site. The capacity of this pumpstation is currently rated at 960kℓ/day and equipped with KSB WKIn 65/3 duty and standby pumps. A new small pumpstation which has recently been constructed and still to be commissioned by others will pump water to the new Reservoir 7 (R22) which supplies the Mbono area.

f) Res B / Msinga 2 Bulk Reservoir Site

The Msinga 2 / Res B Reservoir site currently has a total combined storage capacity of 2 Mℓ, consisting of 2 x 1Mℓ circular concrete reservoirs and a pump station. The Res B / Ezibomvini Reservoir supplies water to the Tugela Ferry and Ezibombvini high level supply area. The Msinga 2 1Mℓ reservoir and the pumpstation are supplied by a separate 350mm steel pipeline from the Sampofu Command Reservoir and form part of the Msinga/Pomeroy bulk water scheme.

g) Res C / Emanseleni Reservoir Site

The existing Emanseleni (Res C) Reservoir site currently has a total storage capacity of 500 Kℓ, consisting of 1 x 500Kℓ circular concrete reservoir.

h) Msinga Bulk Water Supply

The Msinga bulk water system comprises of an existing pumpstation which pumps water from the Sampofu WTW via a 350mm diameter steel pipeline to the Msinga 1 Reservoir located at the Sampofu Command Reservoir site. Water is then pumped onwards from Msinga 1 Reservoir, via a 350mm diameter steel pipeline to the Msinga 2 Reservoir located adjacent to Res B, and then pumped onwards towards Msinga 3 Reservoir.

i) Tugela Ferry Reticulation

Accurate as-built layouts of the existing reticulation in the Tugela Ferry and surrounding areas could not be obtained, however based on the site visit and interaction with the operations team, there were indications as to the extent of the reticulation from each reservoir site and that there are illegal

connections along the existing bulk pipeline to Tugela Ferry, through which some of the residents alongside this pipeline obtain their water supply. A more in-depth assessment of the existing reticulation network is required which falls outside the scope of this project.

Based on the information made available to Indaloenhle Environmental Consultants and the Department of Environmental, Tourism, Tourism and Environmental Affairs' (DEDTEA) opinion, the proposed development trigger NEMA, GNR 327, LN 1, activity 9, activity 13 and activity 19 thus, requires undertaking of the Basic Assessment Process.

4. ENVIRONMENTAL LEGISLATIVE CONTEXT

In order to protect the environment and ensure that the development is undertaken in an environmentally responsible manner, there are a number of significant pieces of environmental legislation that need to be considered during this study. This section outlines the applicable national legislations which needs to be taken cognisance of.

4.1. THE CONSTITUTION OF SOUTH AFRICA

Section 24 of the Constitution of South Africa [No. 108 of 1996] states that:

"...everyone has the right – ... [a] to an environment that is not harmful to their health or well-being; and ... [b] to have the environment protected, for the benefit of present and future generations through reasonable legislative and other measures that ... [c] secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."

This protection encompasses preventing pollution and promoting conservation and environmentally sustainable development. These principles are embraced in the NEMA and given further expression.

4.2. NATIONAL ENVIRONMENTAL MANAGEMENT ACT [ACT NO. 107 OF 1998]

The National Environmental Management Act [Act No. 107 of 1998] [as amended], or otherwise known as NEMA, is South Africa's overarching environmental legislation and, as per its primary objective, provides for co-operative, environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by organs of state, and to provide for matters connected therewith.

The principles of the Act are the following:

- Environmental management must place people and their needs at the forefront of its concern;
- Development must be socially, environmentally and economically sustainable;

- Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated;
- Environmental justice must be pursued so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person;
- Equitable access to environmental resources, benefits and services to meet basic human needs and ensure human well-being must be pursued;
- Responsibility for the environmental health and safety consequences of a policy, programme, project or activity exists throughout its life cycle.
- The participation of all interested and affected parties in environmental governance must be promoted;
- Decisions must take into account the interests needs and values of all interested and affected parties, and this includes recognizing all forms of knowledge including traditional and ordinary knowledge;
- Community well-being and empowerment must be promoted through environmental education, the raising of environmental awareness;
- The social, economic and environmental impacts of activities including disadvantages and benefits, must be considered, assessed and evaluated and decisions must be appropriate in the light of such consideration and assessment;
- The right of workers to refuse work that is harmful to human health or the environment;
- Decisions must be taken in an open and transparent manner, and access to information must be provided in accordance with the law;
- There must be intergovernmental co-ordination and harmonisation of policies, legislation and actions relating to the environment;
- The environment is held in public trust for the people, the beneficial use of the environment resources must serve the public interest and the environment must be protected as the people's common heritage;
- The cost of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment; and
- The vital role of women and youth in environmental management and development must be recognised and their full participation therein must be promoted.

4.3. EIA REGULATIONS [2014] [AS AMENDED IN 2017]

On April 7th of 2017, the Minister of Environmental Affairs, Bomo Edith Edna Molewa, made amendments to the EIA Regulations, 2014, published under Government Notice No. 982 in Gazette No. 3822 of 4 December 2014, in terms of sections 24[5] and 44 of the NEMA, 1998 [Act No. 107 of 1998], as well as to Listing Notice 1 of 2014, published under Government Notice No. 983 in Gazette No. 38282 on 4 December 2014, as well as Listing Notice 2 of 2014, published under Government Notice No. 984 in Gazette No. 38282 on 4 December 2014, and Listing Notice 3 of 2014, published under Government Notice No. 985 in Gazette No. 38282 on 4 December 2014 in terms of sections 24[2], 24[5], 24D and 44, read with section 47A[1][b] of the NEMA, 1998 [Act No. 107 of 1998].

For ease of reading, the 2017 Amendments of the EIA Regulations, 2014 are published in full, inclusive of amendments made thereto. These amendments commenced on the date that these regulations were published in the Gazette, 07 April 2017.

The nature of the proposed project includes activities listed in the following Listing Notices – GNR 324 [Listing Notice 3] of the EIA Regulations [2014 as amended in 2017] – refer to the table below:

Table 7: Listed activities of the EIA Regulations [2014 as amended in 2017]

Date of the relevant notice	Activity No (s) (in terms of the relevant notice) e.g. 1(a)	Description of listed activity as per project description
R.983, 04 December 2014 Listing Notice 1	9	The development of a pipeline for Sampofu phase 2 exceeding 1000m in length for bulk transportation of water
R.983, 04 December 2014 Listing Notice 1	13	The development of 2 reservoirs (one 2,5mega litres command reservoir and megalitre distribution reservoirs) for the storage of water for Sampofu phase 2
R.983, 04 December 2014 Listing Notice 1	19	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rocks of more than 10 cubic metres

4.4. NATIONAL WATER ACT [ACT NO. 36 OF 1998] [AS AMENDED]

The National Water Act [NWA] is a legal framework for the effective and sustainable management of water resources in South Africa. Central to the NWA is recognition that water is a scarce resource in the country, which belongs to all the people of South Africa and needs to be managed in a sustainable manner to benefit all members of society. The NWA places a strong emphasis on the protection of water

resources in South Africa, especially against its exploitation, and the insurance that there is water for social and economic development in the country for present and future generations.

Water use in South Africa is managed through a water use authorisation process, which requires that every water use is authorised by the Department of Water and Sanitation [DWS, previously known as the Department of Water Affairs] or an established Catchment Management Agency [CMA, if applicable for that region] once the water requirements for the Reserve have been determined.

A water use must be licenced unless it [a] is listed in Schedule 1, [b] is an existing lawful use, [c] is permissible under a general authorisation [GA], or [d] if a responsible authority waives the need for a licence. If none of these are relevant a so-called water, use licence [WUL] must be applied for and obtained prior to the commencement of such listed activity. The Identified water uses in terms of Section 21 of the National Water Act 36 of 1998 are as listed below:

Table 8: Section 21 water uses.

NWA Section 21	Sec21 (c)	The installation of pipe will impede or divert the water flow of the stream
NWA Section 21	Sec 21 (i)	The activity will alter the bed, banks, or characteristics of a water course

In terms of such a WUL, the Minister may choose to limit the amount of water, which a responsible authority [e.g., CMA, water board, municipality] may allocate. In making regulations and determining items such as GAs, the Minister may differentiate between different water resources, classes of water resources, and geographical areas. The NWA defines a water resource to be a watercourse, surface water, estuary, or groundwater [aquifer]. Included under surface water are manmade water channels, estuaries, and watercourses.

4.5. NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT [ACT NO. 10 OF 2004]

The project must comply with the National Environmental Management: Biodiversity Act [Act No. 10 of 2004] [NEM: BA] in providing the cooperative governance in biodiversity management and conservation. NEM: BA provides for the Minister to publish a notice in the Government Gazette that issues norms and standards, and indicators for monitoring progress for the achievement of any of the objectives of the Act.

The NEM: BA also provides for:

- The National Biodiversity Framework
- Bioregional Plans
- Biodiversity Management Plans

- Biodiversity Management Agreements
- The identification, listing and promotion of threatened or protected ecosystems; and
- Alien invasive species control and enforcement.

4.6. NATIONAL SPATIAL BIODIVERSITY ASSESSMENTS [2004, 2011]

This informs the policies, plans and day-to-day activities of a wide range of sectors both public and private. A spatial biodiversity assessment can take place at different spatial scales, from global to local. It involves mapping information about biodiversity features such as species, habitats and ecological processes, protected areas and current and future patterns of land and resource use. It provides a national context for assessments at the sub national scale and points to broad priority areas where further investigation, planning and action are warranted.

It identifies three keys' strategies for conserving South Africa's biodiversity existence from the assessment, namely:

- Pursuing opportunities to link biodiversity and socio-economic development in priority geographic areas.
- Focusing on emergency action on threaten ecosystem, to prevent further loss of ecosystem functioning; and
- Expanding of the protected area network.

4.7. NATIONAL BIODIVERSITY STRATEGY AND ACTION PLANS [2005]

The National Biodiversity Strategy and Action Plans [NBSAP] aims to conserve and manage terrestrial and aquatic biodiversity to ensure sustainable and equitable benefits to the people of South Africa, now and in the future. In South Africa, terrestrial, inland water, coastal and marine ecosystems, and their associated species are widely used for commercial, semi-commercial and subsistence purposes through both formal and informal markets.

While some of this use is well managed and / or is at levels within the capacity of the resource for renewal, much is thought to be unsustainable. "Use" in this case refers to direct use, such as collecting, harvesting, hunting, fishing, etc. for human consumption and production, as well as more indirect use such as ecotourism.

4.8. NATIONAL ENVIRONMENTAL MANAGEMENT: PROTECTED AREAS ACT [ACT NO. 57 OF 2003]

Protected areas are a fundamental tool for achieving biodiversity objectives and protecting essential natural heritage areas and ecosystems services, since these often provide greater security for

conservation-worthy land than the agreements or land use limitations provided for in the National Environmental Management: Biodiversity Act.

The National Environmental Management: Protected Areas Act [Act No. 57 of 2003] [NEM: PAA] creates a legal framework and management system for all protected areas in South Africa as well as establishing the South African National Parks [SANParks] as a statutory board. Each conservation area will have its own set of land use restrictions or regulations that stem either from generic restrictions under NEM: PAA, or customized regulations for individual protected areas.

4.9. KZN NATURE CONSERVATION ORDINANCE [ORDINANCE NO. 15 OF 1974]

Protected indigenous plants in general are controlled under the relevant provincial Ordinances or Acts dealing with nature conservation. In KwaZulu-Natal, the relevant statute is the 1974 Provincial Nature Conservation Ordinance. In terms of this Ordinance, a permit must be obtained from Ezemvelo KZN Wildlife to remove or destroy any plants listed in the Ordinance.

If, protected plant species are to be disturbed, the Applicant must pursue the necessary permit / licencing requirements from the Department of Forestry, Fisheries, and the Environment [DFFE] and Ezemvelo KZN Wildlife [EKZNW] prior to clearing of vegetation.

4.10. NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT [ACT NO. 59 OF 2008] [AS AMENDED]

The National Environmental Management Waste Act [Act No. 59 of 2008] [NEM:WA] – the ‘Waste Act’ reforms the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development; to provide for institutional arrangements and planning matters; to provide for national norms and standards for regulating the management of waste by all spheres of government; to provide for specific waste management measures; to provide for the licencing and control of waste management activities; to provide for the remediation of contaminated land; to provide for the national waste information system; to provide for compliance and enforcement; and to provide for matters connected therewith.

The objectives of this Act are:

- a) *“To protect health, well-being, and the environment by providing reasonable measures for –*
 - i. *minimising the consumption of natural resources*
 - ii. *avoiding and minimising the generation of waste*

- iii. *reducing, re-using, recycling, and recovering waste*
 - iv. *treating and safely disposing of waste as a last resort*
 - v. *preventing pollution and ecological degradation*
 - vi. *securing ecologically sustainable development while promoting justifiable economic and social development*
 - vii. *promoting and ensuring the effective delivery of waste services*
 - viii. *remediating land where contamination presents, or may present, a significant risk of harm to health or the environment; and*
 - ix. *achieving integrated waste management reporting and planning*
- b) *to ensure that people are aware of the impact of waste on their health, well-being, and the environment.*
- c) *to provide for compliance with the measures set out in paragraph [a]; and*
- d) *generally, to give effect to section 24 of the Constitution to secure an environment that is not harmful to health and well-being."*

The NEM: WA has been considered; however, no activities have been identified for the proposed development. Construction waste will be disposed of at a registered landfill and not dumped illegally.

4.11. NATIONAL HERITAGE RESOURCES ACT [ACT NO. 25 OF 1999]

In terms of Section 38 of the National Heritage Resources Act [NHRA] [subject to the provisions of subsections [7], [8] and [9] of the Act], any person who intends to undertake a development categorised as:

- The construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length
- The construction of a bridge or similar structure exceeding 50 m in length
- Any development or other activity which will change the character of a site:
- Exceeding 5 000 m² in extent
- Involving three or more existing erven or subdivisions thereof; or
- Involving three or more erven or divisions thereof which have been consolidated within the past five years; or
- The costs of which will exceed a sum set in terms of regulations by the South African Heritage Resource Agency [SAHRA] or a provincial heritage resource authority.
- The re-zoning of a site exceeding 10 000 m² in extent; or

- Any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature, and extent of the proposed development.

4.12. NATIONAL FORESTS ACT [ACT NO. 84 OF 1998]

According to this Act, the Minister may declare a tree, group of trees, woodland, or a species of trees as protected. The prohibitions provide that:

'No person may cut, damage, disturb, destroy or remove any protected tree, or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister'.

In essence the National Forests Act [NFA] prohibits the destruction of indigenous trees in any natural forest without a licence. In terms of the NFA and Government Notice 1339 of 6 August 1976 [promulgated under the Forest Act, 1984 [Act No. 122 of 1984] for protected tree species], the removal, relocation or pruning of any protected plants will require a licence.

4.13. OCCUPATIONAL HEALTH AND SAFETY ACT [ACT NO. 85 OF 1993]

The Occupational Health and Safety Act [OHSA] provides for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work, against hazards to health and safety arising out of or in connection with the activities of persons at work.

4.14. SUSTAINABLE DEVELOPMENT

The principle of Sustainable Development has been established in the Constitution of the Republic of South Africa [Act No. 108 of 1996] and given effect by NEMA. Section 1 [29] of NEMA states that sustainable development means the integration of social, economic, and environmental factors into the planning, implementation, and decision-making process to ensure that development serves present and future generations.

Therefore, Sustainable Development requires that:

- The disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised, and remedied.
- That pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied.

- The disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied.
- Waste is avoided, or where it cannot be altogether avoided, minimised, and re-used or recycled where possible and otherwise disposed of in a responsible manner.
- A risk-averse and cautious approach is applied, which considers the limits of current knowledge about the consequences of decisions and actions; and
- Negative impacts on the environment and on people's environmental rights be anticipated; and, prevented and where they cannot altogether be prevented, are minimised and remedied.

4.15. NATIONAL ENVIRONMENTAL MANAGEMENT: AIR QUALITY ACT [ACT NO. 39 OF 2004]

The NEMA Air Quality Management Act [NEM: AQA] states the following as its primary objective:

"To reform the law regulating air quality to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social development; to provide for national norms and standards regulating air quality monitoring, management, and control by all spheres of government, for specific air quality measures, and for matters incidental thereto.

Whereas the quality of ambient air in many areas of the Republic is not conducive to a healthy environment for the people living in those areas let alone promoting their social and economic advancement and whereas the burden of health impacts associated with polluted ambient air falls most heavily on the poor, And whereas air pollution carries a high social, economic and environmental cost that is seldom borne by the polluter, And whereas atmospheric emissions of ozone-depleting substances, greenhouse gases and other substances have deleterious effects on the environment both locally and globally, and whereas everyone has the constitutional right to an environment that is not harmful to their health or well-being, and whereas everyone has the constitutional right 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.

And whereas minimisation of pollution through vigorous control, cleaner technologies and cleaner production practices is key to ensuring that air quality is improved, and whereas additional legislation is necessary to strengthen the Government's strategies for the protection of the

environment and, more specifically, the enhancement of the quality of ambient air, to secure an environment that is not harmful to the health or well-being of people."

4.16. HAZARDOUS SUBSTANCE ACT [ACT NO. 15 OF 1973] AND REGULATIONS

The object of the Act is *inter alia* to

'Provide for the control of substances which may cause injury or ill health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitising or flammable nature or the generation of pressure thereby in certain circumstances; for the control of electronic products; for the division of such substances or products into groups in relation to the degree of danger; for the prohibition and control of such substances'.

In terms of the Act, substances are divided into schedules, based on their relative degree of toxicity, and the Act provides for the control of importation, manufacture, sale, use, operation, application, modification, disposal and dumping of substances in each schedule.

Pollution control in South Africa is affected through numerous national statutes, provincial ordinances, and local authority by-laws. Only the more significant legislation pertaining to the regulation of water, air, noise, and waste pollution is dealt with in this section.

5. THE STUDY

5.1. PROJECT ALTERNATIVES

In terms of the EIA Regulations [2014 as amended in 2017], feasible alternatives are required to be considered as part of the environmental investigations. In addition, the obligation that alternatives are investigated is also a requirement of Section 24[4] of the NEMA [Act No. 107 of 1998] [as amended].

An alternative in relation to a proposed activity refers to the different means of meeting the general purpose and requirements of the activity, which may include alternatives to:

- the property on which or location where it is proposed to undertake the activity.
- the type of activity to be undertaken
- the design or layout of the activity
- the technology to be used in the activity.
- the operational aspects of the activity; and
- the option of not implementing the activity.

The project entails the upgrade of the Sampofu Phase 2 bulk water supply which will include the construction of two concrete reservoirs and main pipeline of 7.3 km and with a reticulation distribution network that spans 139 km. The preferred site is to construct the pipeline adjacent to the current pipeline, within the existing servitudes. However, new pipes will be laid in other areas which makes stream crossings inevitable. This will allow the pipeline to toe into the existing reservoir which requires no additional excavation within the watercourse and provides additional stability to the pipeline. The pipeline servitudes are already transformed and degraded from its original state. Realigning the pipeline would result in the transformation of previously undisturbed areas. Therefore, only one site alternative was considered in this application.

5.2. SITE AND TYPE OF ACTIVITY ALTERNATIVES

The proposed project site has been identified as a site requiring intervention in terms of infrastructure. No off-site or other site-specific alternatives have been investigated since the proposed development is site specific.

5.3. LAYOUT AND DESIGN ALTERNATIVES

For the purposes of this BA, no alternatives were considered and evaluated. The preferred alternative was deemed appropriate for the receiving environment. Selection of this alternative was influenced by similar structures within the municipality jurisdiction which served as a precedent.

5.4. DESIGN ALTERNATIVE CONSIDERATIONS

In selecting alternative structural forms, the following design goals were considered:

- Safety [strength and robustness]
- Constructability
- Durability and sustainability
- Economy; and
- Aesthetics.

The preferred structures had to adequately meet all the above motioned design goals. The criteria, upon which the design of the infrastructure is based, encumber numerous factors such as:

- Surrounding topography
- Geology
- Construction costs associated with dimensions of the infrastructure.
- Environmental sensitivities
- Impact to watercourses
- Impact to structure [predicted]
- Consideration of future maintenance of the structure; and

- Socio-economic need

When selecting an appropriate design for infrastructure required, several factors need to be considered. To begin with, the need for such a structure must be demonstrated from a socio-economic perspective, notwithstanding the considerations given to the guidelines for assessing and demonstrating the needs and desirability of the project and development as a whole [General Notice 891 [DEA, 2014]]. The location must ensure that the proposed structure adds value by creating key linkages for as many communities as possible, and specifically, for the target communities.

In this way, the aspect of safety is also addressed, as the structures are designed taking into consideration safety design requirements. Once a location is identified that is suitable to address the needs of the target communities, structural and environmental factors must be considered. These factors include:

- The use of existing structures and infrastructure.
- Identifying hydrological, geological, and ecological constraints and ensuring the design is according to engineering best practice guidelines and principles.
- Carrying out an assessment of various options to ensure a cost-effective solution is obtained; and
- Implementing best practice procedures during detailed design and construction.

Engineering requirements can be addressed in several ways. It is a basic principle of best practice to consider a range of options to address any river engineering problem or need and to carry out an options appraisal. Without considering a range of options it is not possible to determine if the chosen approach represents the most suitable option [i.e., the option that minimises ecological harm at a cost that is not disproportionately expensive]. With the above taken into consideration, the preferred alternative was selected for implementation.

5.5. DESCRIPTION OF THE STUDY AREA: BIOPHYSICAL ENVIRONMENT

5.5.1. SENSITIVITY OF THE RECEIVING ENVIRONMENT

The DFFE screening tool was consulted using the feasibility region shown in (Figure 3) which covers the geographical extent of the proposed project area. Based on the selected classification, and the environmental sensitivities of the proposed development footprint, Table 9 is a summary of the development site environmental sensitivities. The terrestrial biodiversity and animal themes were classified as having Very High Environmental Sensitivity and the Plant species category is of Medium Sensitivity (Figure 3). To explain the sensitivity rankings, the Screening tool report (Appendix B1) gives a detailed description of the site sensitivity ratings used.

Table 9: Summary of DFFE screening tool outputs

Theme	Very Sensitive	High	High Sensitivity	Medium Sensitivity	Low Sensitivity
Animal Species	X				
Plant Species				X	
Terrestrial Biodiversity	X				

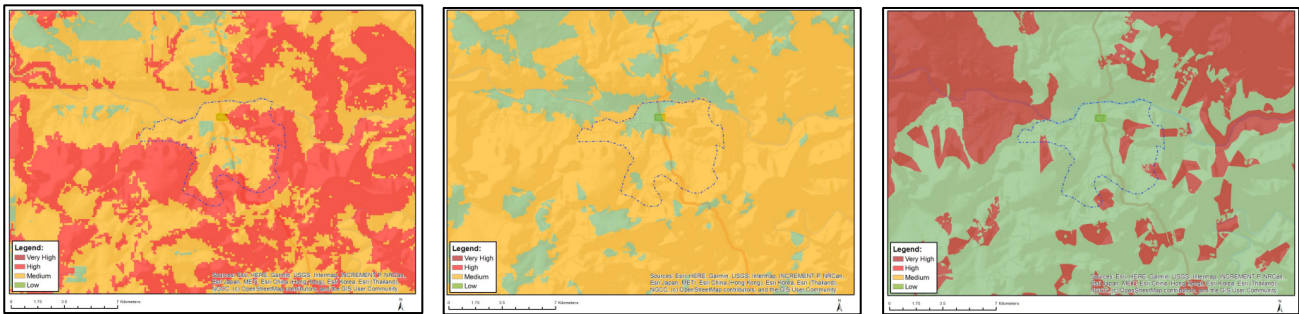


Figure 3: Environmental Sensitivity

5.5.2. CLIMATE

The climate of the area is generally sub-tropical, with almost exclusively summer rainfall. The mean annual precipitation of the area is between 500 to 800 mm (Figure 4). The mean annual temperature is 17.9°C.

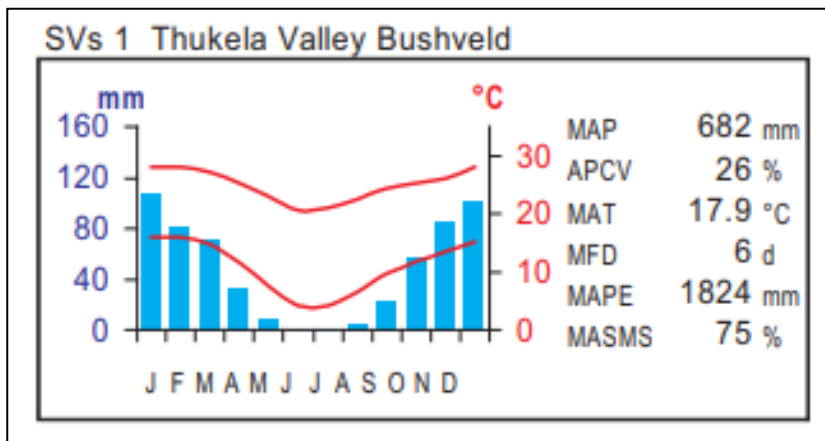


Figure 4: Climate diagram

5.5.3. LANDSCAPE AND TOPOGRAPHY

The Savanna Biome is extensively used for livestock and game ranching, including numerous well known wildlife sanctuaries. Within uMsinga (LM), settlements are mostly scattered and evenly spaced. The local

municipality is mainly used for rural dwellings and town Centre activities for employment and access to basic needs.

The bedrock geology along the pipe route varies frequently between the Vryheid Formation, which comprises shale and sandstone, and intrusive Karoo dolerite⁶. The hard rock shelf in the Thukela River, below the existing weir (WC1) is dolerite⁶. The geology of the Fb292 Land Type is mainly sandstone of the Vryheid Formation, Eccca Group, with dolerite.

5.5.4. VEGETATION

The proposed development footprint falls on the Savanna Biome. The Savanna Biome is the largest, comprising 32.5% of the land in South Africa and the Swaziland combined. The Savanna Biome is dominated by a grassy and herbaceous layer with a woody upper layer of low to tall trees. Within the Savanna Biome, the proposed development falls on the Sub-Escarpment Savanna Bioregion. The Sub-Escarpment Savanna Bioregion is noted to occur mainly inland and is frost-free. Within the Sub-Escarpment Savanna Bioregion, the geographic spatial extent of the proposed development footprint is on the delineated Thukela Valley Bushveld (SVs 1) vegetation type. The Thukela Valley Bushveld is commonly very rocky with rugged slopes and deciduous trees (Mucina and Rutherford, 2006).

5.5.5. FAUNA

Based on historical data of the Animal Demographic Units (ADU) Virtual Museum, there is a variety of fauna species that occur on site: List of mammal, reptile and amphibian species is provided in the Terrestrial Biodiversity Assessment report (Appendix E1) as per ADU Virtual Museum records using the 2830CD Quarter Degree Square.

According to the SABAP2 species list in pentad 2845_3025, the estimated total of 75 bird species occurs in the broader area of the proposed project. Figure 5 gives a spatial representation of the pentads in relation to the proposed development boundary. A list of avifauna species occurring in the broader pentad areas and might possibly be affected by the proposed development is provided in the Terrestrial Biodiversity report.

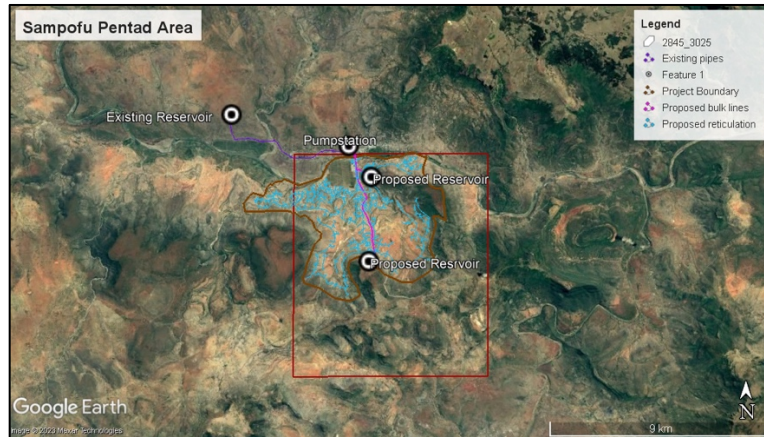


Figure 5: Spatial representative (SABAP2) development footprint

5.6. PUBLIC PARTICIPATION PROCESS

Public participation is a process that is designed to enable all interested and affected parties [I&APs] to make known their opinion and / or concerns which enables the practitioner to evaluate all aspects of the proposed development, with the objective of improving the project by maximising its benefits while minimising its adverse effects.

I&APs include all interested stakeholders, technical specialists, and the various relevant organs of state who work together to produce better decisions.

The primary aims of the public participation process are:

- to inform I&APs and key stakeholders of the proposed application and environmental studies
- to initiate meaningful and timeous participation of I&APs
- to identify issues and concerns of key stakeholders and I&APs with regards to the application for the development [i.e., focus on important issues]
- to promote transparency and an understanding of the project and its potential environmental [social and biophysical] impacts [both positive and negative]
- to provide information used for decision-making.
- to provide a structure for liaison and communication with I&APs and key stakeholders
- to ensure inclusivity [the needs, interests and values of I&APs must be considered in the decision-making process]
- to focus on issues relevant to the project, and issues considered important by I&APs and key stakeholders, and
- to provide responses to I&AP queries.

The public participation process must adhere to the requirements of Regulations 41 and 42 [GNR 982] under the NEMA [as amended]. It should be noted however that there are directions regarding measures to address, prevent and combat the spread of COVID -19 relating to National Environmental

Management Permits and Licences that were issued by the Department of Environment, Forestry and Fisheries. The purpose of the directions was to curtail the threat posed by the COVID-19 pandemic, contain, and minimise the effects of the national state of disaster and to provide directions to ensure safe licensing processes and public participation processes as required by law.

As required by the Directions, Indaloenhle developed a Public Participation Process Plan which was submitted to the Competent Authority. The Public Participation Process has been undertaken in accordance with the measures stipulated on the plan. Where possible, the requirements of Regulations 41 and 42 (GNR 982, where adhered to, deviation are stated on the Public Participation Process Plan.

The public participation process will be undertaken according to the phases outlined below.

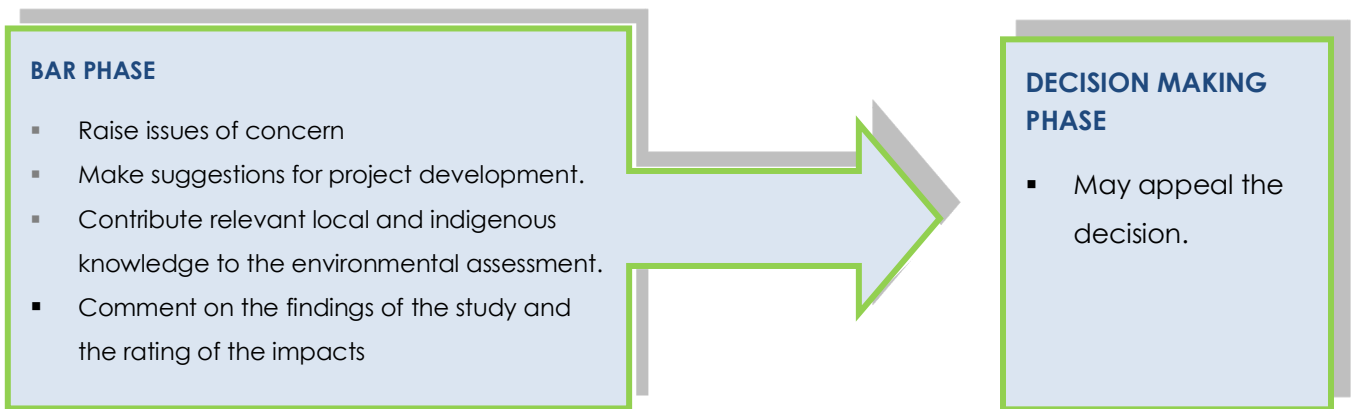


Figure 6: Responsibilities of I&APs in different PPP stages

Figure below depicts the approach taken by Indaloenhle Environmental Consultants, where one-way information flow is avoided and information exchange is promoted, thereby enabling a higher level of engagement.

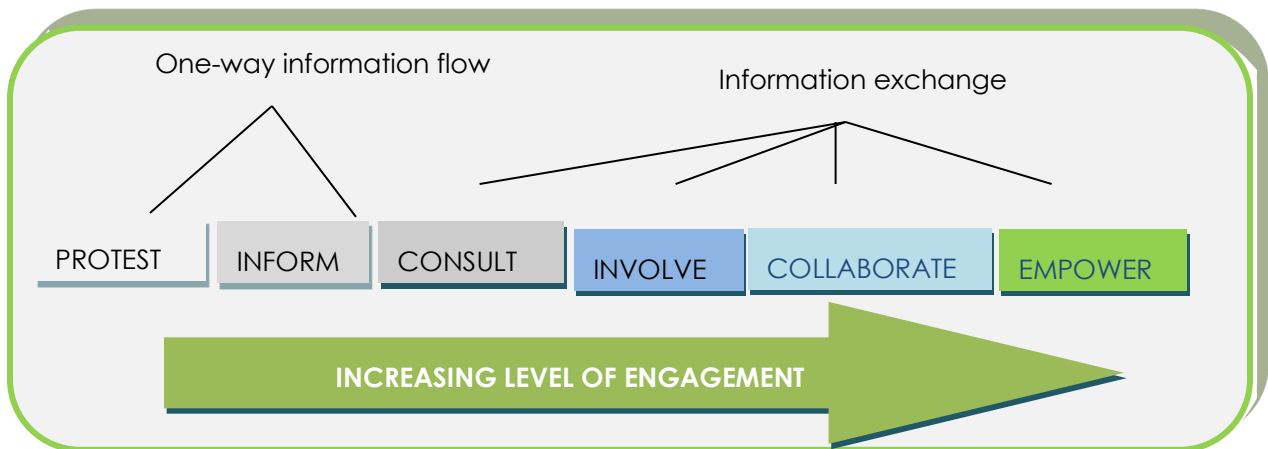


Figure 7: The stakeholder engagement spectrum (DEAT, 2002)

To achieve a higher level of engagement, several key activities have taken place. These included the following:

- The identification of stakeholders is a key deliverable at the onset, and it is noted that there are different categories of stakeholders that must be engaged, from the different levels and categories of government to the communities of wards of residential dwellings which surround the proposed development.
- The development of a living and dynamic database that captures details of stakeholders from all sectors.
- The convening of focused meetings with stakeholders during the BA process; this included engaging with community members. The continued engagement of public leaders to whom the public generally turn for information, keeping such individuals well informed about process and progress.
- The fielding of queries from I&APs and others, and providing appropriate information
- The convening of specific stakeholder groupings / forums as the need arises.
- The preparation of reports based on information gathered throughout the BA via the PPP and feeding that into the relevant decision-makers.
- The PPP includes distribution of pamphlets or Background Information Documents [BIDs] and other information packs; and
- Where appropriate site visits may be organised, as well as targeted coverage by the media.

A detailed Public Participation report is attached on **Appendix F**

5.6.1. AUTHORITY CONSULTATION

A pre-application meeting was held with Samukelisiwe Mchunu, Gerald Willis Smith and Lungile Langa from KZN EDTEA on the 12th of October 2022. The purpose of the Pre-Application Meeting was to introduce the proposed project to the EDTEA, present and confirm the relevant Listed Activities and Specialist Studies pertinent to the proposed development and that, each body, as per its guidelines and regulations can make known the recommendations pertaining the proposed project.

Key discussion items are detailed below:

- Assessing officer for the project was Samukelisiwe Mchunu.
- There are existing structures at the proposed project site.
- The proposed development triggers Activity 19 of Listing Notice 1.
- Specialist studies that were already undertaken included Terrestrial Biodiversity Impact Assessment study, Heritage Impact Assessment and Wetland and Aquatic Assessment.

- Construction works will not impact on surrounding vegetation as the proposed site has been adversely modified.
- Submission of Basic Assessment Report will be done concurrently will lodging of application.

5.6.2. CONSULTATION WITH OTHER RELEVANT STAKEHOLDERS

Consultation with other relevant key stakeholders was undertaken through written email correspondence to actively engage these stakeholders throughout the process and to provide background information about the project during the BA process. Relevant key stakeholders were consulted and notified through Bids. All relevant stakeholders were allowed an opportunity to comment on the BAR.

The identified stakeholders of this project include:

Table 10: Key Stakeholders contacted as part of the Public Participation Process

COMPETENT AUTHORITY	
Samukelisiwe Mchunu – samukelisiwe.mchunu@kznedtea.gov.za	
Department of Economic Development, Tourism & Environmental Affairs, KwaZulu-Natal	
PROVINCIAL AUTHORITY	
KwaZulu Natal AMAFA and Research Institute	John.pakwe@amafainstitute.org.za
Ezemvelo KZN Wildlife	Dominic.wieners@kznwildlife.com
Department of Water and Sanitation	makhanyak@dws.gov.za
Department of Agriculture Forestry and Fisheries	leilaneil@daff.gov.za; ngcebom@daff.gov.za
Department of Agriculture & Rural Development	Petros.mans@kzndard.gov.za; bongiwe.thabe@kzndard.gov.za

5.6.3. SITE NOTIFICATION

The EIA Regulations [2017] require that a site notice be fixed at a place conspicuous to the public at the boundary or on the fence of the site where the activity is proposed to occur. In addition, at points of access or high through traffic. The purpose of this is to notify the public of the project and to invite the public to register as Interested and Affected Parties and inform them of the PP Process. Indaloenhle Environmental Consultants erected several notices written in English at publicly accessible spaces [refer to Appendix F2].



Figure 8: Public Notice

5.6.4. IDENTIFICATION OF INTERESTED AND AFFECTED PARTIES


I&APs were identified throughout the BA process primarily from responses received from the notices mentioned above. E-mails were sent to key stakeholders and other known I&APs, informing them of the application for environmental authorization for the proposed development, the availability of the BAR for review and indicating how they may become involved in the EIA process. The contact details of all identified I&APs are recorded on the Interested and Affected Parties database, which is included in **Appendix F1**. This database will be on an on-going basis throughout the BA process.

5.6.5. ADVERTISING

In honour of Section 41(2) of the EIA Regulations promulgated under the National Environmental Management Act, notification of the commencement of the BA process for the project was advertised in the following newspapers on the 17th of April 2023 and proof of advertisement is appended to this report (see **Appendix F3**):

Monday, April 17 2023
CLASSIFIEDS
ISOLEZWE KZN

Take to the open road in your brand new car



We take care of all your motoring needs

Classifieds

ISAZISO SOKUFAKA ISICELO SOKUGUNYAZWA NGOKWEMITHETHO YEZEMVELO KANYE NELAYISENSE YOKUSEBENZISA AMANZI (WULA) OKUPHATHELENE NOKWAKHWA KWAMADAMU AMANZI KANYE NOKUFAKWA KWAMAPAYIPI AMANZI ENDAWENI YASE SAMPOFU EMSINGA NGAPHANSI KUKAMASIPALA WASE MZINYATHI, ESIFUNDAZWENI SAKWAZULU-NATALI

Lasi isaziso esinikazwa ngokwemigomo yomthethonqubo u-41 (2a) njengoba kushicilelwe kwiGazethi Kahulumeni R326 ye-Environmental Impact Assessment (EIA), ka-2017, ye-National Environmental Management Act (NEMA) (nezichibiyelo zawo) ngenhloso yokwenza uHlolo Lokuyisisekelo (Basic Assessment) ngokwakhwa kwamadamu amanzi kanyenokufakwa kwamapayipi amanzi okuhlongozwayo Kuzofakwa isicelo eMnyangweni Wezokuthuthukiswa KoMnotho, Ezokuvakasha Nezemvelo wesifundazwe saKwaZulu Natali (EDTEA) sokugunyazwa ngokwemithetho yezemvelo kwencike ekwenziweni kokwanjalo oluhlazya imithelela emvelweni.

Iphrojekthi le idinga ukugunyazwa kokulandela imithetho ebeke ngokwe-NEMA (umThetho Nombolo 107 ka-1998), ozokwenzwa kokulandela imibandela ebeke ye-Environmental Impact Assessment (EIA) Regulations, 2017 (GN No. R.326). Inqubo ye-BA ibangwa njengoba imisebenzi Esohlwini no 19 kwa-GNR 327 (Isaziso sohu 1) liothshaniswa nale phrojekthi.

IMININGWANE MAYELANA NENTHUKHO

uMasipala uMzinyathi uhlongoza ukwakha amachibi amabili amanzi, namapayipi amakhulu endaweni engu-7.3km namapayipi okusabalalisa amanzi angu-139km eSampofu ngaphakathi kukaMasipala wesiFunda uMzinyathi KwaZulu-Natali. Lo msebenzi uzobandakanya kuphela ukwakhiwa kwamadamu amanzi amabili kanye nokufakwa kwamapayipi amanzi ubude obungu-7.3km namapayipi okusabalalisa angu-139km.

Indawo: Le ndawo ingaphansi kukaMasipala waseMsinga. Indawo yomklamo itholakala epulazini lakwaMthembu (farm number 17484 GT on Portion number 0).

Indawo itholakala kulezixhumanisi: 28°46'23.56"S, 30°26'49.34"E.

Bonke abanentshisekelo futhi noma abathintekayo ngalentshukho ehlongozwayo, bayamenywa ukuba babhalise njengeqembu elinentshisekelo noma elithintekayo (Interested & Affected Party). Uyacelwa uqaphele ukuthi ama-I & APs abhalisive kuphela azokwaziwa ngamathuba amanye wokuzibandakanya kule nqubo.

Ngeminye imininqwane, ukubhaliswa njengamaqembu anentshisekelo nokuthinteka nokungeniswa imibono, sicela uxhumane no: Mnuz Divhani Rhamoba Inombolo yocingo atholaka kuyona: 0815242226/ yocingo lwase inhovisi 031 003 4241- ungathumela umqhalazo kulenombolo engemihla ubhale ukuthi "SAMPOFU" noma umqhalazo wokucela ukufonelewa lungakashayi usuku olubekiwe lokucinga okungu 17 Meyi 2023.

Indaloenhle Environmental Consultants
www.indaloenhle.co.za
62 Old Main Road, Kloof 3610
Imeyili: divhani@indaloenhle.co.za

UMZIMKHULU LOCAL MUNICIPALITY
KWA-ZULU NATAL

Umzimkhulu Local Municipality

KZN435/22/23/013/BTO
INVITATION TO TENDER

umzimkhulu Municipality hereby invites reputable and experienced Service providers to respond on the projects below:

TENDER NAME	TENDER NUMBER	BRIEFING DATE
SUPPLY AND DELIVERY OF OFFICE FURNITURE (12 Month Contract)	ULM-BTO 006/23	26/04/2023 @ 09h:30 pm.

Tender documents will be available on the municipal website (www.umzimkhulum.gov.za) and will also be available from the cashier at 169 Main Street, uMzimkhulu, 3297 upon the non-refundable payment of R100 per document or a bank guaranteed cheque made out to uMzimkhulu Municipality during working hours between 09:30am and 16:00pm from the 20th of April 2023; cut-off time for buying documents is the 26th of April 2023, 15 minutes before the briefing time.

Compulsory briefing meeting is scheduled to take place at uMzimkhulu Municipality Makhosini Building, 247 Mzimkhulu Mlonyana Street, uMzimkhulu 3297.

Invalid or non-submission of the following documents will render the Tenderer disqualified; Specific Goals points will not be allocated if the required documents are not submitted / invalid.

- Registered on Central Suppliers Database (CSD) attach proof of Registration.
- MBD 4, 8 & 9 -
- Municipal rates and services certificate / statement / billing for the directors, owners, shareholders of the company and for the company to confirm that Municipal rates are not in arrears for more than 90 days or.
- Attach valid lease agreement if the company is leasing the office space.
- Attach a valid lease agreement if the director is leasing accommodation.
- Attach affidavit if the account is under your parents, siblings, grandparents, and you are not paying any Municipal rates.

NDWEDWE LOCAL MUNICIPALITY
UMASIPALA WASE - NDWEDWE

PUBLIC NOTICE : PUBLIC NOTICE CALLING FOR
INSPECTION OF SUPPLEMENTARY VALUATION

Figure 9: Newspaper advert

Newspaper advert was made in IsiZulu (Isolezwe). I&APs have been requested to register their interest in the project and become involved in the BA process. The primary aim of the advertisement is to ensure that the widest group of I&APs possible is informed and invited to provide input, through questions and comments on the project.

5.6.6. PUBLIC MEETING

A Public Meeting is arranged with the community through community leaders and BID was distributed and all records (Attendance register) of the public meeting will be contained within the final Basic Assessment Report.



Figure 10: Public Meeting

5.6.7. ISSUES TRAIL

Issues and concerns raised in the public participation process during the BA process have been and will continue to be compiled into an Issues Trail. The Issues raised and comments is attached as **Appendix F7**, in which all comments received, and responses provided to date have been captured.

5.6.8. KEY ISSUES RAISED BY THE PUBLIC [SUMMARISED]

- Community members demanded to be informed of the construction starting date.

5.6.9. PUBLIC REVIEW OF THE DRAFT BAR

All registered I&APs were notified of the availability of the report through written and verbal communication. The dBAR was made available for authority and public review for a total of 30 days from the 10 August 2023 to 20 September 2023. The final stage in the BA process entails the capturing of responses and comments from I&APs on the dBAR to refine the BAR and ensure that all issues of significance are addressed. This report incorporates all comments by Interested and Affected Parties and findings of specialist studies prior to submission to KZN EDTEA for review and decision-making.

5.6.10. PPP SUMMARY

Table 11: Summary of Public Participation Process thus far

Activity	Description	Reference
Identifying stakeholders	Stakeholders were identified and a database of all I&APs were compiled.	Appendix F
Publishing newspaper adverts	Advertisements regarding inter alia the proposed project scope of works, location, and date for draft Basic Assessment Report review as well as details of EAP was placed in the Isolezwe newspaper on the Proof of advertisement is appended to this report.	Appendix F
Erection of site notices	A number of site notices were erected on the perimeter of the site on (29 March 2023).	Appendix F
Preparation of an on-going Issues Trail	Comments, issues of concern and suggestions received from stakeholders thus far have been captured in a Comment and Response Report (ongoing).	Appendix F
Release of Draft Reports	<p>This Draft Basic Assessment Report [dBAR] has been advertised and made available for a period of 30 days for public review and comment.</p> <p>The dBAR is available for review from the 10 August 2023 to 20 September 2023.</p>	Appendix F
Public Meetings / Open Days	A Public Meeting is was arranged with the community through community leaders and BID was distributed and all records (Attendance register) of the public meeting will be contained within the final Basic Assessment Report (29/03/2023)	Appendix F
Release of final Reports	The final Basic Assessment Report will incorporate all comments by IAPs and findings of the specialist studies, before being submitted to KZN DEDTEA for review and decision-making.	—

5.7. IMPACTS AND RESIDUAL RISKS ASSESSMENT

5.7.1. INTRODUCTION

Impact assessment must consider the nature, scale, and duration of effects on the environment, whether such effects are positive [beneficial] or negative [detrimental]. It is also imperative that each issue / impact is also assessed according to the project stages from planning, through construction and operation to the decommissioning phase. Where necessary, the proposal for mitigation or optimisation of an impact is noted.

The environmental impact assessment is focused on the following phases of the project namely: **Pre-Construction, Construction, Operational Phases and Decommissioning Phase**. The impacts associated with decommissioning phase applicable to this project and the responsible methods of post-construction clean-up are provided in the EMPr.

5.7.2. METHODOLOGY

The potential environmental impacts associated with the project are evaluated according to the nature, extent, duration, intensity, probability, and significance of the impacts, whereby:

1. Nature [N]

This is a brief written statement of the environmental aspect being impacted upon by a particular action or activity.

2. Extent [E]

Extent refers to the area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales and as such bracketing ranges are often required. This is often useful during the detailed assessment phase of a project in terms of further defining the determined significance or intensity of an impact.

- Site [1] – Within the construction site.
- Local [2] – Within a radius of 2 km of the construction site.
- Regional [3] – the scale applies to impacts on a provincial level and parts of neighbouring provinces.
- National [4] – the scale applies to impacts that will affect the whole South Africa.

3. Duration [D]

Duration indicates what the lifetime of the impact will be.

- Short-term [1] – less than 5 years.
- Medium-term [2] – between 5 and 15 years.
- Long-term [3] – between 15 and 30 years.
- Permanent [4] – over 30 years and resulting in a permanent and lasting change that will always be there.

4. Intensity [I]

Intensity describes whether an impact is destructive or benign.

- Very High [4] - Natural, cultural, and social functions and processes are altered to extent that they permanently cease.
- High [3] - Natural, cultural, and social functions and processes are altered to extent that they temporarily cease.
- Moderate [2] - Affected environment is altered, but natural, cultural, and social functions and processes continue albeit in a modified way.
- Low [1] - Impact affects the environment in such a way that natural, cultural, and social functions and processes are not affected.

5. Probability [P]

Probability describes the likelihood of an impact occurring.

- Improbable [1] - Likelihood of the impact materialising is very low.
- Possible [2] - The impact may occur.
- Highly Probable [3] - Most likely that the impact will occur.
- Definite [4] - Impact will certainly occur.

6. Cumulative [C]

In relation to an activity, means the impact of an activity that may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

7. Significance [S]

Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact.

5.7.3. RATING OF POTENTIAL IMPACTS

The potential impacts identified are explained per phase of the project and mitigation measures are provided.

Table 12: Significance ratings

Score		Elaboration
- [13 - 16 points]	NEGATIVE VERY HIGH	Permanent and important impacts. The design of the site may be affected. Intensive remediation is needed during construction and / or operational phases. Any activity which results in a “very high impact” is likely to be a fatal flaw.
- [10 - 12 points]	NEGATIVE HIGH	These are impacts which individually or combined pose a significantly high negative risk to the environment. These impacts pose a high risk to the quality of the receiving environment. The design of the site may be affected. Mitigation and possible remediation are needed during the construction and / or operational phases. The effects of the impact may affect the broader environment.
- [7 - 9 points]	NEGATIVE MODERATE	These are impacts which individually or combined pose a moderate negative risk to the quality of health of the receiving environment. These systems would not generally require immediate action, but the deficiencies should be rectified to avoid future problems and associated cost to rectify once in HIGH risk. Aesthetically and / or physically non-compliance can be expected over a medium term. In this case the impact is medium term, moderate in extent, mildly intense in its effect and probable. Mitigation is possible with additional design and construction inputs.
- [4 - 6 points]	NEGATIVE LOW	These are impacts which individually or combined pose a deleterious or adverse impact and low negative risk to the quality of the receiving environment, and may lead to potential health, safety, and environmental concerns. Aesthetically and / or physical non-compliance can be expected for short periods. In this case the impact is short term, local in extent, not intense in its effect and may not be likely to occur. A low impact has no permanent impact of significance. Mitigation measures are feasible and are readily instituted as part of a standing design, construction, or operating procedure.
0	NEUTRAL	Impact is neither beneficial nor adverse. These are impacts which cannot be classified as either positive or negative or classified and null and void in the case of a negative impact being adequately mitigated to a state where it no longer renders a risk.

Score		Elaboration
+ [4 - 6 points]	POSITIVE LOW	These are impacts which individually or combined pose a low positive impact to the quality of the receiving environment and health, and may lead to potential health, safety, and environmental benefits. In this case the impact is short term, local in extent, not intense in its effect and may not be likely to occur. A low impact has no permanent impact of significance.
+ [7 - 9 points]	POSITIVE MODERATE	These are impacts which individually or combined pose a moderate positive effect to the quality of health of the receiving environment. In this case the impact is medium term, moderate in extent, mildly intense in its effect and probable.
+ [10 - 12 points]	POSITIVE HIGH	These are impacts which individually or combined pose a significantly high positive impact on the environment. These impacts pose a high benefit to the quality of the receiving environment and health, and may lead to potential health, safety, and environmental benefits. In this case the impact is longer term, greater in extent, intense in its effect and highly likely to occur. The effects of the impact may affect the broader environment.
+ [13 - 16 points]	POSITIVE VERY HIGH	These are permanent and important beneficial impacts which may arise. Individually or combined, these pose a significantly high positive impact on the environment. These impacts pose a very high benefit to the quality of the receiving environment and health, and may lead to potential health, safety, and environmental benefits. In this case the impact is long term, greater in extent, intense in its effect and highly likely or definite to occur. The effects of the impact may affect the broader environment.

5.7.4. THE MITIGATION HIERARCHY

The suitability and feasibility of all proposed mitigation measures will be included in the assessment of significant impacts. This will be achieved through the comparison of the significance of the impact before and after the proposed mitigation measure is implemented. Mitigation measures identified as necessary will be included in an EMPr.

An important aspect of impact assessment is the identification and application of methods which mitigate against the impacts. To aid selection of mitigation measures, the mitigation hierarchy is used. The mitigation hierarchy is a tool that guides users toward limiting as far as possible the negative impacts on biodiversity from development projects.

It emphasises best practice of avoiding and minimising any negative impacts, and then restoring [rehabilitating] sites no longer used by a project, before lastly considering off-setting residual impacts. The mitigation hierarchy is crucial for all development projects aiming to achieve no overall negative impact on biodiversity or on balance a net gain [also referred to a No Net Loss and the Net Positive Approach]. It is based on a series of essential, sequential steps that must be taken throughout the project's life cycle to limit any negative impacts on biodiversity.

A recent cross-sector guide for implementing the Mitigation Hierarchy provides practical guidance, innovative approaches and examples to Mitigation Hierarchy support operationalizing the mitigation hierarchy effectively. The publication is aimed at environmental professionals working in, or with, extractive industries and financial institutions, who are responsible for overseeing the application of the mitigation hierarchy to biodiversity conservation, while balancing conservation needs with development priorities.

The sequential steps of the mitigation hierarchy are annotated on the diagram below.



Figure 11: the mitigation hierarchy

5.7.5. IMPACT ASSESSMENT

This section presents the impact assessment according to the methodology in the preceding sections, in a tabular form.

Table 13: planning phase impact assessment –Water Supply Phase 2 Sampofu

No.	Impact	Alternative	Mitigation	Significance = E+D+I+P	Interpretation
Phase: Planning and Design – Construction of Water Supply Phase 2 Sampofu					
Sub-phase: Direct Impacts					
1	Inadequate or incompetent Planning and Design for the Low-cost houses [taking into consideration the best environmental solutions which can be accommodated by the budget assigned]	1	Without	-8	Negative low
			With	-6	Negative moderate
<p>Mitigation: [a] Ensure best practicable solutions of design which is best suited to the study area and receiving environment which will then result in the provision of infrastructure for the use of people in the surrounding communities. [b] Consideration must still be given to design which will minimize the need for maintenance and costs associated with that. [c] Ensure correct, peer and supervisor reviewed designs are developed. Furthermore, it is paramount that the findings of this BAR and the associated specialist studies are incorporated into the design to avoid sensitive area.</p>					
2	Consideration for national, provincial, and local plans and design standards in the planning for the development	1	Without	-7	Negative Moderate
			With	10	Positive High
<p>Mitigation: [a] All relevant plans for the area must be considered and adequate consultation with the relevant planning officials in the area. Design standards include but not limited to: The Engineering services will be designed to conform to Municipality Guidelines and Specifications and Other accepted services guidelines, standards, and specifications to ensure ease of maintenance and operation.</p>					
3	Development in sensitive habitats could lead to the diminishing of the socio-economic benefits.	1	Without	-7	Negative Moderate
			With	10	Positive high
<p>Mitigation: [a] All measures and considerations for the design of the proposed low-cost houses must be considered and optimization of social, economic, environmental, and practical benefits ensured. Socio-economic benefits will be enhanced. [b] Findings of the Basic Assessment Report and Associated specialist studies must influence orientation of the proposed structure and construction site camp in relation to sensitive areas. [c] All sensitive areas must be demarcated as No-Go areas; entry into these areas must be prohibited.</p>					
4	Appropriate planning of exclusion of sensitive vegetation and steep areas.	1	Without	-11	Negative high
			With	-5	Negative low
<p>Mitigation: [a] Avoidance of the areas with severe degradation in the area. [b] No-go areas must be clearly marked off. [c] Use of existing road is recommended to avoid unnecessary clearance and disturbance to natural areas. [d] Disturbed areas must be rehabilitated immediately after construction. [e] Site layout plan must be developed for approval by the engineer and the ECO. [f] Encroachment into No-Go areas must be inspected, and corrective action implemented immediately.</p>					

5	Possible lack of consideration of what the environment can accommodate.	1	Without	-10	Negative high
			With	-6	Negative low
Mitigation: [a] All measures and considerations for the design of the houses and associated infrastructures must consider the triple bottom line and ensure optimization of social, economic, environmental, and practical benefits. [b] It is recommended that the proposed houses be founded on engineered rock fill. [c] Findings of the geotechnical assessment must influence the choice of technology alternatives.					
6	Unstable design which will require maintenance soon	1	Without	-8	Negative Moderate
			With	-5	Negative low
Mitigation: [a] Ensure that the best practicable design is used.					
7	Material shortages and poor management Practices. Impacts: [a] Design change due to material shortage [b] Poor resource allocation and allocation of tasks to incompetent personnel.	1	Without	-7	Negative moderate
			With	-4	Negative low
Mitigation: [a] Ensure timeous consultation and sourcing of material from local and international suppliers. [b] Ensure correct allocation or positioning of competent project team members. [c] The contractor must explore as many technology/ design alternatives as possible during the design phase of the project to avoid design change due to material shortage or poor management practices.					
Sub-phase: Indirect Impacts					
8	Increased hardened surfaces within the watercourse will result to increased surface water runoff	1	Without	-8	Negative Moderate
			With	-4	Negative low
Mitigation: [a] Under no circumstances must the structures be placed higher than the ground surface thereby creating a drop off that may cause erosion.					
Sub-phase: Cumulative Impacts					
9	Cumulative Impacts	1	Without	-10	Negative High
			With	-6	Negative low
<p>Cumulative impacts in relation to an activity, means the past, current, and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities.</p> <p>The impacts of the proposed development may not be significant or be a serious threat to the environment but many projects in one area or occurring in the same vegetation type may have significant impacts (DEAT, 2004).</p> <p>Even though the possible extent of the cumulative impacts cannot be determined due to not knowing the number of projects that will be accepted, it is still important to try and identify the negative and positive impacts which may arise, and this includes looking at this project in conjunction with other projects in the area. There is livestock grazing near the proposed project site, this places the watercourse at risk of pollution from animal faeces. This impact coupled with improper waste management activities and hydrocarbons leakage could result to contamination of the watercourse.</p>					

Mitigation: [a] Refuse bins with lids must be provided and emptied as and when required. [b] Chemical toilets must not be placed within 32 meters from the watercourse. [c] No refueling of machinery or vehicles on site. [d] Concrete mixing must not be done close to the watercourse and concrete must be mixed on impermeable surfaces. [e] Layout of the construction site camp must be influenced by findings of this BAR and associated specialist studies to avoid placement of any structure in sensitive areas.		
Average without mitigation	-8.4	Negative Moderate
Average with mitigation	-1	Neutral

Table 14: planning phase impact assessment – no-go

No.	Impact	Alternative	Mitigation	Significance = E+D+I+P	Interpretation
Phase: Planning and Design - No-go					
1	The status quo would remain, and the short-term impacts will not occur Mitigation: N/A	1	N/A	10	Positive high
2	Maintaining the status quo would also mean that the provincial and local departments will not be able to plan for socio-economic opportunities. Mitigation: The development should be planned for to ensure economic growth.	1	N/A	-12	Negative high
3	Road users will continue making use of rock outcrops in the riverbed as a crossing point. In times of rain this crossing is submerged and unsafe to use. Mitigation: [a] The development should be planned carefully to ensure that safety is addressed adequately.	1	Without	-12	Negative high
Average without mitigation				-4.67	Negative Low
Average with mitigation				0.0	Neutral

Table 15: construction phase impacts – Construction of Water Supply Phase 2 Sampofu

No.	Impact	Alternative	Mitigation	Significance = E+D+I+P	Interpretation
Phase: Construction of Water Supply Phase 2 Sampofu					
Sub-phase: Direct Impacts					

1	Loss of vegetation communities	1	Without	-9	Negative Moderate
			With	-6	Negative Low
<p>Mitigation: The scope of works does not entail clearance of vegetation. The working strip required for the construction of the houses must be effectively monitored to prevent vegetation removal.</p> <p>[a] Vegetation clearing, and trampling must be avoided; [b] Existing roads must be used where feasible [c] Alien vegetation is likely to invade in areas where biological disturbance took place, the area should be actively managed to prevent the growth of alien invasive species. [c] Disturbed areas must be rehabilitated immediately after construction.</p>					
2	Soil stripping and excavation: Impacts involve compaction of the soil and loss of topsoil. Topsoil contains most organic matter and decomposed organisms and nutrients; thus, the removal of the topsoil constitutes a major loss in terms of ecosystem function.	1	Without	-10	Negative high
			With	-4	Negative low
<p>Mitigation: [a] Excavated areas should be demarcated and must not remain open for extended periods; this will warn the public of the inherent dangers and enhance safety for road users and livestock grazing near the site. [b] Topsoil must not be stockpiled for an extensive period (> 3 months). This is to prevent the redundancy of the existing seed bank as well as the alteration of the soil characteristics (permeability, bulk density etc.). [c] Should any artefacts of archaeological significance be exposed during excavation, work on the area where the artefacts were found, shall cease immediately and the ECO shall be notified as soon as possible. Upon receipt of such notification, the ECO will arrange for the unearthed artefact to be examined by qualified personnel and or relevant provincial authority. [d] Under no circumstances shall archaeological artefacts be removed, destroyed, or interfered. [e] Topsoil must be separated from subsoil and topsoil must be preserved for use during rehabilitation phase.</p>					
3	Negative ecological impacts on the aquatic environment, wetlands, and associated biodiversity of the watercourse during construction work. Impacts involve altering the characteristics of the watercourse consequently impacting aquatic life present therein.	1	Without	-13	Negative very high
			With	-5	Negative low
<p>Mitigation: [a] Restricting all construction activities to the construction area; this mitigation measure will minimize damage to watercourse. If the impact occurs corrective actions as per the EMP are to be implemented to ensure that the occurrence ceases. [b] No harvesting of riparian vegetation and any other vegetation near the proposed site. [c] Biodiversity of the watercourse should be protected, animal killing for any purpose is impermissible. [d] Mixing of concrete should not be undertaken on bare grounds and concrete remains should be cleared immediately. [e]</p>					

	Refueling of machinery used on site should not be done near the watercourse. [d] Cleaning of material used during construction must not be undertaken on sites.				
4	Hydrocarbons – leakages from petrol/diesel stores and machinery/vehicles, spillages from poor dispensing practices. Oils and grease - leakages from oil/grease stores and machinery/vehicles, spillages from poor handling and disposal practices. These can cause negative ecological impacts to the natural vegetation near the proposed site and riparian.	1	Without	-10	Negative High
			With	-5	Negative low
	Mitigation: The following measures should be implemented in conjunction with the generic pollution prevention measures provided in the Construction EMP: [a] Hazardous storage and refueling areas must be bunded prior to their use on site during the construction period following the appropriate SANS codes. [b] The bund wall should be high enough to contain at least 110% of any stored volume. [c] The surface of the bunded surface should be graded to the center so that spillage may be collected and satisfactorily disposed of. [d] The proper storage and handling of hazardous substances [e.g., Fuel, oil, cement, bitumen, paint, etc.] needs to be administered. [e] Storage containers must be regularly inspected to prevent leaks. [f] Mixing and/or decanting of all chemicals and hazardous substances must take place on a tray, shutter boards or on an impermeable surface and must be protected from the ingress and egress of stormwater.				
	[f] Staff environmental induction must take place prior to construction commencing and any subcontractors utilized must be inducted before starting work onsite. [g] All contractor employees must receive basic environmental awareness training and shall be educated on the requirements of the EMP. [h] The environmental induction training is the responsibility of the project manager and the contractor and should be undertaken by the EO or a suitably qualified person. [i] The ECO must oversee and monitor the induction training to ensure that the training is sufficient, and that adequate training is provided prior to construction commencing. [j] All staff involved in work within the freshwater habitats must receive specific inductions related to the detailed methods statements. [k] All managers, contractors, laborer, and personnel involved during the project are to be familiarized with the method statement. [l] It is vital that all personnel are adequately trained to perform their designated tasks to the accepted standards. [m] The ECO must monitor the compliance of the contractors and instruct the Contractors where necessary. [n] The ECO may request that the Project Manager suspend part or all the works if the Contractors repeatedly cause damage to the environment. [o] The suspension should be enforced until such time as the offending actions, procedure or equipment is corrected and the environmental damage repaired. [p] A copy of the method statement will always need to be made available at the construction site offices/site camp.				
[q] Drip trays should be utilized at all dispensing areas and must be placed under all stationary machinery and or vehicles. [r] No refueling, servicing nor chemical storage should occur within 50 m of the delineated wetland/aquatic habitat or within the 100-year flood line, whichever is applicable. [s] No vehicles transporting concrete, asphalt or any other bituminous product may be washed on site. [t] Vehicle maintenance should not take place on site unless a specific bunded area is constructed for such a purpose. [u] Ensure that transport, storage, handling, and disposal of hazardous substances is adequately controlled and managed. [v] Correct emergency procedures and cleaning up operations should be implemented in the event of accidental spillage. [w] If a water pump is required, the water pump must operate inside or on top of a drip tray to prevent any spillage					

	<p>of fuel and limit the risk of soil/water contamination. [x] The drip tray will need to be lined with absorbent pads and checked daily while in use. [y] All equipment to be used within the sensitive working areas [within the channel] must be checked daily for oil and diesel leaks before gaining access to these working areas. [z] An emergency spill response procedure must be formulated, and staff are to be trained in spill response. [aa] All necessary equipment for dealing with spills of fuels/chemicals must be available at the site. [ab] Spills must be cleaned up immediately and contaminated soil/material disposed of appropriately at a registered site. [ac] 44-gallon drums must be kept on site to collect contaminated soil. [ad] These should be disposed of at a registered hazardous waste site. [ae] Fire prevention facilities must be present at all hazardous storage facilities. [af] The Material Safety Data Sheet (MSDS) for all hazardous substance, including hydrocarbon, shall be kept on site. Procedures detailed in the MSDS shall be followed in the event of an emergency. [ag] All hazardous chemical substance waste must be disposed of in accordance with the Hazardous Chemical Substances Regulations, 1995 (Regulation 15). [ah] The waste, resulting from the use of hazardous materials, shall be collected by a licenced hazardous waste service provider for disposal at a registered hazardous waste management facility.</p>				
5	Alien plant invasion because of biological disturbance. Impact includes reduced habitat quality and irreparable damage to the ecosystem	1	Without	-8	Negative Moderate
			With	-4	Negative low
<p>Mitigation: [a] Prevention of damage or disturbance to the natural environment; [b]Removal of alien plant invaders which are present in the area, prior to construction [c] Areas with alien vegetation which have not been removed during the construction should be cleared and rehabilitated. This will improve the status of these areas and prevent the introduction of alien invasive species in the area. [d] Ongoing monitoring of the project site for inspection of alien plan invasion, eradication of these species should be done as an when required to prevent the spread.</p>					
6	Nuisance caused by Dust and Air pollution during construction of the road	1	Without	-8	Negative moderate
			With	-4	Negative low
<p>Mitigation: [a] Dust is likely to be generated during construction phase, frequent and effective dust-suppression is advised [b] Dust must be suppressed on the construction site during dry periods by the regular application of water. [c] Water used for this purpose must be used in quantities that will not result to ponding and runoff. [d] Active work areas, stockpiles and loads of soil being transported must be watered to reduce dust. [e] Measure must be taken to immediately mitigate a situation in which excessive fugitive dust is observed. Works being undertaken must be undertaken with caution, or phase down while the source is being actively investigated and suppression measures be implemented. [f] Disturbed soils, slopes and areas of open excavation must be minimised to avoid wind erosion. [g] Limit the height of stockpiles. [h] Diesel exhaust emissions from heavy machinery on site (excavators, front end loaders and hauling trucks) must be controlled and minimised by regular checks and servicing of vehicles. [i] Any construction vehicle found to be emitting excessive smoke should be stopped from the operations for some mechanical attention before it could continue.</p>					
7	Concrete mixing, pouring and disposal practices.	1	Without	-12	Negative high

			With	-6	Negative low
	<p>Mitigation: [a] Cement/concrete batching is to be in an area to be hardened and must first be approved by the ECO. [b] No batching activities shall occur directly on the ground. [c] The land surface to be protected from the negative impact that may arise due to concrete mixing activities. [d] Concrete pouring activity to be done in such a way that concrete spillages are avoided. If concrete spills occur, the affected areas must be rehabilitated immediately. [e] Cleaning of concrete mixer chutes only to be done in such way that it does not cause pollution or concrete spillages on to the ground. [f] Concrete remains should be cleared and disposed of appropriately.</p>				
	Negative ecological impacts on watercourses and wetlands and associated biodiversity in the study area due to illegal dumping of waste material. Impacts involve physical damage to watercourse and wetland habitats and the mortality of aquatic, wetland and terrestrial plants and animals and impact the aesthetics of the natural environment.	1	Without	-10	Negative High
			With	-5	Negative low
8	<p>Mitigation: [a] Eating areas must not be located near wetlands/riparian habitats. [b] Provide adequate rubbish bins and waste disposal facilities on-site and educate/encourage workers not to litter or dispose of solid waste in the natural environment but to use available facilities for waste disposal. [c] Clear and completely remove from site all general waste, constructional plant, equipment, surplus rock, and other foreign materials once construction has been completed. [d] Recycling/re-use of waste is to be encouraged. [e] Litter generated by the construction crew must be collected in rubbish bins and disposed of weekly at registered sites by a registered waste management company. [f] No litter, refuse, wastes, rubbish, rubble, debris, and builder's wastes generated on the premises must be placed, dumped, or deposited on adjacent/surrounding properties during or after the construction period, but disposed of at an approved dumping site. [g] The construction site must be kept clean, tidy, and free from rubbish. [h] Provide adequate rubbish bins and waste disposal facilities on-site and educate/encourage workers not to litter or dispose of solid waste in the natural environment but to use available facilities for waste disposal. Litter bins must be equipped with a closing mechanism to prevent their contents from blowing out or animals from accessing the contents. [i] Clear and completely remove from site all general waste, constructional plant, equipment, surplus rock, and other foreign materials once construction has been completed. No litter, refuse, wastes, rubbish, rubble, debris, and builders waste must be placed, dumped, or deposited on adjacent/surrounding properties during or after the construction period. [j] The construction site must be kept clean and tidy and free from rubbish. Empty litter bins weekly [or as required before they reach capacity]. [k] Recycling/re-use of waste is to be encouraged. [k] No solid waste may be burned on site. [k] No building material, soils or rubble is to be disposed of within or close to any watercourse, including rivers, streams, and riparian habitats. [l] No burning of waste is allowed on site.</p>				
9	Negative ecological impacts on vegetation and associated biodiversity near the proposed site due to invasion by alien plant species resulting from damaged and disturbed habitat near the project area	1	Without	-10	Negative high
			With	-5	Negative low

	Mitigation: [a] Restricting all construction activities to the construction area; removing alien plant invaders which are present in the vicinity of the construction area; checking the area regularly for new growth of alien plant invaders during the construction and once the proposed project is completed. [b] An on-going monitoring programme must be implemented. This monitoring plan can be incorporated into the routine inspection activities. [c] No weeds to grow in disturbed (rehabilitated) soils. [d] No herbicides to be used on aliens, manual removal is recommended.				
10	All road users are at risk during the construction phase due to exposure to heavy duty vehicles and increased traffic.	1	Without	-7	Negative Moderate
			With	-4	Negative low
	Mitigation: [a] Social responsibility by the construction staff must be always ensured. [b] A safety officer must be delegated specific safety management tasks and the CLO must maintain a regularly open channel of communication with the surrounding homesteads. [c] Furthermore, all applicable safety regulations must be adhered to and clear signage in a local language erected. [d] In areas of open excavation, signage restricting movement is advised and the area must be clearly demarcated. [e] The project sites are currently of use by the public, it is therefore recommended that residents be informed of use of alternative routes during construction phase and safety of road users must be ensured through barricading of excavations and implementation of other safety measures.				
11	All free roaming livestock are at risk during the construction phase due to exposure to heavy duty vehicles, increased traffic, and open excavations.	1	Without	-9	Negative Moderate
			With	-4	Negative low
	Mitigation: [a] Due care must be taken to protect animals from construction hazards. [b] No animals are to be harmed, snared, or caught and killed. [c] Excavations should not be left open for excessive periods. [d] open excavation should be barricaded using nets high enough to prevent entry of roaming livestock.				
12	Noise pollution caused by construction activities and machinery	1	Without	-8	Negative Moderate
			With	-4	Negative low
	Mitigation: [a] Surrounding communities and adjacent landowners are to be notified upfront of noisy construction activities. [b] Provide all equipment with standard silencers. [c] Maintain silencer units on vehicles and equipment in good working order. [d] Construction staff working in areas where the 8-hour ambient noise levels exceed 60 dBA should wear ear protection equipment; [e] Select vehicle routes carefully at selected intervals to avoid excessive disturbances to the surrounding community; [d] Construction activities must abide by the national noise laws and the municipal noise by-laws regarding the abatement of noise caused by mechanical equipment. In the absence of bylaws, national regulations on noise control must be complied with; [f] Ensure that the construction vehicles are under the control of competent personnel.				
13	Potential for fires	1	Without	-7	Negative moderate

			With	-4	Negative low
	<p>Mitigation: [a] No open fires to be permitted within the construction footprint. [b] Ensure that no refuse waste is burnt on the site or on surrounding premises. [c] Ensure that all workers on site are aware of the proper procedure in case of a fire occurring on-site. [d] Ensure adequate fire-fighting equipment is available and train workers on how to use it. [e] The statutory requirements of provincial ordinances, municipal by-laws and the National Veld and Forest Fire Act, 1998 [Act No. 101 of 1998] must be complied with. [f] Firefighting equipment to be placed at strategic areas relevant to the points where cooking fires are allowed. [g] A firebreak must be created in high-risk areas such as camp sites and material storage areas.</p>				
14	If runoff and erosion control measure are not effectively implemented by the contractors, erosion rills and gullies may form along the cleared and exposed soils within the construction footprint and lead to increased rates of erosion and sedimentation.	1	Without	-9	Negative Moderate
			With	-5	Negative low
	<p>Mitigation: [a] Unnecessary clearing of vegetation resulting in exposed soil prone to erosive conditions to be avoided. [b] Trees or existing grass strata outside of the construction corridor must not to be removed as they will reduce the destructive force of water which can cause erosion. [c] Indigenous vegetation that does not interfere with the construction activities, to be left undisturbed. [d] All cleared areas must be ripped and rehabilitated after construction. [e] The top 200mm layer of topsoil must be removed and stockpiled in small heaps and replaced on the construction areas once the activities have been completed. [f] The affected areas must be vegetated with a grass mixture indigenous to the area. [g] The eradication of any alien vegetation to be followed by replacement with indigenous vegetation as soon as possible to ensure quick and sufficient coverage of exposed soil.</p>				
Sub-phase: Indirect Impacts					
15	Health and safety	1	Without	-6	Negative low
			With	-4	Negative low
	<p>Mitigation: [a] The Contractor shall comply with all standard and legally required health and safety regulations as promulgated under the Occupational Health and Safety Act and associated regulations. [b] Programs raising awareness on COVID-19 should be undertaken [c] Number of laborers should be kept to a minimum where possible. [d] All personnel coming to site must be cleared of Flu-like symptoms. [e] Temperature screening to be done on site and upon arrival of each personnel. [f] Attendance registers for all coming to site or site office including vehicle details should be always kept. [g] Personal Protective Equipment to be supplied to all employees and should be always worn. [h] Work tools such as spades and other hand-held tools should be cleaned after every use. [i] No cluster of people working closed together should be allowed. [j] Official training in the correct fit, use, care, storage, and limitations of all Personal Protective Clothing, Respiratory and Hearing Equipment must be given to the employees.</p>				

16	Due to an increased worker population and potentially non-locals in the area, there may be incidents of increased crime, violence [domestic], and security incidents.	1	Without	-6	Negative low
			With	-4	Negative low
Mitigation: [a] To as great an extent as possible, local labor must be sourced. [b] The CLO must be regularly engaged, and the community must be encouraged to work together to limit any possible crime.					
Sub-phase: Cumulative Impacts					
17	<p>Cumulative impacts in relation to an activity, means the past, current, and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities.</p> <p>The impacts of the proposed development may not be significant or be a serious threat to the environment but many projects in one area or occurring in the same vegetation type may have significant impacts (DEAT, 2004).</p> <p>Even though the possible extent of the cumulative impacts cannot be determined due to not knowing the number of projects that will be accepted, it is still important to try and identify the negative and positive impacts which may arise, and this includes looking at this project in conjunction with other projects in the area.</p> <p>Currently, there are no developments being undertaken on the proposed site or near the proposed site. Based on the findings of the site investigations, there seems to be no evidence of detrimental impacts attributed to the previous developments that occurred on site. There are animals grazing near the project site, watercourse is at risk of contamination by animal faeces; this coupled with improper waste management practices and leakage of hydrocarbons to the watercourse could result to significant pollution of the watercourse.</p>	1	Without	-10	Negative high
			With	-6	Negative low
Mitigation: [a] Mixing of concrete should not be done near the watercourse [b] Refueling of machinery and vehicles should not be undertaken on site. [c] Tools should not be washed near the watercourse. [d] Bins with lids should be provided and emptied as and when required.					
Average for construction of Low-cost Houses without mitigation				-8.9	Negative moderate
Average for construction of Low-cost Houses with mitigation				-4.6	Negative low

Table 16: construction phase impact assessment – no-go

No.	Impact	Alternative	Mitigation	Significance = E+D+I+P	Interpretation
Phase: Construction - No-go					
1	The status quo would remain, and the short-term impacts will not occur	1	N/A	12	Positive high
	Mitigation: N/A				
2	Maintaining the status quo would also mean that the provincial and local departments will not be able to plan for socio-economic opportunities.	1	N/A	-13	Negative very high
	Mitigation: The development should be planned for ensure economic growth.				
3	Conditions that threaten safety of road users will remain.	1	Without	-13	Negative very high
	Mitigation: The development should be planned carefully to ensure that safety is addressed adequately.				
Average without mitigation				-4.6	Negative Low
Average with mitigation				0.0	Neutral

Table 17: Construction Socio-economic impacts

No.	Impact	Alternative	Mitigation	Significance = E+D+I+P	Interpretation
Phase: Construction – Socioeconomic impacts					
1	Employment opportunities	1	Without	6	Positive low
			With	10	Positive high
	Mitigation: [a] Employment should be managed by selecting suitable employees according to a selection system that ensures transparent recruitment from local and impacted communities. This will ensure a fair recruitment process. [b] Human Resources policies and procedures should be developed and implemented to ensure that recruitment is done in a fair and transparent way, and that employment opportunities are maximised. [c] Attention should be paid to employment opportunities for women and disabled persons. [e] Local employment opportunities should be maximised, with appropriate skill transfers for outside or migrant workers to pass those skills onto local workers.				
2	Local economic development	1	Without	6	Positive low

		With	12	Positive High
Mitigation: [a] Business opportunities should be advertised for the community members to be informed about opportunities in the area.				
Average without mitigation			6	Positive Low
Average with mitigation			11	Positive high

Table 18: Construction Socio-economic: NO-GO

No.	Impact	Alternative	Mitigation	Significance = E+D+I+P	Interpretation
Phase: Construction – No-go					
1	The status quo would remain with no resultant employment opportunities.	1	N/A	-6	Negative low
Mitigation: N/A					
2	The status quo would remain with no resultant business opportunities.	1	N/A	-6	Negative low
Mitigation: The development should be planned for to ensure economic growth.					
Average				-6	Negative Low

Table 19: operation phase impact assessment

No.	Impact	Alternative	Mitigation	Significance = E+D+I+P	Interpretation
Phase: Operational – Water Supply Phase 2 Sampofu					
Sub-phase: Direct Impacts					
1	Degradation, loss, and fragmentation of habitat with regards to the secondary effects of vegetation disturbance, including but not limited to erosion risk and encroachment/colonization of terrestrial habitats by Invasive Alien Plants. Possible ecological consequences associated with this impact may include: [a] Reduction in representation and conservation of vegetation types/communities;	1	Without	-9	Negative moderate

	[b] Reduction/loss of habitat for fauna; and [c] Reduction in and/or loss of species of conservation concern [i.e., rare, threatened/endangered species.		With	-4	Negative low
Mitigation: [a] Removal of vegetation must be kept to a minimum. [b] Environmental awareness training must be undertaken by a competent ECO when construction commences [c] Machinery must be operated with responsibility.					
2	Increased hardened surfaces within the watercourse will result to increased surface water runoff but more significantly, it will result in increased runoff velocities at discharge points that will become areas at risk from erosion	1	Without	-8	Negative moderate
			With	-5	Negative low
Mitigation: [a] Outlet erosion protection structures must be designed to reduce outflows to energy levels that do not pose an erosion risk to downslope soils. [b] Outlet erosion structures must be properly installed along grade and elevation of the slope. [c] Under no circumstances must the structures be placed higher than the ground surface thereby creating a drop off that may cause erosion.					
4	Pollution of soil, water, and vegetation This refers to the alteration or deterioration in the physical, chemical, and biological characteristics of water, soil, and air resources which inevitable impacts on vegetation.	1	Without	-8	Negative moderate
			With	-4	Negative low
Enhancement: [a] The infrastructure must be maintained responsibly by the local authority to mitigate against littering and pollution which could lead to prolonged pollution.					
5	Impacted communities will have continued access to facilities to which their access was limited by weather conditions. Implementation of the project will result to mushroomed development due to increased mobility or accessibility.	1	Without	11	Positive high
			With	15	Positive very high
Enhancement: [a] Overall the development will lead to beneficial impacts for the indigent area.					
Sub-phase: Indirect Impacts					
6	Impact to indigenous vegetation- Activities involving the clearing/harvesting of natural vegetation could result in the destruction or loss of plants and animal species of conservation significance.	1	Without	-8	Negative moderate
			With	-4	Negative low
Mitigation: [a] No clearing of vegetation and harvesting should be allowed within the construction footprint and within 500m radius of the proposed site. [b] No animals are to be harmed, snared, or caught and killed. [c] Use of existing roads is recommended as this will avoid fragmentation of					

natural habitats and consequently habitat loss. [d] Construction of temporary access roads should be avoided to limit unnecessary clearance of natural vegetation.		
	Average without mitigation	-1.7
	Average with mitigation	2
		Negative low
		Positive low

Table 20: Operational Phase - NO-GO

No.	Impact	Alternative	Mitigation	Significance = E+D+I+P	Interpretation
Phase: Operational - No-go					
1	The status quo would remain, and the short-term impacts will not occur	1	N/A	12	Positive high
	Mitigation: N/A				
2	Maintaining the status quo would also mean that the provincial and local departments will not be able to plan for socio-economic opportunities.	1	N/A	-12	Negative high
	Mitigation: The development should be planned for ensure economic growth.				
3	The condition that threatens safety of road users during appreciable rainfall events will remain.	1	Without	-12	Negative high
	Mitigation: The development should be planned carefully to ensure that safety is addressed adequately.				
			Average without mitigation	-4.0	Negative Low
			Average with mitigation	0.0	Neutral

Table 21: Decommissioning phase impact assessment – all aspects

No.	Impact	Alternative	Mitigation	Significance = E+D+I+P	Interpretation
Phase: Decommissioning					
Not Applicable					

6. STUDY FINDINGS AND CONCLUSIONS

6.7. ENVIRONMENTAL IMPACT STATEMENT

6.1.1. INTRODUCTION

Potential environmental impacts [biophysical and social] associated with the Proposed construction of Water Supply Phase 2, Sampofu has been identified herein. This BA assesses and addresses all potentially significant environmental issues to provide KZN DEDTEA with sufficient information to make an informed decision regarding the proposed project.

Table 22: Summary of Impacts

Impact	Significance without mitigation	Significance with mitigation
Watercourse ecology	Medium	Low -
fauna and flora	Low-Medium	Low -
Noise and air quality	Low	Low -
Waste management	Low-Medium	Low -
Heritage	Low	Low -
Soil and erosion	Low-Medium	Low -
Socio-economic safety and security	Low	Medium +

6.1.2. KEY FINDINGS OF THE STUDY

Overall, the results of the BA process emerge as having a "**negative low**" environmental significance after mitigation. The socio-economic impacts are however strongly positive, in that the development will result in safe conditions for the receiving community.

6.1.3. KEY CONCLUSIONS AND RECOMMENDATIONS OF THE SPECIALIST STUDIES

6.1.3.1. TERRESTRIAL BIODIVERSITY IMPACT ASSESSMENT STUDY

Based on these findings of the field assessment, no faunal or floral Species of Conservation Concern (SCC) were observed. It was also confirmed that under the carefully application of mitigation techniques, and supervision of the Environmental Compliance Officer (ECO), the proposed upgrade should not cause permanent harm to, or significantly jeopardise any SCC populations. It is likely that certain impacted species may continue to use the same habitat just outside of the development footprint during construction, and then return to the same habitat post-construction without jeopardising any significant movement corridors.

During the botanical survey, one protected species was found along the proposed development footprint. Although this species is common locally, their protection under the provincial conservation ordinance will require permits to be in place before starting construction on site. It was recommended that the Applicant submit a permit application at least three (3) months prior to construction to legalise the safe removal and translocation of each individual plant to suitable habitat found outside of the development footprint, or PAOI.

Based on the assessment of the proposed development, all activities are likely to have a medium impact on the receiving environment prior to the application of mitigation techniques. Of the identified impacts, the potential for alien vegetation to proliferate and affect surrounding plant communities, as well as the permanent loss of protected plant species were identified as being the most significant impacts. However, if the Contractor successfully implements a plant rescue and translocation process prior to construction, as well as controls the growth and subsequent spread of alien invasive plant species, all impacts should be maintained as low throughout the project life cycle.

Given that only areas of proposed reservoirs and pump stations within the development boundary will be transformed, the impacts assessment ratings will be mostly Negative medium impact to Negative low impact from a specialist perspective. However, considering the sensitivity status of the footprint bioregion and the recommended mitigations are not implemented, the project will drastically have an overall Negative high impact which should be avoided by the applicant.

IMPORTANT RECOMMENDATIONS FOR THE CONSERVATION OF THE CURRENT VEGETATION STRUCTURE

- The proponent must be committed to a conservation approach of practice and the actual footprint of disturbance must be kept to a minimum.
- As much of the natural environment must be conserved, there should be minimal vegetation clearing.
- Relocation of important species, identification and demarcation of specimens and sub habitats not to be disturbed will have to be done beforehand by a specialist.
- Important species (flora) that will be threatened by the development must be relocated to safer habitats by suitable specialists.
- Preventative erosion control measures to be put in place.
- Conduct alien invasive species monitoring on an annual basis.

IMPORTANT RECOMMENDATIONS FOR CONSERVATION OF FAUNA SPECIES

- The proponent must be committed to a conservation approach of practice and the actual footprint of disturbance must be kept to a minimum.
- Relocation of important species, identification and demarcation of specimens and sub habitats not to be disturbed will have to be done beforehand by a specialist.
- Important species (fauna) that will be threatened by the development must be relocated to safer habitats by suitable specialists.
- Preventative erosion control measures to be put in place.

SPECIFIC CONDITIONS RECOMMENDED FOR THE EA FROM A BIODIVERSITY PERSPECTIVE.

- Implement mitigation controls during the construction phase as specified in the mitigation requirements. Monitor and report on their effectiveness.
- Implement mitigation controls during the operational phase as specified in the mitigation. Monitor and report on their effectiveness.
- Monitoring of implementation of mitigation controls, along with reporting, should be undertaken at least quarterly throughout the construction phase, and bi-annually during the operational phase. Monitoring, at the minimum, should consist of a quarterly monitoring of the development area.
- As much of the natural habitat as possible should be preserved during construction and operation to lessen the operational impacts and to reduce the irreversibility of impacts.
- Effective restoration of the natural habitats that were intact before the development should be implemented and reported on after decommissioning.

6.1.3.2. AQUATIC IMPACT ASSESSMENT

The proposed development is situated in a Very High Aquatic Biodiversity Sensitive Area. This is due to the presence of the Tugela River on the northern boundary of the development footprint. Due to the "highly sensitive" region being only on the northern boundary, and not the remainder of the development footprint, it can be concluded that, from an aquatic perspective, there is no objection for the proposed development and associated infrastructure to continue.

The overall impacts (including cumulative) for the project are Negatively low should the mitigation recommendations be effectively implemented. The placing and construction of reservoirs and pump stations would also require a licence from the Department of Water Affairs and Forestry as this activity

would fall under one of the specified water uses under Section 21 of the National Water Act: (i) altering the bed, banks, course, or characteristics of a watercourse.

Specific conditions recommended for the EA from an aquatic perspective:

- Implement mitigation controls during the construction phase as specified in the mitigation requirements. Monitor and report on their effectiveness.
- Implement mitigation controls during the operational phase as specified in the mitigation. Monitor and report on their effectiveness.
- Monitoring of implementation of mitigation controls, along with reporting, should be undertaken at least quarterly throughout the construction phase, and bi-annually during the operational phase. Monitoring, at the minimum, should consist of a quarterly monitoring of the development area for evidence of species displacement and habitat loss.
- Preserve as much of the natural habitat as possible during construction and operation to lessen the operational impacts and to reduce the irreversibility of impacts.
- Effective restoration of the natural habitats that were intact before the development should be implemented and reported on after decommissioning.

Important recommendations for nearby waterbodies:

The results of the present ecological state (PES) and the ecological importance and sensitivity (EIS) assessment for the river reaches considered in this assessment derived a moderately modified (Class C) ecological condition. This result provides an indication that the current activities within the river catchment area are negatively affecting the aquatic environment. The water resource has been changed from its natural state to being extremely impacted upon. Despite this, the sensitivity and importance of the aquatic biota are still considered high at a desktop scale.

For the proposed development to be granted, mitigation measures to restore the current state of the nearby wetland are urgently advised and abstractions should not exceed 5-10% of the current flow of the river system.

CONDITIONS TO BE INCLUDED IN THE ENVIRONMENTAL AUTHORISATION

- A plant search and rescue operation must be undertaken prior to the commencement of construction on site, and once the surveyor has pegged out the footprint.
- Any animal fatalities (intentional or accidental) must be reported to the ECO and an incident report compiled.

- Stormwater control measures must be put in place by the Contractor to prevent sediment from smothering nearby vegetation and entering the nearby riparian ecosystem outside of the development footprint.
- The appointed Contractor responsible for completing the development must be legally responsible for complying with the approved EMP and EA.
- The Contractor must include environmental topics within the toolbox talks at least once a month and should be made aware of the protected plant species and faunal species located nearby.
- A consolidated Alien Plant Species Plan and Rehabilitation Plan should be compiled to assist both the Contractor and Applicant in ensuring that no residual impacts take place, and that the positive impacts of the development are enhanced throughout the project Lifecycle.
- All natural habitats found outside the development footprint must remain untouched, and listed as a no-go area, unless for management and maintenance purposes (e.g., IAPS control) or accessing the site.
- No construction activities should take place during the evening unless authorised and monitored by the ECO.
- The Applicant should carefully manage herbicide usage for Alien Plant Species control. Where possible the use of herbicides should be avoided unless mechanical applications are no longer successful. Where usage is unavoidable, the Contractor must take into consideration, wind direction and speeds to avoid impact areas outside of the development footprint and herbicides, which are compatible with areas adjacent to sensitive habitat like wetland and rivers.

6.1.3.3. AGRICULTURAL COMPLIANCE STATEMENT

The agricultural impact of the proposed development is assessed as being acceptable because it results in negligible loss of future agricultural production potential. From an agricultural impact point of view, it is recommended that the development be approved. The protocol requirement of confirmation that all reasonable measures have been taken through micro-siting to avoid or minimise fragmentation and disturbance of agricultural activities, is not relevant in this case because of the minimal impact.

The conclusion of this assessment on the acceptability of the proposed development and the recommendation for its approval is not subject to any conditions other than recommended mitigation. In completing this statement, no assumptions have been made and there are no uncertainties or gaps in knowledge or data that are relevant to it. No further agricultural assessment of any kind is required for this application.

6.1.3.4. HERITAGE IMPACT ASSESSMENT

A heritage survey was undertaken for the proposed Sampofu Phase 2 water reticulation project. Previous surveys noted that there were many human graves and cemeteries in the general area. A total of sixty-one (61) graves and thirty-five (35) cemeteries were recorded, as well as one memorial and terracing for a settlement. Several of these graves and cemeteries occur within 20m of the pipeline footprint. The pipeline will need to be re-aligned in some of these instances pending on the size of the footprint. The final layout needs to be approved by the heritage practitioner to ensure graves are not affected. No further palaeontological mitigation is required.

The chance of fossils being found on the Sampofu Phase 2 Water Reticulation Pipeline site is Low, but not Zero. A "Chance Find Protocol" has been included to cover this eventuality. No further palaeontological work is required, unless triggered by the "Chance Find Protocol" in which a suitably qualified palaeontologist must be consulted. The "Chance Find Protocol" forms part of the Environmental Management Programme (EMPr) for the site.

It is the specialist's opinion therefore that the proposed development should receive a favourable outcome for the Environmental Application lodged with the Competent Authority (CA), provided that the conditions and mitigation techniques set out in this report are carefully implemented by the Applicant throughout the project Lifecycle. The specialist has not recommended any layout alternatives, as the current proposed layout makes use of transformed areas found within the existing waterworks facility.

6.1.4. EAP OPINION

This BAR provides an assessment of both the benefits and potential negative impacts anticipated because of the Proposed construction of Water Supply Phase 2, Sampofu. Based on the findings of environmental impact assessment, there is unlikely to be any significant negative environmental impacts and the socio-economic benefits are evident. Mitigation measures contained herein have been informed by the extent, nature, duration, and probability of impacts identified.

Implementation of mitigation measures and conditions of the Environmental Management Programme appended to this document which is intended for the management of the impacts of construction of the proposed project and operation thereof, will result to minimal impacts attributed to the proposed project. Assessment findings, therefore, present no fatal flaws; the development will have long term positive impacts than negative impacts, the latter of which are short termed.

The following recommendations / conditions, although not exhaustive, may be considered for inclusion in the environmental authorisation:

- An Environmental Control Officer (ECO) must be appointed to oversee those conditions of the Environmental Authorization are carried out properly.
- Preconstruction environmental awareness training must be provided to all construction staff on site.
- Construction footprint should be clearly demarcated; works outside the construction footprint is prohibited.
- All construction vehicles should adhere to clearly defined and demarcated roads.
- Dust suppression and erosion management should be an integrated component of the construction approach.
- No dumping of building waste or spoil material from the development should take place on areas other than a licenced landfill site or spoil site approved by the engineer.
- All hazardous materials should be stored appropriately to prevent contamination of the project site. Any accidental chemical, fuel and oil spills that occur at the project site should be cleaned up appropriately as related to the nature of the spill; significant spills to be reported to the relevant department.
- Weed control measures must be applied to eradicate the noxious weeds (category 1a & 1b species) on disturbed areas.
- Rehabilitation plan must be costed for in tender documents.
- Sensitive areas should be marked as no-go areas and entry to such areas should be prohibited.
- A plant search and rescue operation must be undertaken prior to the commencement of construction on site, and once the surveyor has pegged out the footprint.
- Any animal fatalities (intentional or accidental) must be reported to the ECO and an incident report compiled.
- Stormwater control measures must be put in place by the Contractor to prevent sediment from smothering nearby vegetation and entering the nearby riparian ecosystem outside of the development footprint.
- The appointed Contractor responsible for completing the development must be legally responsible for complying with the approved EMP and EA.
- The Contractor must include environmental topics within the toolbox talks at least once a month and should be made aware of the protected plant species and faunal species located nearby.
- A consolidated Alien Plant Species Plan and Rehabilitation Plan should be compiled to assist both the Contractor and Applicant in ensuring that no residual impacts take place, and that the positive impacts of the development are enhanced throughout the project Lifecycle.
- All natural habitats found outside the development footprint must remain untouched, and listed as a no-go area, unless for management and maintenance purposes (e.g., IAPS control) or accessing the site.

- No construction activities should take place during the evening unless authorised and monitored by the ECO.
- The Applicant should carefully manage herbicide usage for Alien Plant Species control. Where possible the use of herbicides should be avoided unless mechanical applications are no longer successful. Where usage is unavoidable, the Contractor must take into consideration, wind direction and speeds to avoid impact areas outside of the development footprint and herbicides, which are compatible with areas adjacent to sensitive habitat likes wetland and rivers.

It is the specialist's opinion therefore that the proposed development should receive a favourable outcome for the Environmental Application lodged with the Competent Authority (CA), provided that the conditions and mitigation techniques set out in this report are carefully implemented by the Applicant throughout the project Lifecycle. The specialist has not recommended any layout alternatives, as the current proposed layout makes use of transformed areas found within the existing infrastructure.

6.1.5. CONCLUSION

This study provided a quantified analysis of the impacts associated with the proposed development. The EAP is of the opinion that the project should be positively authorised, outlining the key findings of the study. The BA process and report complies with the EIA Regulations of 2014 [as amended in 2017], under which this project has applied and therefore meets all relevant requirements. The project is foreseen to have a “**negative low**” significance rating post application of mitigations proposed by the relevant specialists.

6.1.6. ASSUMPTIONS, GAPS AND LIMITATIONS OF THE STUDY

The BA process followed the legislated process required and as governed and specified by the EIA Regulations [2014 as amended in 2017]. Inevitably, when undertaking scientific studies, challenges and limitations are encountered. For this specific BA, the following challenges were encountered:

The information and recommendations contained herein are based upon information provided by the client and the assumption that all relevant information has been provided by all relevant sources consulted for requisition of such information. Furthermore, field investigation work has been restricted to a level of detail that satisfies the objectives of the study.

The document has been developed with due reference to the following:

- Site visits and assessments - Indaloenhle Environmental Consultants and CivTech Engineers (Pty) Ltd
- Information on biophysical environment – Indaloenhle Environmental Consultants
- Information on the proposed works – CivTech Engineers (Pty) Ltd

- Recommendations from the Authorities – Department of Economic Development, Tourism and Environmental Affairs.

6.1.7. RECOMMENDATIONS

6.1.7.1. RECOMMENDATIONS TO THE CA

It is the EAP's opinion that the application be assessed holistically, taking into consideration the study area and the fact that the development at the Proposed construction of Water Supply Phase 2 Sampofu. The impacts associated with the proposed developments are significantly low. There are no other layout and site alternatives recommended, as the current proposed layout makes use of transformed areas found within the existing infrastructure.

The project, in the EAP's opinion, does not pose a detrimental impact on the receiving environment and its inhabitants and can be mitigated to acceptable levels. Therefore, the proposed development should receive a favourable outcome for the Environmental Application lodged with the Competent Authority (CA), provided that the conditions and mitigation techniques set out in this report are carefully implemented by the Applicant throughout the project Lifecycle.

The Applicant should be bound to stringent conditions to maintain compliance and a responsible execution of the project. No post-construction monitoring is specified in this BA; however, it remains the duty of the Applicant to ensure the infrastructure is kept in sound condition.

6.1.7.2. RECOMMENDATIONS TO THE APPLICANT

The Applicant must adhere to the recommendations provided by the specialist and the EAP. The EMPr details these recommendations. The Applicant must take full responsibility for the execution of the project in a manner which does not negatively impact on the environment by ensuring that responsible decisions are made.

6.2. DECLARATIONS BY THE EAP

I, Divhani Mboyi Ramovha, declare that:

- I act as the independent environmental practitioner in this application.
- I do not have and will not have any vested interest (either business, financial, personal, or other) in the undertaking of the proposed activity, other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2014.
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant.
- I have expertise in conducting environmental impact assessments, including knowledge of the National Environmental Management Act (Act 107 of 1998), Environmental Impact Assessment regulations, 2014 (as amended) and any guidelines that have relevance to the proposed activity.
- I will comply with the Act, Regulations, and all other applicable legislation.
- I have no, and will not engage in, conflicting interests in the undertaking of the activity.
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan, or document to be prepared by myself for submission to the competent authority; all the particulars furnished by me in this report are true and correct.

Signature of the EAP:

Divhani M. Ramovha [EAP]