

FIRST DRAFT BASIC ASSESSMENT REPORT



**Draft Basic Assessment Report (DBAR) for the Proposed Mabibi Water Supply Scheme
Work Package 5 located within Ward 8 of the uMhlabuyalingana Local Municipality,
uMkhanyakude District Municipality, KZN**

A Project of the uMngeni-uThukela Water

November 2025

**THIS REPORT WAS COMPILED BY WALLACE AND GREEN (PTY) LTD. IN TERMS OF
APPENDIX 1 TO GNR 326 (AS AMENDED)**

2014 NEMA EIA Regulations (As amended 2017), Appendix 1- 3(a) a basic assessment report must contain the information that is necessary for the competent authority; (i) EAP who prepared the report and (ii) the expertise of the EAP, including curriculum vitae. 3 (1) (a) details of (i) the EAP who prepared the report; and (ii) the expertise of the EAP. Please see Appendix H for EAP Declaration and full Curriculum Vitae.

DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONERS

Table 1: Details of the Environmental Assessment Practitioner

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Experience	10 years

Table 3: Details of the Project Applicant

DETAILS OF THE PROJECT APPLICANT

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EXECUTIVE SUMMARY

Wallace and Green (Pty) Ltd., were appointed Ziyanda Consulting on behalf of uMngeni-uThukela Water to provide independent Environmental Consulting Services for the Proposed Mabibi Water Supply Scheme Work Package 5 within the uMhlabuyalingana Local Municipality, uMkhanyakude District Municipality, by conducting a Basic Assessment (BA) study in terms of the Environmental Impact Assessment (EIA) Regulations of 2014 (GNR 326 of December 2014 as amended), as promulgated under the National Environmental Management Act (NEMA) (Act No. 107 of 1998).

Project Description

uMngeni-uThukela water intends to implement the proposed Mabibi Water Supply Scheme in order to address the numerous water supply challenges being experienced under the uMhlabuyalingana Municipality areas of jurisdiction, thus uMngeni-uThukela water has sought funding from the Water Service Infrastructure Grant (WSIG) on behalf of uMkhanyakude District Municipality, the Water Services Authority and Water Service Providers for addressing the growing challenges of water supply.

The proposed infrastructure for the Mabibi Water Supply Scheme will include the following:

- A floating raw water abstraction work with two (2) pumps, where one (1) shall be utilised and the other will be on standby.
- Establishment of a 2000m 160mmØ bulk uPVC rising main from the abstraction point (Lake Sibayi) to the Mabibi Package Water Treatment Plant.
- The proposed Mabibi Packaged Water Treatment Plant (WTP) is sized to service a capacity of 1Ml/day.
- A 50kl elevated tank for the storage of clean water within the Mabibi WTP.

The proposed project falls within various properties associated with Ward 8 of the uMhlabuyalingana Local Municipality (LM). The site can be accessed via the Provincial Main Road R22 which falls within the town of Manguzi.

The abstraction of water to supply the Mabibi Package Plant will be sourced from the Lake Sibayi, which is considered as a Ramsar¹ site, an international birding area (IBA) and an area of unique biodiversity and ecological processes.

Lake Sibayi is the largest freshwater lake in Southern Africa and its resources are critical to the surrounding rural communities. While it used to be classified separately as an Important Bird Area (IBA) by Birdlife SA, it now forms part of the larger iSimangaliso Wetland Park which is IBA number SA128 in the IBA directory of Birdlife SA.

SAEON (South African Environmental Observation Network) has published reports indicating the reliance of Lake Sibayi on rainfall alone and the significant threat posed by the over-use of this water resource (due to both abstraction and water reduction activities such as agriculture and afforestation in the local aquifer). Drought has exacerbated the situation, and SAEON has indicated that Lake Sibayi may have a negative water budget with water levels continuing to drop.

Owing to the nature of comments made by the SAEON, it is thus important to note that the abstraction of water from the Lake Sibayi received Water Use Authorisation (WUA) from the Department of Water and Sanitation (DWS) on the 27th August 2024. The WUA authorised the allocation of 365 000 m³/a from Lake Sibayi to develop the Mabibi Package Plant Water Treatment Works as follows:

¹ Ramsar - Ramsar sites refer to sites listed on the List of Wetlands of International Importance, also known as the Ramsar List. These sites are designated because they meet the Criteria for identifying Wetlands of International Importance (Source: UNESCO World Heritage Convention, 2025).

- uMkhanyakude District Municipality currently has an allocation of 1 825 000 m³/a under registration number 21121910 to supply water for drinking to the same communities reflected in the application. The District Municipality has an additional allocation of 649 250 m³/a under registration number 21160066 and 21160084 from the same lake for other areas.
- Therefore, DWS indicated that Umngeni – Uthukela Water Water proceed with the construction of the Mabibi Package Plant Water Treatment Works and abstract water from Lake Sibayi as there is an existing allocation under uMkhanyakude District Municipality.

Based on the above, it is important to note that **NO** new allocation of water from the Lake Sibayi was allocated to the Mabibi Package Plant.

Alternatives

- **Design Alternatives:**

The following design alternatives were investigated for the Proposed establishment of the 2000m 160mmØ bulk uPVC rising main from the abstraction point (Lake Sibayi) to the Mabibi Package WTP:

- **Rising Main Option 1 (Preferred)** – The proposed establishment of the 2000m 160mmØ bulk uPVC rising main from the abstraction point (Lake Sibayi) to the Mabibi Package Water Treatment Plant. The route of the rising main will follow the existing D1848 gravel road, thus avoiding the wetland sensitive areas delineated on the site. The route was supported by the Wetland Specialist (2025), which scored the impacts a “Low” significance rating.
- **Rising Main Option 2 (Not Supported)** - The proposed establishment of the 2000m 160mmØ bulk uPVC rising main from the abstraction point (Lake Sibayi) to the Mabibi Package Water Treatment Plant. The route of the rising main intercepts the delineated wetland system at two sections.

- **Technology Alternatives:**

Three (3) technology alternatives were investigated for the Proposed abstraction of water to supply the Mabibi WTP:

- **Abstraction of 1ML/Day from the Lake Sibayi (Preferred)** –

The abstraction of water from the Lake Sibayi received Water Use Authorisation (WUA) from the Department of Water and Sanitation (DWS) on the 27th August 2024. The WUA authorised the allocation of 365 000 m³/a from Lake Sibayi to develop the Mabibi Package Plant Water Treatment Works as follows:

- uMkhanyakude District Municipality currently has an allocation of 1 825 000 m³/a under registration number 21121910 to supply water for drinking to the same communities reflected in the application. The District Municipality has an additional allocation of 649 250 m³/a under registration number 21160066 and 21160084 from the same lake for other areas.
- Therefore, DWS indicated that Umngeni – Uthukela Water Water proceed with the construction of the Mabibi Package Plant Water Treatment Works and abstract water from Lake Sibayi as there is an existing allocation under uMkhanyakude District Municipality.

It is also important to note that the abstraction of water from Lake Sibayi is a short-term intervention and will be discontinued once the supply from Jozini Dam reaches the Mabibi area.

A cost comparison between the planned long-term intervention of supplying the project area (Mabibi) from the Jozini Regional Water Supply Scheme and the short-term intervention of supply from Lake Sibayi are compared side by side in the table below.

Description	Short Term Intervention Lake Sibayi Water Supply	Long Term Intervention Jozini Water Supply Scheme
Bulk Infrastructure Cost (including VAT)	R26 438 816,25	R544 860 780,12

The cost estimate for the short-term intervention of supplying from Lake Sibayi is 4,9% of the cost estimate for the long-term intervention of supply from Jozini Dam. In view of the foregoing the short-term solution of abstracting from Lake Sibayi has been selected as recommended solution for the water supply challenges in the Mabibi area.

- **Abstraction from the Jozini Dam (Long-term Option) -**

uMkhanyakude District Municipality's (UKDM) Universal Access Plan Phase 3 proposes that the Mabibi area be supplied from Jozini Dam through the Jozini Regional Water Supply Scheme. The primary water source for the water supply scheme is Pongola Dam. Raw Water abstraction is currently at 37Ml/day and is earmarked to be upgraded to 80Ml/day in the future to accommodate other areas in Umhlabuyalingana LM and including the Mabibi area.

The infrastructure required will eventually deliver raw water supplies to the Mabibi area. According to UKDM, the implementation of the Jozini Regional Water Scheme has recently commenced with the first 10km of the 760mm diameter pipeline having been completed. Tenders for the balance of the 5,3km will be advertised the next financial year. The envisaged completion of the bulk conveyance infrastructure to deliver raw water supplies to Mabibi could be completed in the next 30 to 40 years. This will also depend largely on funding provisions and annual budget allocations for the project.

It is important to note that once the water supply reaches the Mabibi area, this abstraction method will be implemented.

- **Supply from Boreholes (Not Supported) -**

A borehole Yield Analysis was conducted by Terratest (2024). The assessment noted that the volumes drawn from the two (2) boreholes associated with the Mabibi area was very low compared to the water demand requirements. The yield is outlined in the table below.

The highest abstraction volume from the borehole investigation is 0,83l/s (72kl/day) compared to the demand for the Mabibi area of 150kl/day. The boreholes are thus not a sustainable water supply solution.

Item No	Area	Borehole No.	BOREHOLE DETAILS			
			Nearest Feature	Coordinates		Yield (l/s)
				Latitude	Longitude	
1	Mabibi Phase 1	TBA	Nera Tonga Beach Lodge	27° 19' 40.61"	32° 44' 36.55"	0,4
2	Mabibi (WTW)	KZN010018	Next to Proposed Mabibi WTW site	27° 19' 40.24"	32° 43' 36.31"	0,83

EIA Process

Based on the project activities and consultation with the National Department of Forestry, Fisheries and the Environment (DFFE), the proposed project will require Environmental Authorisation via a Basic Assessment Process due to the following listed activities in terms of the NEMA EIA Regulations 2014 (as amended):

- Activity 9 of Listing Notice 1 (GNR327) - The proposed Water Scheme will comprise of the following: Establishment of a 2000m 160mmØ bulk uPVC rising main from the abstraction point (Lake Sibayi) to the Mabibi Package Water Treatment Plant.
- Activity 12 of Listing Notice 1 (GNR327) - The proposed project will involve the establishment of a rising main with a physical footprint of approximately 13 580m² which occurs within 32m of a wetland system.
- Activity 12 of Listing Notice 3 (GNR325) – The total development footprint of the rising pipeline is 13 580m². More than 300 m² of vegetation will be cleared for the construction of infrastructure. The proposed development footprints are in the Coastal Forest Reserve in Isimangaliso Wetland Park. The Park has been declared a World Heritage Site and is a Protected area.
- Activity 14 of Listing Notice 3 (GNR 325) - The floating raw water abstraction works with a development footprint of 10.92m² will be located within Lake Sibayi. The development footprint of the raw water rising main from the abstraction works to Mabibi Package Water Treatment Plant is 13580m². The proposed infrastructure will be installed within a rural area. The proposed project is located within iSimangaliso Wetland Park, a World Heritage Site.

This BA follows the legislative process prescribed in the Environmental Impact Assessment (EIA) Regulations (2014). This report constitutes the First (1st) Draft Basic Assessment Report 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 Interested and Affected Parties' (I&APs) issues and concerns.

To protect the environment and ensure that the development is undertaken in an environmentally responsible manner, there are several significant portions of environmental legislation and specialist studies that were taken into consideration during this assessment and are elaborated on in this report.

The National Department of Forestry, Fisheries and the Environment (DFFE) is the competent authority for this Basic Assessment process, and the development needs to be authorised by this Department.

Public Participation Process

The public participation process comprised of the following:

- Notification and distribution of the Background Information Document (this document) to identified stakeholders and I&APs on the 14th of October 2025 to announce the project and inviting stakeholders to register as an I&AP and participate in the public participation process;
- Placement of an advertisement in the local/regional newspaper. An advertisement in the local language (i.e., IsiZulu) was placed in the Zulu Observer Newspaper on the 10th of October 2025;
- Placement of site notices at conspicuous locations on site. Six site notices in English and IsiZulu were erected on site at the start, middle and end points of the proposed development on the 3rd of October 2025 notifying I&APs of the proposed activity and inviting them to register; and
- Relevant I&AP's consultation to address issues and concerns raised.

Specialist Studies

The following specialist studies have been undertaken and reviewed as part of the Basic Assessment process:

- **Terrestrial Biodiversity Compliance Statement:** The project is supported provided that mitigation measures are implemented and incorporated into the Environmental Management Programme and Environmental Authorisation.

- **Agricultural Compliance Statement:** The project is supported as the sensitivity of the project, which was valued “Medium to High” as per the DFFE screening tool, was disputed to have a “Medium to Low” sensitivity.
- **Wetland Delineation and Functional Assessment:** The project is supported provided that mitigation measures are implemented and adhered to, which will be considered favourable due to the water challenges experienced on site.
- **Heritage Impact Assessment and Desktop Paleontological Assessment:** The project is supported provided that mitigation measures are implemented during the construction and operation phases of the development.
- **Geotechnical Investigation:** The site is generally stable and suitable for the proposed development, provided the geotechnical recommendations are adhered to.
- **Groundwater Assessment:** The results of analysis indicate that the acute health limits are exceeded for E. coli in selected boreholes and the chronic health limits are exceeded for aluminium, arsenic, iron and manganese in selected boreholes. Thus, the borehole water is not suitable for human consumption without treatment.
- **Floodline Assessment:** It is the opinion of the specialist that the development will have a minimal impact upstream and downstream of the watercourse.
- **Climate Change Impact Assessment:** It is in the opinion of the specialist that the proposed development is supported as the climate change impacts that will be experienced on site will not hinder the operation of the proposed development

Main findings of the EIA

Construction and operational phase impacts ranged from High - Low pre-mitigation. All the anticipated impacts can however be significantly reduced through the mitigation measures provided to Low - Minor levels of impact significance ratings.

Residual risks are expected to be of short duration and of Low - Minor impact significance, provided that the mitigation measures in this report are implemented. No significant cumulate effects on the environment (i.e., sensitive terrestrial habitats and species) are anticipated.

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Appendix A2 – Locality Map

Appendix A3 - Sensitivity Map

Appendix B: Site Photographs

Appendix C: Facility illustration(s)

Appendix C1 – Design of the Mabibi Water Treatment Plant

Appendix C2 – Preferred Rising Main Route (D1)

Appendix C3 – Alternative Rising Main Route (D2)

Appendix D: Specialist Reports

Appendix D1 – Agricultural Assessment

Appendix D2 – Terrestrial Biodiversity Assessment

Appendix D3 – Climate Change Assessment

Appendix D4 – Watercourse Assessment

Appendix D5 – Groundwater Assessment

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Appendix E: Public Participation

Appendix E1 – PPP Summary

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Appendix H: Details of EAP and Expertise

Appendix I: Additional Information

Appendix I1 – DFFE Meeting Minutes

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**APPENDIX 1: NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT NO. 107 OF 1998):
ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS 2014 (AS AMENDED)**

SECTION OF APPENDIX 1 OF THE EIA REGULATIONS	DESCRIPTION OF THE SECTION	ASSOCIATED SECTION WITHIN THE BAR
3a	Details of the EAP and CV	Page 2
3b	Location of the activity	Section 1.6
3c	A layout plan	Section 1.6
3d	Description of the scope of the proposed activity including the triggered and specified activities, associated structures and infrastructure and the way the proposed development relates to the triggered activities	Section 1.2 and 1.4
3e	Description of the policy and legislative context within which the development is proposed and how is each one applicable to the proposed activity	Section 3
3f	The motivation for the need and desirability (including the development at that specific location)	Section 4
3g	The motivation for the preferred site, activity, and technology alternative	Section 1.5
3h (i)	Details of all the alternatives considered	Section 1.5
3h (ii)	Details of the Public Participation Process (PPP) undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs	Section 5
3h (iii)	A summary of the issues raised by interested and affected parties, and an indication of the way the issues were incorporated, or the reasons for not including them	Section 5
3h (iv)	The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects	Section 2
3h (v)	The impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration, and probability of the impacts, including the degree to which these impacts- (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed, or mitigated;	Section 6.2
3h (vi)	The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives	Section 6.1
3h (vii)	Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects	Section 6.2
3h(viii)	The possible mitigation measures that could be applied and the level of residual risk	Section 6.2
3h(ix)	The outcome of the site selection matrix	Section 6.2
3h(x)	If no alternatives, including alternative locations for the activity, were investigated, the motivation for not considering such	Section 1.5
3h(xi)	A concluding statement indicating the preferred alternatives, including the preferred location of the activity	Sections 4.2 and 6.3
3i	A full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including-	Section 6.2

SECTION OF APPENDIX 1 OF THE EIA REGULATIONS	DESCRIPTION OF THE SECTION	ASSOCIATED SECTION WITHIN THE BAR
	(i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and (ii) an assessment of the significance of each issue, risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures	
3j	An assessment of each identified potentially significant impact and risk	Section 6.2
3k	Where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report	Section 2
3l	An environmental impact statement containing a map and a summary of the positive and negative impacts of the proposed development and alternatives	Section 6.3
3m	Based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr	Section 6.4
3n	Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of the authorisation	Section 6.8
3o	A description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed	Section 6.5.
3p	A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation	Section 6.8
3q	Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post-construction monitoring requirements finalised	Section 6.6
3r	An undertaking under oath or affirmation by the EAP	Refer to Appendix H
3s	Where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of adverse environmental impacts	Not Applicable

SECTION 1: DESCRIPTION OF THE PROPOSED ACTIVITY & LOCALITY

1.1 PROJECT TITLE

The Proposed Mabibi Water Supply Scheme Work Package 5 located within Ward 8 of the uMhlabuyalingana Local Municipality, uMkhanyakude District Municipality, KZN.

1.2 DESCRIPTION OF THE ACTIVITIES TO BE UNDERTAKEN INCLUDING ASSOCIATED STRUCTURE AND INFRASTRUCTURE AS PER SECTION 3(D) (II)

2014 EIA Regulations (as amended), Appendix 1- 3(d) a description of the scope of the proposed activity, including (ii) a description of the activities to be undertaken including associated structures and infrastructure.

uMngeni-uThukela water intends to implement the proposed Mabibi Water Supply Scheme in order to address the numerous water supply challenges being experienced under the uMhlabuyalingana Municipality areas of jurisdiction, thus uMngeni-uThukela water has sought funding from the Water Service Infrastructure Grant (WSIG) on behalf of uMkhanyakude District Municipality, the Water Services Authority and Water Service Providers for addressing the growing challenges of water supply.

The water demand for the project are based on the following data:

- Estimated projected project population, based on the 2023 estimated population projected to year 2043. The population growth rate is estimated at 1.95% per annum as provided by STATS SA 2022 census data; and
- The water demands per capita is estimated at 120Litres per day.

The projected current and 2043 water demand for Ward 8, which includes the Mabibi area is shown in Table 1 below.

Table 1: The current and projected water demand

Ward No.	Sub Wards	Population		AADD (ML/day)	
		2023	2043	2023	2043
Ward 8	Mabibi	748	1 100	0,10	0,15
	Manzengwenya	374	550	0,05	0,07
	Nkundwini	249	367	0,03	0,05
	Total	1 371	2 017	0,18	0,27
Criteria				Year	
				2023	2043
Population growth assuming 1.95% growth rate				1 3 71	2 017
Consumption per capita per day				120 l/c/d	120 l/c/d
Annual Average Daily Demand (AADD)				180 kl/d	270 kl/d
Allow 15% water losses				207 kl/d	311 kl/d
SPD Demand (Peak Demand Factor of 1.9)				393 kl/d	590 kl/d
WTW Capacity					
Add: 15% water treatment losses				59 kl/d	89 kl/d
WTW Capacity Requirement				452 kl/d	679 kl/d
					1000 kl/d

Based on the above information, the projected water demand for Mabibi is 0,59ML/day and as such the proposed plant has been sized for a capacity of 1ML/day.

The sections below provide details into the proposed Mabibi Package WTP and associated infrastructure:

Mabibi Package Water Treatment Plant

The total development footprint of the proposed Mabibi Package WTP is 112m². The water treatment plant will consist of a security fence, proposed access road, proposed 50kl elevated tank and base, proposed valve chamber for the elevated water tank, proposed sludge bed and the proposed water treatment works. It will be sized for the capacity of 1ML/day and will pump a total of 11.5 l/sec (41.7 m³/hour). The water quality produced will be of Class 1, in accordance with the SANS 241: 2015.

The proposed elevated tank is sized to be 50kl, 15m in height and is stabilized with galvanized steel panels. This tank will be located within the WTP.

Please refer to **Figure 1 – Design of the WTP**.

Details of the Water Treatment Process at the Plant

The plant's treatment processes will be engineered to effectively remove iron, manganese, turbidity, colour, and organic compounds, ensuring the water is properly disinfected to meet SANS 241: 2015 standard. The supply voltage for the facility is three-phase, 400V at 50Hz. The primary treatment sequence includes pre-oxidation (if necessary), coagulation, flocculation, clarification, filtration, and post-disinfection, collectively ensuring the delivery of safe and quality drinking water.

The section below describes the primary treatment sequence of the plant:

- **Coagulation, Flocculation and Clarification**

A pre-chlorination facility will be installed, if necessary, if the lake water presents elevated organic content. A coagulant dosing point will be positioned upstream of a flash mixer within the raw water pipeline. This system will utilize an Ion Charge Analyser to precisely control the coagulant dosage, ensuring optimal coagulation conditions for effective water treatment.

The raw water will pass sequentially through a flocculation column and then into a lamella clarifier. Rapid mixing occurs at the flash mixer, followed by slower mixing and floc formation within the flocculation column, which has a volume of 5.65 m³ and provides approximately 8 minutes of retention time at the designed flow rate of 42 m³/hour. Sludge removal from the flocculation process is manual, aligned with plant operation, and sedimentation within this column is minimal.

The system consists of a single clarifier, measuring 2.2 meters wide, 3.2 meters high, and 6 meters long, with a settling surface area of 13.2 m². The incorporation of lamella plates increases the effective surface area to 50 m², reducing the upflow rate to 0.84 m/hour and enhancing sedimentation efficiency. The clarifiers are constructed from fiberglass to resist corrosion in the Mabibi environment, with automated desludging facilitated by pneumatically operated butterfly valves controlled via an adjustable Schneider timer.

- **Filtration**

The clarified water will flow by gravity into a settling tank measuring 2 meters in diameter and 2 meters in height. From this tank, the settled water will be pumped through five silica sand filters into the existing filtered water reservoir. The proposed filter pumps are Grundfos NK 50-200/219 models, equipped with a 3-kW motor. These pumps will also facilitate the backwashing of filters, eliminating the need for separate backwash pumps.

Each filter has a diameter of 1.2 meters, providing a surface area of approximately 1.22 m². At a designed flow rate of 42 m³/hour, this setup achieves a linear filtration rate of 6.88 m/hour. A side channel blower will be

installed to air scour the filters, ensuring effective removal of dirt from the filter beds. The backwash process is fully automated, controlled via pneumatic actuated valves and managed by a Schneider timer integrated into the plant's MCC.

- **Waste Stream Management**

The sludge generation rate is estimated at 10 kg/ per day. To manage the wet sludge produced by the package plant, two sludge drying beds will be installed, each measuring 5m by 3m. The dried solids will be periodically transported to a landfill in Mbazwana every three months. A 2m³ skip bin will be utilized for the transportation of the dried solids from the plant to the designated landfill site located 1km North West from the town of Mbazwana.

It is important to note that the applicant is in consultation with the uMhlanbuyalingana LM on the disposal of sludge. Proof of disposal will be submitted with the Second Draft BAR.

- **Coagulant Dosing**

The coagulant dosing system will comprise duty-standby Grundfos DDE 6-10 coagulant dosing pumps, a Lechintech Ion Charge Analyser, and a sample collection pot. The dosing pumps will be controlled via a PID system integrated within the plant's MCC, allowing precise regulation of coagulant application. The pumps will draw coagulant from a 200L day tank, with no provisions for bulk chemical storage at the site.

A sample of the raw water post-dosing will be directed to the Ion Charge Analyser's sample pot to assess charge neutralisation levels. The analyser's readings will enable the controller to adjust the pump output automatically, ensuring optimal coagulant dosage under varying raw water conditions. The system will operate in synchronization with raw water flow, activating only when flow is present to optimize efficiency and chemical usage.

- **Flow monitoring and Filtered water transfer**

Flow measurement of raw and filtered water within the plant will be done using Autento ultrasonic flow meters, installed respectively on the raw water inlet and filtered water outlet lines. The filtered water will be transferred into a 10,000-liter buffer tank situated at ground level, serving as an intermediary storage before distribution.

The water will be pumped from the buffer tank to the 15 kl elevated tank using a duty/standby pair of Grundfos transfer pumps, each rated at 5.5 kW with NK 50-125/142 specifications. The operation of these pumps will be managed via level probes on their suction and discharge sides, ensuring protection against dry running and preventing overflow of the reservoir.

- **Civil and Power requirements**

The civil infrastructure for the water treatment plant includes a dedicated plant room measuring approximately 40m², with dimensions around 8 m by 5 m, although the exact configuration is flexible. A concrete foundation of 9m by 7m is required to support key components such as the clarifier, settled water tank, and flocculation column.

Regarding electrical requirements, the raw water pump necessitates a power supply of 15 kW, with a recommended 25 kW, three-phase transformer operating at 400V to ensure adequate capacity. The water treatment plant itself requires 18kW, with a recommended 50kW, three-phase transformer at 400 V, to accommodate potential future increases in energy demand on the site

Details of the Floating Raw Water Abstraction at Lake Sibayi

The abstraction works structure will be in the form of a floating raw water pumpstation supported on aluminium tanks and equipped with submersible raw water pumps. This structure is designed as such to omit disturbing or diverting the flow of water into the lake. The pump station will be anchored to the shore of the lake by an antirust chain bolted onto a concrete stub column on the edge of Lake Sibayi. This will allow the pumpstation to be pulled to shore for operation and maintenance purposes.

Abstraction depth is 3m below the surface of Lake Sibayi.

- Invert levels of the rising main are located in a uniform depth of 1.2m below ground level
- Base demand is 11.5l/s and peak factor is 1.5
- The development footprint of the structure is 10.92m²

The proposed abstraction system for the raw water source consists of a single self-priming Cornell pump mounted on a custom-fabricated float, with a standby pump stored at the water treatment plant and not installed. The float will be securely anchored to enable access to the pump and electrical components by pulling the structure to the side of the lake. A flexible Mineflex delivery line will be used to accommodate the movement of the float. Electrical controls for the pump will be mounted on the float to prevent vandalism. The operation of the raw water pumps will be fully automated, utilizing a no-flow switch and pressure control system to shut off the pumps at high pressure and automatically restart them after a predetermined delay (Ziyanda Annexure K WTW design report, 2024)

The design of the abstraction works makes provisions to ensure that water flows into the lake is not disturbed or diverted. In addition, the design ensures that the process of raw water extraction is undertaken in a manner that minimize ecological disturbance as the structure of the floating raw water abstraction works has a small footprint, therefore minimizing the disruption to aquatic habitats.

Raw water Rising Main Pipeline

The construction of a 2000m raw water rising main made of uPVC pipeline with a diameter of 160mm from the abstraction works to Mabibi Package Water Treatment Plant.

Please refer to **Figure 2 – Design of the Preferred Rising Main Pipeline.**

Proposed Construction Site Camp

The proposed construction camp is located at coordinates 27°19' 39.58" S, 32°43' 36.95" E approximately 1283.65m South-West from Lake Sibayi. The total surface area of the proposed construction camp is 1050m². The campsite consists of the following specifications:

- RE Site office
- Covered parking area
- Covered Eating area
- Guard house
- Storage facility
- Contractors site office
- Ablution facilities
- Assembly point
- Hazardous material storage facility
- Waste bins
- Entrance gate

Please refer to **Figure 3 – Overall Design Layout**, illustrating the Mabibi Package Water Treatment Plan, the Preferred Rising Main Pipeline Route, the Abstraction Point and the Proposed Site Camp.





Figure 2: Map Illustrating the Preferred Rising Main Pipeline Design

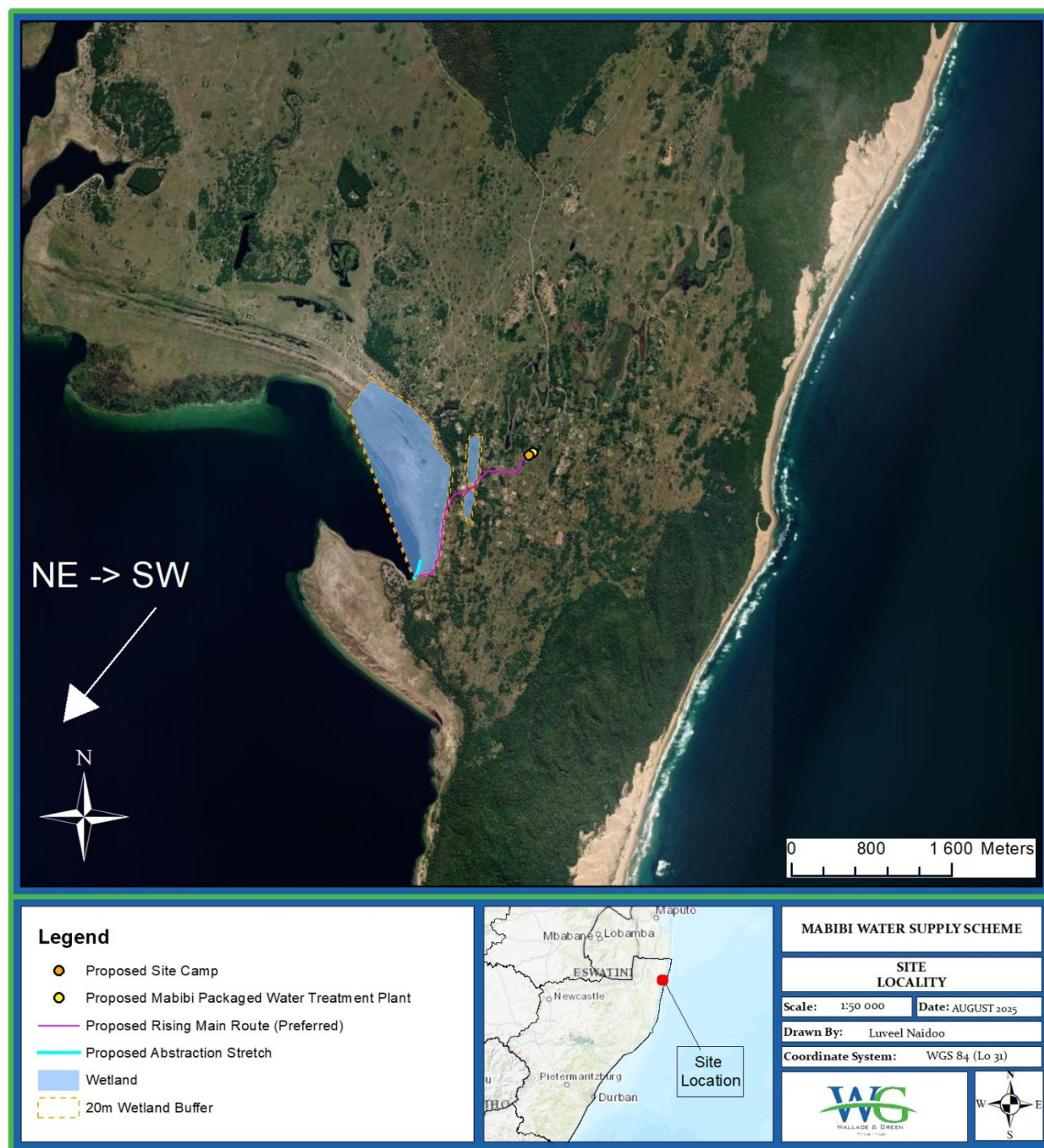


Figure 3: Overall Design Layout, illustrating the Mabibi Package Water Treatment Plan, the Preferred Rising Main Pipeline Route, the Abstraction Point and the Proposed Site Camp

Table 2: Property Details

Province/s	KwaZulu Natal
District Municipality/ies	uMkhanyakude District Municipality
Local Municipality/ies	uMhlabuyalingana Local Municipality
Ward number/s	8
Nearest town/s	Jozini

Portion number/s

Erf 15834, Erf 17497, Portion 11 of Erf 15834, Portion 14 of Erf 15834 and Portion 53 of Erf 17497

Table 3: Surveyor General 21-digit code

N	0	H	V	0	0	0	0	0	0	0	1	5	8	3	4	0	0	0	0	0
N	0	H	V	0	0	0	0	0	0	0	1	7	4	9	7	0	0	0	0	0
N	0	H	V	0	0	0	0	0	0	0	1	5	8	3	4	0	0	0	1	1
N	0	H	V	0	0	0	0	0	0	0	1	5	8	3	4	0	0	0	1	4
N	0	H	V	0	0	0	0	0	0	0	1	7	4	9	7	0	0	0	5	3
1	2			3				4								5				

Table 4: Geographical location the Proposed Infrastructure**Proposed Mabibi Package WTP:**

FEATURE	LATITUDE (S)			LONGITUDE (E)		
	DEG	MIN	SEC	DEG	MIN	SEC
Centre Point	27°	19'	38.91"	32°	43'	37.55"

Proposed Rising Main Pipeline:

FEATURE	LATITUDE (S)			LONGITUDE (E)		
	DEG	MIN	SEC	DEG	MIN	SEC
Start	31°	37'	6.10"	29°	32'	40.40"
Middle	31°	36'	45.80"	29°	32'	21.00"
End	31°	36'	4.80"	29°	31'	52.60"

Proposed Abstraction Point:

FEATURE	LATITUDE (S)			LONGITUDE (E)		
	DEG	MIN	SEC	DEG	MIN	SEC
Centre Point	27°	20'	17.29"	32°	42'	57.22"

1.3 SPECIALIST STUDIES

The following specialist assessments were conducted and the major findings of each specialist assessment are presented as per the following:

Agricultural Assessment:

An Agricultural Assessment was undertaken by Eco-Assist Environmental Consultants for the Proposed Mabibi Water Supply Scheme in September 2024. The findings of the assessment are summarised below:

- As per the desktop assessment for the project area, the terrain of the project site has dunes rising and falling throughout the area, with elevations ranging from 18 masl to 38 masl (meters above sea level), which indicates that the landscape generally drains towards Lake Sibayi.
- The Water Supply project falls within two (2) land type units, which are Hb52 and Hb54, along the western and eastern boundary of the project are respectively. The Hb52 land type is dominated by the valley bottom landscape positions which consists mainly alluvium with blown sand and calcareous sand, and small areas of red dune cordon sand of the Bluff Formation, whereas Hb54 land type is dominated by midslope landscape position and consists mainly of yellowish redistributed sand with red dune cordon sand of the Berea Formation and blown sand.
- The land potential of the project area ranges from Good to Moderate Potential as the soil within the project area consists of Fernwood/Clovelly and Westleigh/Longlands soil types. These soil types are classified as Class IV soil types which means that they are suitable for light cultivation to growing of crops within the area.

- The project is supported as the sensitivity of the project, which was valued “Medium to High” as per the DFFE screening tool, was disputed to have a “Medium to Low” sensitivity.

Please refer to **Appendix D1 – Agricultural Assessment**

Terrestrial Biodiversity Assessment:

A Terrestrial Biodiversity Assessment was undertaken by Rautenbach Biodiversity Consulting for the Proposed Mabibi Water Supply Scheme in June 2024. The findings of the assessment are summarised below:

- The proposed Mabibi water supply project falls within the Indian Ocean Coastal belt, which is classified as Endangered and Moderately Protected. The vegetation located within this area would be dry grasslands, thickets and other non-forest type plant communities.
- The proposed water supply project is located within two (2) reserves, Lake Sibayi Freshwater Reserve and Coastal Forest Reserve, which are part of the iSimangaliso Wetland Park.
- The Site Ecological Importance (SEI) of the proposed development is regarded as “High” due to the proposed development located within the iSimangaliso Wetland Park, the presence of Species of Conservation Concern (SCC) flora and fauna.
- From a terrestrial biodiversity perspective, the development is supported provided that mitigation measures implemented and incorporated into the Environmental Management Programme and Environmental Authorisation.

Please refer to **Appendix D2 – Terrestrial Assessment**

Climate Change Assessment:

A Climate Change Assessment was undertaken by Bluegreen Environmental Consultants for the Proposed Mabibi Water Supply Scheme in September 2025. The findings of the assessment are summarised below:

- The project site falls within a tropical climate zone and it experiences an average temperature of 18°C or higher along with the timing of seasonal rains.
- The project site experiences an average temperature range varied between 22°C for cooler year, 23°C for an average year, and 24°C for warmer year.
- The eastern part of Lake Sibayi experiences less precipitation whereas the western part of Lake Sibayi experience more precipitation by 24mm. However, currently Lake Sibayi is experiencing a warm scenario, the precipitation for the whole area has reached above 30mm.
- The water balance for Mabibi was observed through the use of climate model projections. The model projections indicated that there was no change in the water table for the whole area around Lake Sibayi, which illustrates that as mean global temperatures rise, the Mabibi area wetness/dryness conditions will not change relative to the historical norm.
- As per the climate change assessment, it has been noted that the water source, Lake Sibayi, will most likely be impacted through overuse of water source which might negatively impact the aquatic ecosystem and fluctuate water levels and the biodiversity of the vicinity of Lake Sibayi will be affected since it is heavily dependent on the change climate which would define the riparian corridors and buffers and climate-dependent vegetation.
- It is in the opinion of the specialist that the proposed development is supported as the climate change impacts that will be experienced on site will not hinder the operation of the proposed development.

Please refer to **Appendix D3 – Climate Change Impact Assessment**

Wetland Delineation and Functional Assessment:

The Wetland Delineation and Functional Assessment was undertaken by The River Guy for the Proposed Mabibi Water Supply Scheme in September 2025. The findings of the assessment are summarised below:

- The proposed project area falls within the iSimangaliso Strategic Water Resource Area.
- The proposed Water Supply project is located with an Unnamed Sub-Quaternary Catchment area.
- The Present Ecological State (PES) of the site is “Largely Modified” (category D) with a Ecological Importance of “Moderate”. This is a result of anthropogenic impacts (i.e. establishing roads, subsistence farming, rural settlements) and clearing of vegetation.
- Three (3) HGM units were identified in close proximity of the proposed water supply project, which are valley floor wetlands. These wetlands appear unaltered and are still in a natural state despite the presence of informal gravel roads and the subsistence farming undertaken by the surrounding rural settlements.
- The development is supported provided that mitigation measures are implemented and adhered to, which will be considered favourable due to the water challenges experienced on site.

Please refer to **Appendix D4 – Wetland Delineation and Functional Assessment:**

Groundwater Assessment:

The Groundwater Assessment was undertaken by Terratest Consultants for the Proposed Mabibi Water Supply Scheme in September 2024. The findings of the assessment are summarised below:

- The proposed project area falls within the W70 Quarternary Catchment which is underlain by Cretaceous age Siltstone at depth which have a medium to coarse grained sand layers.
- The project area receives a mean annual precipitation 0.716 m/a and requires a recharge demand of 78.15mm/a.
- A hydrocensus survey of the existing resources was carried out for the project area in order to establish the groundwater use and potential borehole yield in the project area. Two (2) boreholes were identified 1.64km east from the project area and these boreholes are in use by the surrounding community.
- The groundwater quality from the boreholes was tested and it was indicated that the groundwater was consistently reported as poor due to the presence of microbiological compounds, aluminium, arsenic, iron and manganese exceeding the SANS241 drinking water quality screening limits. Thus, the borehole water is not suitable for human consumption without treatment.

Please refer to **Appendix D5 – Groundwater Assessment**

Geotechnical Assessment:

The Geotechnical Assessment was undertaken by Geosure (Pty) Ltd, dated April 2024. The findings of the assessment are summarised below:

- The project are is generally stable and underlain by minimal fill material, and deposits of colluvium, alluvium, and aeolian soils.
- Groundwater concentrations were identified at 5 tests pits (IP1, and IP15 – IP 18), with well-developed groundwater conditions. This is attributed to the proximity to Lake Sibayi.
- An intermittent perched groundwater condition may be encountered during construction, especially after heavy rainfall events.
- Samples of aeolian material meets the requirements for Select Fill which can be used when backfilling for the proposed rising main. Aeolian deposits must undergo laboratory verification.

- Foundations placed on the collapsible, loose colluvial, alluvial, and aeolian soils are likely to undergo excessive settlement and potential experience bearing capacity failure even under light to moderate loads.
- The site is generally stable and suitable for the proposed development, provided the geotechnical recommendations are adhered to.

Please refer to **Appendix D6: Geotechnical Assessment**

Heritage Impact and Desktop Paleontological Impact Assessment

A Heritage Impact and Desktop Paleontological Impact Assessment was conducted by Land Matters Environmental Consulting in July 2024. The findings of the assessment are summarised below:

- As per the Desktop PIA, the project site is underlain by Quaternary-aged Aeolian sands of the Berea Formation, Maputaland Group.
- Two grave sites were identified near the project site. Both graves belong to family members of residents currently living in the area. The exact of the graves is unknown, both are most likely less than 60 years old.
- The heritage consultant is in support of the development provided that mitigation measures are implemented during the construction and operation phases of the development.

Please refer to **Appendix D7 – Heritage Impact Assessment**

Floodline Assessment

A Floodline Assessment was conducted by Pink Africa Consulting in August 2024. The findings of the assessment are summarised below:

- The rainfall station, Mbazwane, was utilised to adopt 24-hour design rainfall depths for different return periods for the propose development. It is indicated that the proposed development is subjected to intense high-depth storm events within a 24-hour period, i.e. 103.7 mm of rain accumulates over a 2-year return period and 471.3mm within a 100-year return period.
- A flood level analysis was conducted for the proposed development utilising 1:10 year, 1:50 year and 1:100-year recurrence for the estimated peak flows. The results indicate that the highest peak flow will be experienced in the 1:100-year interval with a value of 2088.60mm.
- The proposed development will not intersect the floodplains as the resulting floodlines and flood levels are confined within the embankments of Lake Sibayi and will less likely affect the proposed development. This is based on the assumption that the watercourses are free-flowing, without any obstructions or structures located within them.

Please refer to **Appendix D8 – Floodline Assessment**

Table 5 below makes reference to specialist studies identified in the NEMA Screening Tool (**Appendix I2**). As per the Screening Tool, it is the responsibility of the EAP to confirm the list and to motivate in the assessment report, the reason for not including any of the identified specialist study.

Table 5: Specialist Studies from the NEMA Screening Tool

Specialist Study	Motivation
Landscape/Visual Impact Assessment	This assessment was not undertaken as the proposed development will not result in any landscape / visual impacts. It is important to note that the proposed rising main will be established along the disturbed existing

	gravel road and the site proposed for the WTP has been disturbed by past agricultural activities. The proposed project also received support from the Agricultural Assessment (2024), by stating that the sensitivity of the project, which was valued “Medium to High” as per the DFFE screening tool, was disputed to have a “Medium to Low” sensitivity.
Archaeological and Cultural Heritage Impact Assessment	Please refer to Appendix D7 – Heritage Impact Assessment. In summary, the heritage consultant is in support of the development provided that mitigation measures are implemented during the construction and operation phases of the development.
Palaeontology Impact Assessment	Please refer to Appendix D7 – Heritage Impact Assessment. In summary, the heritage consultant is in support of the development provided that mitigation measures are implemented during the construction and operation phases of the development.
Terrestrial Biodiversity Impact Assessment	Please refer to Appendix D2 – Terrestrial Biodiversity Assessment. In summary, from a terrestrial biodiversity perspective, the development is supported provided that mitigation measures implemented and incorporated into the Environmental Management Programme and Environmental Authorisation.
Aquatic Biodiversity Impact Assessment	Please refer to Appendix D4 –Watercourse Assessment.
Hydrology Assessment	Please refer to Appendix D4 –Watercourse Assessment.
Socio-Economic Assessment	This assessment was not conducted as the proposed project intends to implement the proposed Mabibi Water Supply Scheme in order to address the numerous water supply challenges being experienced under the uMhlabuyalingana Municipality areas of jurisdiction The socio-economic impacts for the proposed project were considered in the Engineering Design Report – Appendix D9.
Plant Species Assessment	Please refer to Appendix D2 – Terrestrial Biodiversity Assessment. In summary, from a terrestrial biodiversity perspective, the development is supported provided that mitigation measures implemented and incorporated into the Environmental Management Programme and Environmental Authorisation.
Animal Species Assessment	Please refer to Appendix D2 – Terrestrial Biodiversity Assessment. In summary, from a terrestrial biodiversity perspective, the development is supported provided that mitigation measures implemented and incorporated into the Environmental Management Programme and Environmental Authorisation.

1.4 All Listed and Specific Activities Triggered and Applied for as per Section 3(d) (i)

2014 NEMA EIA Regulations (as amended), Appendix 1- 3(i) all listed and specified activities triggered and being applied for:

Table 6: Listed and specified activities triggered and being applied for

GNR	Activity Number	Activity as per legislation	Activity applicability
Listing Notice 1 (Basic Assessment)			
Government Notice Regulation (GNR) No. 327	Activity 9	<i>The development of infrastructure exceeding 1 000 metres in length for the bulk transportation of water or storm water— (i) with an internal diameter of 0,36 metres or more; or</i>	The proposed Water Scheme will comprise of the following: Establishment of a 2000m 160mmØ bulk uPVC rising

of the EIA Regulation (2014)		(ii) with a peak throughput of 120 litres per second or more; excluding where— (a) such infrastructure is for bulk transportation of water or storm water or storm water drainage inside a road reserve or railway line reserve; or (b) where such development will occur within an urban area.	main from the abstraction point (Lake Sibayi) to the Mabibi Package Water Treatment Plant. The proposed project falls within a rural area.
	Activity 12	The development of— (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs— (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; — excluding— (aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; (bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies; (cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies; (dd) where such development occurs within an urban area; (ee) where such development occurs within existing roads, road reserves or railway line reserves; or (ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared.	The proposed project will involve the establishment of a floating raw water abstraction work and a rising main with a total physical footprint of approximately 13 580m². The development will occur within a watercourse.

Listing Notice 3 (Basic Assessment)			
Government Notice Regulation (GNR) No. 324 of the EIA Regulation (2014)	Activity 12	<i>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</i> <i>d. KwaZulu-Natal</i> <i>i. Trans-frontier protected areas managed under international conventions;</i> <i>ii. Community Conservation Areas;</i> <i>iii. Biodiversity Stewardship Programme Biodiversity Agreement areas;</i> <i>iv. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;</i> <i>v. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</i> <i>vi. Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuarine functional zone, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas;</i> <i>vii. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning;</i> <i>viii. A protected area identified in terms of NEMPAA, excluding conservancies;</i> <i>ix. World Heritage Sites;</i> <i>x. Sites or areas identified in terms of an international convention;</i> <i>xi. Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose;</i> <i>xii. Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; or</i> <i>xiii. In an estuarine functional zone.</i>	The total development footprint of a floating raw water abstraction work and the rising main pipeline is 13 580m². More than 300 m² of indigenous vegetation will be cleared for the construction of proposed infrastructure. The proposed development footprints are in the Coastal Forest Reserve in iSimangaliso Wetland Park. The Park has been declared a World Heritage Site and is a Protected area.

Activity 14	<i>The development of—</i> <i>(i)</i> <i>dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or</i> <i>(ii)</i> <i>infrastructure or structures with a physical footprint of 10 square metres or more;</i> <i>where such development occurs—</i> <i>(a) within a watercourse;</i> <i>(b) in front of a development setback; or</i> <i>(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;</i> <i>excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.</i> <i>a.KwaZulu-Natal</i> <i>i. Trans-frontier protected areas managed under international conventions;</i> <i>ii. Community Conservation Areas;</i> <i>iii. Biodiversity Stewardship Programme Biodiversity Agreement areas;</i> <i>iv. In an estuarine functional zone;</i> <i>v. In a Protected Area identified in the NEMPAA;</i> <i>vi. World Heritage Sites;</i> <i>vii. Areas on the watercourse side of the development setback line or within 100 metres from the edge of a watercourse where no such setback line has been determined;</i> <i>viii. Areas within a watercourse or wetland;</i> <i>ix. Sites or areas identified in terms of an international convention;</i> <i>x. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</i> <i>xi. Core areas in biosphere reserves;</i> <i>xii. Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose; or</i> <i>xiii. Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority.</i>	The floating raw water abstraction works with a development footprint of 10.92m² will be located within Lake Sibayi. The development footprint of the raw water rising main from the abstraction works to Mabibi Package Water Treatment Plant is 13580m². The proposed infrastructure will be installed within a rural area. The proposed project is located within iSimangaliso Wetland Park, a World Heritage Site.
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1.5 Description of Feasible Alternatives as per Section 3(h) (i)

2014 NEMA EIA Regulations (as amended), Appendix 1- 3(H) a full description of the process followed to reach the proposed preferred alternative within the site, including (i), (iv).

“Alternatives”, in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to —

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

Alternative S1 (Only Site Alternative): Mabibi Water Supply Scheme located within the Umhlabuyalingana Local Municipality and uMkhanyakude District Municipality. The property details are provided in Table 7.

Table 7: Property Details

District Municipality	uMkhanyakude District Municipality
Local Municipality	uMhlabuyalingana Local Municipality
Ward	8
Area / Town / Village	Jozini
Property Description	Erf 15834, Erf 17497, Portion 11 of Erf 15834, Portion 14 of Erf 15834 and Portion 53 of Erf 17497
SG Codes	N0HV00000001583400000
	N0HV00000001749700000
	N0HV00000001583400011
	N0HV00000001583400014
	N0HV00000001749700053

It is important to note that the properties are owned by the Ingonyama Trust Board. The applicant is in discussion with the Trust Board to obtain the applicable landowner consent. The landowner consent will be submitted with the Second Draft BAR.

No Site Alternatives were considered for the proposed project as the project is aimed at providing basic water services to the community of Mabibi.

(b) The type of activity to be undertaken

The proposed infrastructure for the Mabibi Water Supply Scheme will include the following:

- A floating raw water abstraction work with two (2) pumps, where one (1) shall be utilised and the other will be on standby.
- Establishment of a 2000m 160mmØ bulk uPVC rising main from the abstraction point (Lake Sibayi) to the Mabibi Package Water Treatment Plant
- The proposed Mabibi Packaged Water Treatment Plant (WTP) is sized to service a capacity of 1Ml/day.
- A 50kl elevated tank for the storage of clean water within the Mabibi WTP.

(c) The design or layout of the activity

❖ Design Alternatives:

The following design alternatives were investigated for the Proposed establishment of the 2000m 160mmØ bulk uPVC rising main from the abstraction point (Lake Sibayi) to the Mabibi Package WTP:

- **Rising Main Option 1 (Preferred)** – The proposed establishment of the 2000m 160mmØ bulk uPVC rising main from the abstraction point (Lake Sibayi) to the Mabibi Package WTP. The route of the rising

main will follow the existing D1848 gravel road, thus avoiding the wetland sensitive areas delineated on the site. The route was supported by the Wetland Specialist (2025), which scored the impacts a “Low” significance rating.

Please refer to **Figure 4 – Rising Main Option 1 (Preferred)**.

- **Rising Main Option 2 (Not Supported)** - The proposed establishment of the 2000m 160mmØ bulk uPVC rising main from the abstraction point (Lake Sibayi) to the Mabibi Package Water Treatment Plant. The route of the rising main intercepts the delineated wetland system at two sections. This route was not supported by the Wetland Specialist (2025) due to the medium – high impacts associated with the wetland destruction.

Please refer to **Figure 5 – Rising Main Option 2 (Not Supported)**.

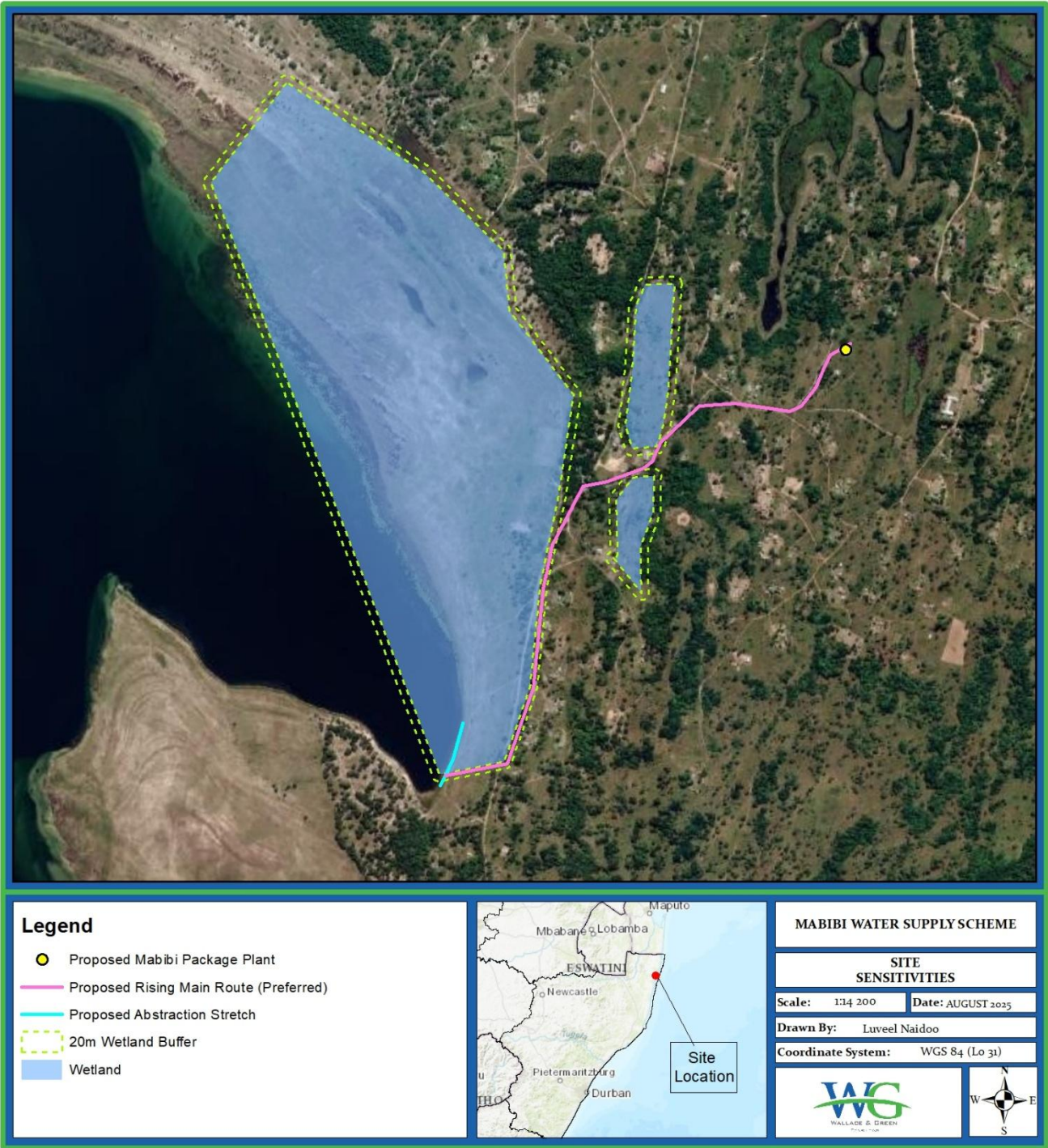


Figure 4: Preferred Rising Main Route (in Purple)

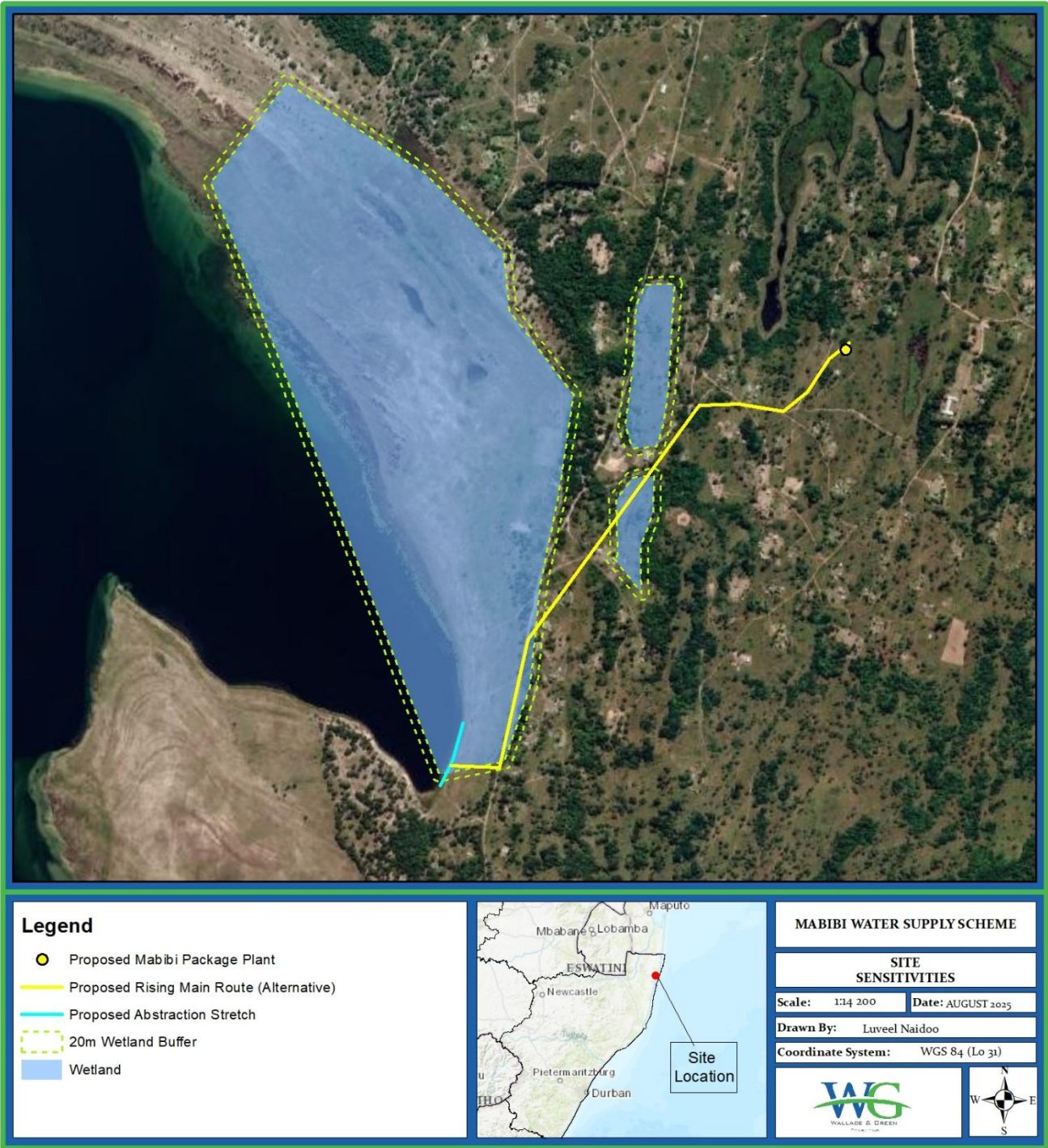


Figure 5: Alternative Rising Main Route (in Yellow)

(d) The technology to be used in the activity

It must be noted that three (3) technology alternatives were investigated for the abstraction of water to the Water Treatment Plant to service the community of Mabibi. The feasibility and economic sustainability of each alternative is discussed below.

❖ **Technology Alternatives:**

Three (3) technology alternatives were investigated for the Proposed abstraction of water to supply the Mabibi WTP:

- **Abstraction of 1ML/Day from the Lake Sibayi (Preferred) –**

The abstraction of water from the Lake Sibayi received Water Use Authorisation (WUA) from the Department of Water and Sanitation (DWS) on the 27th August 2024. The WUA authorised the allocation of 365 000 m³/a from Lake Sibayi to develop the Mabibi Package Plant Water Treatment Works as follows:

- uMkhanyakude District Municipality currently has an allocation of 1 825 000 m³/a under registration number 21121910 to supply water for drinking to the same communities reflected in the application. The District Municipality has an additional allocation of 649 250 m³/a under registration number 21160066 and 21160084 from the same lake for other areas.
- Therefore, DWS indicated that Umngeni – Uthukela Water Water proceed with the construction of the Mabibi Package Plant Water Treatment Works and abstract water from Lake Sibayi as there is an existing allocation under uMkhanyakude District Municipality.

It is also important to note that the abstraction of water from Lake Sibayi is a short-term intervention and will be discontinued once the supply from Jozini Dam reaches the Mabibi area.

A cost comparison between the planned long-term intervention of supplying the project area (Mabibi) from the Jozini Regional Water Supply Scheme and the short-term intervention of supply from Lake Sibayi are compared in Table 8.

Table 8: Cost Comparison of the Short-Term and Long-Term Interventions

Description	Short Term Intervention Lake Sibayi Water Supply	Long Term Intervention Jozini Water Supply Scheme
Bulk Infrastructure Cost (including VAT)	R26 438 816,25	R544 860 780,12

The cost estimate for the short-term intervention of supplying from Lake Sibayi is 4,9% of the cost estimate for the long-term intervention of supply from Jozini Dam. In view of the foregoing the short-term solution of abstracting from Lake Sibayi has been selected as recommended solution for the water supply challenges in the Mabibi area.

- **Abstraction from the Jozini Dam (Long-term Option) -**

uMkhanyakude District Municipality's (UKDM) Universal Access Plan Phase 3 proposes that the Mabibi area be supplied from Jozini Dam through the Jozini Regional Water Supply Scheme. The primary water source for the water supply scheme is Pongola Dam. Raw Water abstraction is currently at 37ML/day and is earmarked to be upgraded to 80ML/day in the future to accommodate other areas in Umhlabuyalingana LM and including the Mabibi area.

The infrastructure required will eventually deliver raw water supplies to the Mabibi area. According to UKDM, the implementation of the Jozini Regional Water Scheme has recently commenced with the first 10km of the 760mm diameter pipeline having been completed. Tenders for the balance of the 5,3km will be advertised the

next financial year. The envisaged completion of the bulk conveyance infrastructure to deliver raw water supplies to Mabibi could be completed in the next 30 to 40 years. This will also depend largely on funding provisions and annual budget allocations for the project.

It is important to note that once the water supply reaches the Mabibi area, this abstraction method will be implemented.

- **Supply from Boreholes (Not Supported) -**

A borehole Yield Analysis was conducted by Terratest (2024). The assessment noted that the volumes drawn from the two (2) boreholes associated with the Mabibi area was very low compared to the water demand requirements. The yield is outlined in the table below.

The highest abstraction volume from the borehole investigation is 0,83l/s (72kl/day) compared to the demand for the Mabibi area of 150kl/day. The boreholes are thus not a sustainable water supply solution.

Table 9: Borehole Details

Item No	Area	Borehole No.	BOREHOLE DETAILS			
			Nearest Feature	Coordinates		Yield (l/s)
				Latitude	Longitude	
1	Mabibi Phase 1	TBA	Nera Tonga Beach Lodge	27° 19' 40.61"	32° 44' 36.55"	0,4
2	Mabibi (WTW)	KZN010018	Next to Proposed Mabibi WTW site	27° 19' 40.24"	32° 43' 36.31"	0,83

(e) The operational aspects of the activity

The operational aspects relate to the daily operations of the Mabibi Package WTP and the abstraction from the Lake Sibayi. The management aspects relating to the operational aspects, e.g., stormwater management, waste management, water abstraction management have been addressed in the Specialist Studies (Appendix D) and incorporated in the Site-specific EMP – Appendix G.

(f) The option of not implementing the activity

The no-go alternative implies that the status quo remains, meaning the water crisis within the Mabibi Area will not be addressed. The proposed Mabibi Water Supply Scheme contributes directly to these local objectives by supplying safe drinking water to communities currently dependent on unreliable or unsafe water sources. It introduces critical water services which forms the foundation for broader socio-economic development by providing both infrastructure and job opportunities. Furthermore, the proposed rising main has been designed with a minimal environmental footprint, as it is located along an existing dirt road. The abstraction point will be located within Lake Sibayi however, floating infrastructure will be utilised, with minimal impact on the aquatic environment.

The project addresses a critical basic human need and reinforces the local municipality's spatial vision of sustainable and inclusive development, while taking cognisance of the sensitive ecological environment. The proposed Mabibi Water Supply Scheme will also support public health and wellbeing, and contribute to local socio-economic upliftment.

The Mabibi Water Supply Scheme aligns with and supports the strategic objectives and development goals in both the local and district municipalities. It strengthens the municipalities' capacity to deliver on their obligation to provide access to basic services, contribute to socio-economic upliftment, and promotes environmentally responsible development.

1.6 Project Locality as per Section 3(b) (i) – (iii)

2014 EIA Regulations, Appendix 1- 3(b) the location of the activity, including: (i) the 21 Surveyor General code of each cadastral land parcel.

Table 10: Location of the Proposed Activity

District Municipality	uMkhanyakude District Municipality
Local Municipality	uMhlabuyalingana Local Municipality
Ward	8
Area / Town / Village	Jozini
Property Description	Erf 15834, Erf 17497, Portion 11 of Erf 15834, Portion 14 of Erf 15834 and Portion 53 of Erf 17497
SG Codes	N0HV00000001583400000
	N0HV00000001749700000
	N0HV00000001583400011
	N0HV00000001583400014
	N0HV00000001749700053

Physical Size of the Activity

Site Alternative

Table 11: Site Alternative (only one site alternative considered)

Alternative S1:	Size of the Activity	Co-ordinates	
Mabibi Package WTP	Size – 112m ² Length – 34m Height – 20m	27°19'39.58"S	32°43'36.95"E
Rising Main Pipeline	Total Area – 1 3580m ² Length - 2000m Width – 160mmØ	27°20' 16.65" S	32°42'56.97" E
Elevated Water Tank	Total Storage – 50kl Length – 7m Height – 15m	27°19'39.14"S	32°43'36.51"E

Design or Layout Alternative

Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):

Table 12: Listed and specified activities triggered and being applied for

Zone:	Size of the site/servitude (m ²):	
	Alternative A1 (Preferred)	Alternative A2 (Not Supported)
Rising Main Pipeline	Total Area – 1 3580m ² Length - 2000m Width – 160mmØ	Total Area – 1 3580m ² Length - 2000m Width – 160mmØ

1.7 Site Access

Does access to the site exist?	YES ☒
If NO, what is the distance over which a new access road will be built	n/a
Describe the type of access road planned: The proposed site can be accessed via the Provincial Main Road R22, which is directly from the town of Manguzi. The proposed Mabibi Package WTP can be accessed via the existing D1848 gravel road. Please see below Figure 6 which illustrates the site access.	

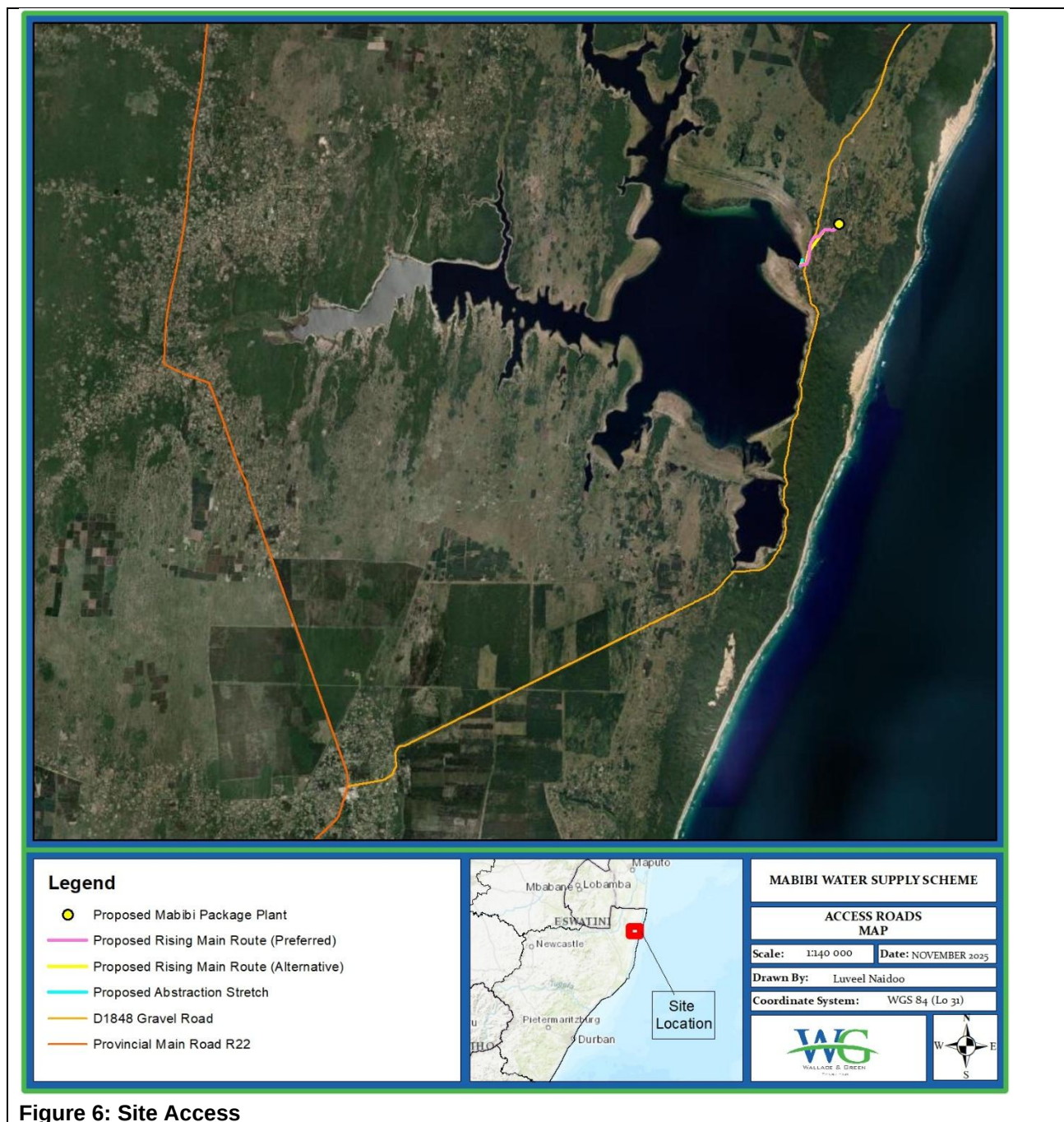


Figure 6: Site Access

1.8 Zoning and Land Use Rights

What is the land currently zoned for? Rural settlement, small-scale subsistence farming and livestock grazing		
Will any person's rights be negatively affected by the proposed activity/ies?	☐	NO
Will the activity be in line with the following?		
The Provincial and Local Spatial Development Framework	YES	☐
The Provincial and Local Integrated Development Framework	YES	☐

The Mabibi Water Supply Scheme has been proposed in direct response to the severe and persistent water supply challenges experienced within the uMhlabuyalingana Local Municipality, under the jurisdiction of uMkhanyakude District Municipality. Currently, many communities within the Mabibi area rely on groundwater abstraction through communal boreholes and house-hold level rainwater harvesting, which are often unreliable,

of poor quality, and insufficient to meet basic domestic demands. Seasonal variability, declining groundwater levels, and increased population pressures have exacerbated the situation, leading to frequent water shortages and significant service delivery backlogs.

The uMngeni-uThukela Water has therefore proposed the Mabibi Water Supply Scheme to regulate potable water supply to the Mabibi community. The project proposes the abstraction of water from Lake Sibayi, which will then be treated at the proposed Mabibi Package Water Treatment Plant, and distributed to the Mabibi community.

This initiative directly supports government objectives of equal access to safe and reliable drinking water, as stipulated in the following:

- Section 27(1)(b) of the Constitution of the Republic of South Africa (Act 108 of 1996), which states that every citizen has the right to sufficient food and water;
- The National Development Plan (NDP 2030), which emphasises equitable water access as a driver for social and economic development; and
- The Strategic Framework for Water Services (2003) and Water Services Act (Act 108 of 1997), which mandate Water Services Authorities to ensure adequate water supply and sanitation for all.

As per the uMhlabuyalingana Local Municipality IDP (2023 – 2025) and the uMhlabuyalingana Local Municipality SDF (2017), the following key development challenges have been identified:

- Inadequate access to potable water and sanitation;
- High poverty and unemployment levels; and
- Limited infrastructure and economic development in rural settlements.

The proposed Mabibi Water Supply Scheme contributes directly to these local objectives by supplying safe drinking water to communities currently dependent on unreliable or unsafe water sources. It introduces critical water services which forms the foundation for broader socio-economic development by providing both infrastructure and job opportunities. Furthermore, the proposed rising main has been designed with a minimal environmental footprint, as it is located along an existing dirt road. The abstraction point will be located within Lake Sibayi however, floating infrastructure will be utilised, with minimal impact on the aquatic environment.

The project addresses a critical basic human need and reinforces the local municipality's spatial vision of sustainable and inclusive development, while taking cognisance of the sensitive ecological environment. The proposed Mabibi Water Supply Scheme will also support public health and wellbeing, and contribute to local socio-economic upliftment.

The uMkhanyakude District Municipality Draft IDP (2023 – 2024) has consistently identified water provision and infrastructure development as priority concerns. The proposed Mabibi Water Supply Scheme aligns with the IDP as it will improve access to basic services such as water and sanitation by providing reliable potable water supply to the Mabibi community, addressing persistent service delivery backlogs. From a socio-economic perspective, the proposed project will uplift the Mabibi community by promoting public health and encouraging tourism linked to the iSimangaliso Wetland Park which will stimulate local economic activity.

The Mabibi Water Supply Scheme aligns with and supports the strategic objectives and development goals in both the local and district municipalities. It strengthens the municipalities' capacity to deliver on their obligation to provide access to basic services, contribute to socio-economic upliftment, and promotes environmentally responsible development.

On a global scale, the proposed project aligns with Goal 6 of the 2030 Sustainable Development Goals (SDG) which states the following: "Ensure availability and sustainable management of water and sanitation for all".

Overall, the proposed Mabibi Water Supply Scheme will address water scarcity, improve health and wellbeing, and meet the growing water demand. Furthermore, it aligns with national and local plans and goals, promotes socio-economic upliftment, and long-term resilience.

1.9 Water Use and Bulk Service Availability

Please indicate the source(s) of water that will be used for the activity.

The proposed Mabibi Package WTP will source water from the Lake Sibayi as a short-term solution. The long-term solution is to connect to the Jozini Dam, following the planned upgrades. The abstraction of water from the Lake Sibayi received Water Use Authorisation (WUA) from the Department of Water and Sanitation (DWS) on the 27th August 2024. The WUA authorised the allocation of 365 000 m³/a from Lake Sibayi to supply the Mabibi Package Plant Water Treatment Works as follows:

- uMkhanyakude District Municipality currently has an allocation of 1 825 000 m³/a under registration number 21121910 to supply water for drinking to the same communities reflected in the application. The District Municipality has an additional allocation of 649 250 m³/a under registration number 21160066 and 21160084 from the same lake for other areas.
- Therefore, DWS indicated that Umngeni – Uthukela Water proceed with the construction of the Mabibi Package Plant Water Treatment Works and abstract water from Lake Sibayi as there is an existing allocation under uMkhanyakude District Municipality.

Based on the above, it is important to note that **NO** new allocation of water from the Lake Sibayi was allocated to the Mabibi Package Plant.

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month.

As per the Water Use Authorisation, an allocation of 365 000 m³/a or 1ML/day will be extracted from Lake Sibayi to supply the Mabibi Package Plant Water Treatment Works.

Does the activity require a water use authorisation (general authorisation or water use license) from the Department of Water & Sanitation? Please provide proof that the application has been submitted to the Department of Water & Sanitation.

Yes, the abstraction of water from the Lake Sibayi received Water Use Authorisation (WUA) from the Department of Water and Sanitation (DWS) on the 27th August 2024.

Please refer to **Appendix I3 – Water Use Authorisation**.

Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development? (Confirmation by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as an Appendix).

The only outstanding service is the confirmation of disposal of the sludge at the Umhlabuyalingana LM. The service agreement will be submitted with the Second Draft Basic Assessment Report.

1.10 Energy Efficiency

Describe the design measures, if any, which have been undertaken to ensure that the activity is energy efficient.

Floating raw water pumpstation:

The pumps in a raw water floating pump station are typically designed to operate at lower power consumption rates compared to traditional pumps, further reducing energy costs. The raw water floating pump station design is often more straightforward than traditional pumping stations, reducing complexity and potential sources of inefficiency.

Package Water Treatment Plant:

Smaller plants are often designed with energy efficiency in mind, incorporating modern technologies and design principles that minimize energy consumption. A 1 ML/d plant typically has a smaller footprint, which means less land is required for construction and maintenance. This can lead to lower energy consumption due to reduced infrastructure needs.

Describe how alternative energy sources have been considered or been built into the design of the activity if any.

Not Applicable.

SECTION 2: SITE DESCRIPTION OF SURROUNDING LAND USE AS PER SECTION 3(H) (IV) AND (K)

2014 NEMA EIA Regulations (as amended), Appendix 1- 3(H) a full description of the process followed to reach the proposed preferred alternative within the site, including (iv) and 3 (K) a summary of findings and impact management measures identified in any specialist report complying with Appendix 6 to these regulations and an indication as to how these findings and recommendations have been included in this report.

2.1. Climate

The climate in the Mabibi area falls within a subtropical climate zone, with hot, humid summer months (October to April) and cool, dry winter months (May to September). Temperatures can reach 36°C in summer and drop to 10°C in winter. The project area experiences an average temperature range varied between 22°C for cooler year, 23°C for an average year, and 24°C for warmer year. Furthermore, the Mabibi area is a wet region, with high rainfall during the summer months.

As per the Climate Change Impact Assessment, dated September 2025, the eastern part of Lake Sibayi experiences less precipitation whereas the western part of Lake Sibayi experience 24mm more precipitation. However, currently Lake Sibayi is experiencing a warm scenario and the precipitation for the whole area has reached above 30mm. The water balance for Mabibi was observed through the use of climate model projections. The model projections indicated that there was no change in the water table for the area around Lake Sibayi, which illustrates that as mean global temperatures rise, the Mabibi area wetness/dryness conditions will not change relative to the historical norm.

As per the Climate Change Assessment, dated September 2025 it has been noted that Lake Sibayi will most likely be impacted through overuse of water source which might negatively impact the aquatic ecosystem and fluctuate water levels.

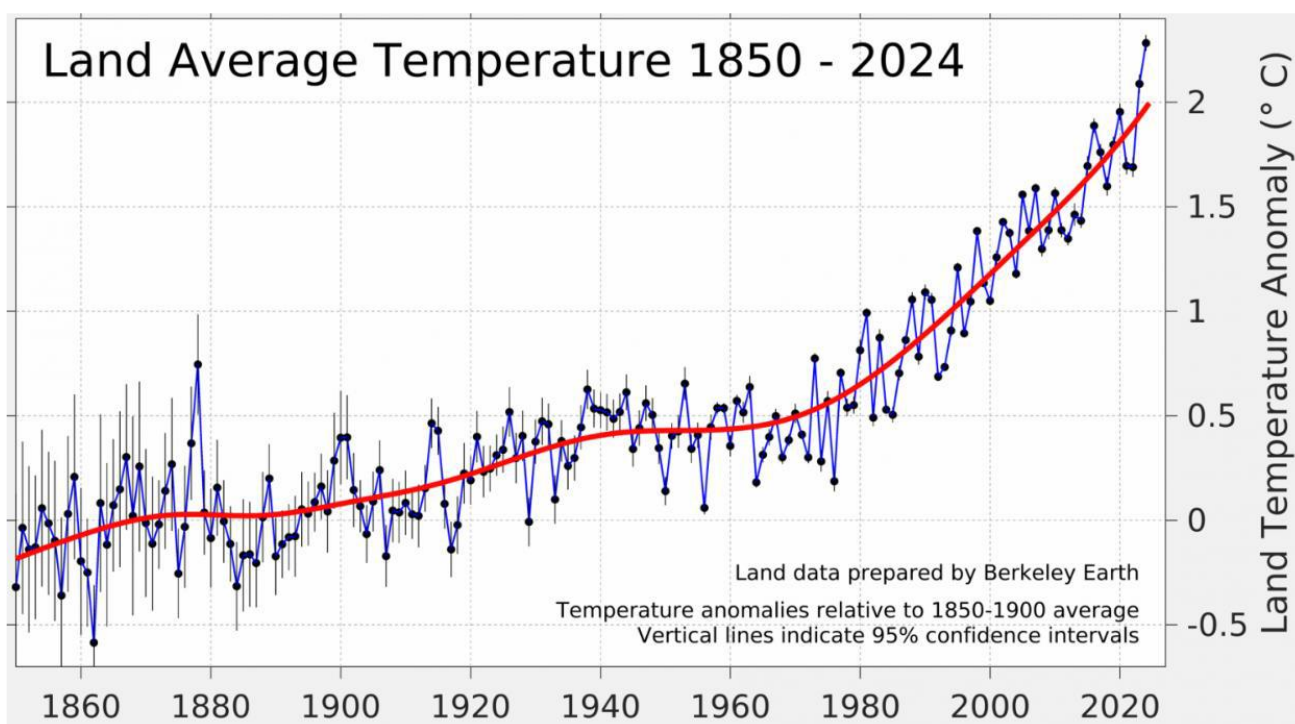


Figure 7: Average annual temperature (1850 – 2024)

2.2. Geology and Soils

As per the Terrestrial Biodiversity Assessment, dated July 2024, the most predominant geology feature is Cenozoic sediments which comprises a 1-20 km wide band of Cretaceous age rocks and is further subdivided into the Mzinene formation which consists of a siltstone with shelly concretionary layers. These soils are anticipated to extend to depths greater than 25 metres below existing ground level and is characterised by the presence of a shallow water table. The geology of the area is characterised essentially by glauconitic siltstone that were deposited during the Cretaceous age.

The proposed site is underlain by Quaternary age unconsolidated aeolian sediments of the Berea Formation. Inspection pits were excavated on site by Geosure (Pty) Ltd in April 2024, whereby sandy fill as well as deposits of alluvium, colluvium and the Berea formation were profiled on site. These materials are susceptible to rapid erosion by uncontrolled stormwater runoff that potentially may lead to severe erosion. As per the Geotechnical Investigation conducted by Geosure (Pty) Ltd, dated April 2024, potentially unstable sidewalls were noted on site. Despite the subsurface characteristics, there are no signs of inherent ground instability such as slip scars, tension cracks, sinkholes or major sloughing within the soils when the project area was being profiled.

2.3. Topography and Biophysical Environment

The general region of the proposed Mabibi Water Supply Scheme is located within the Maputaland Coastal Belt vegetation type and the Indian Ocean Coastal Belt biome. The development footprint falls within an area of Very High sensitivity for terrestrial and aquatic features due to the development footprint being located within Lake Sibayi Freshwater Reserve, and the Coastal Forest Reserve. These Reserves are part of the iSimangaliso Wetland Park that was designated as a World Heritage Site in 2000.

As per the Terrestrial Biodiversity Assessment, dated July 2024, the majority of the proposed rising main traverses elevated former dune slopes which now resemble hillsides. It must be noted that the proposed rising main has been designed with a minimal environmental footprint, as it is located along a previously disturbed existing dirt road. Slopes within Mabibi and Lake Sibayi are generally mild to moderately steep. The proposed abstraction pipeline is located along the eastern low-lying edge of Lake Sibayi where mild slopes to the west prevail. The proposed Mabibi Water Treatment Works is located on an upper hillside paleo dune with gentle to moderate slopes in a south-easterly direction.

2.4. Terrestrial Biodiversity Compliance Statement

The Terrestrial Assessment was conducted by Rautenbach Biodiversity Consulting, dated July 2024. The findings of the assessment are summarised below:

- The development footprint falls within an area of Very High sensitivity for terrestrial and aquatic features due to the location of the development footprint being located within Lake Sibayi Freshwater Reserve, and the Coastal Forest Reserve. These Reserves form part of the iSimangaliso Wetland Park that was designated as a UNESCO World Heritage Site in the year 2000.
- Additional sensitivities included the location of the development footprint within CBA and ESA areas and in an Endangered ecosystem type. Aquatic features highlighted included the location of the development footprint in a FEPA sub catchment, and the presence of coastal wetlands of the Indian Ocean Coastal Belt bioregion.

Figure 8 illustrates Protected and Conservation areas in relation to the project area, and **Figure 9** illustrates the CBA in relation to the project area.

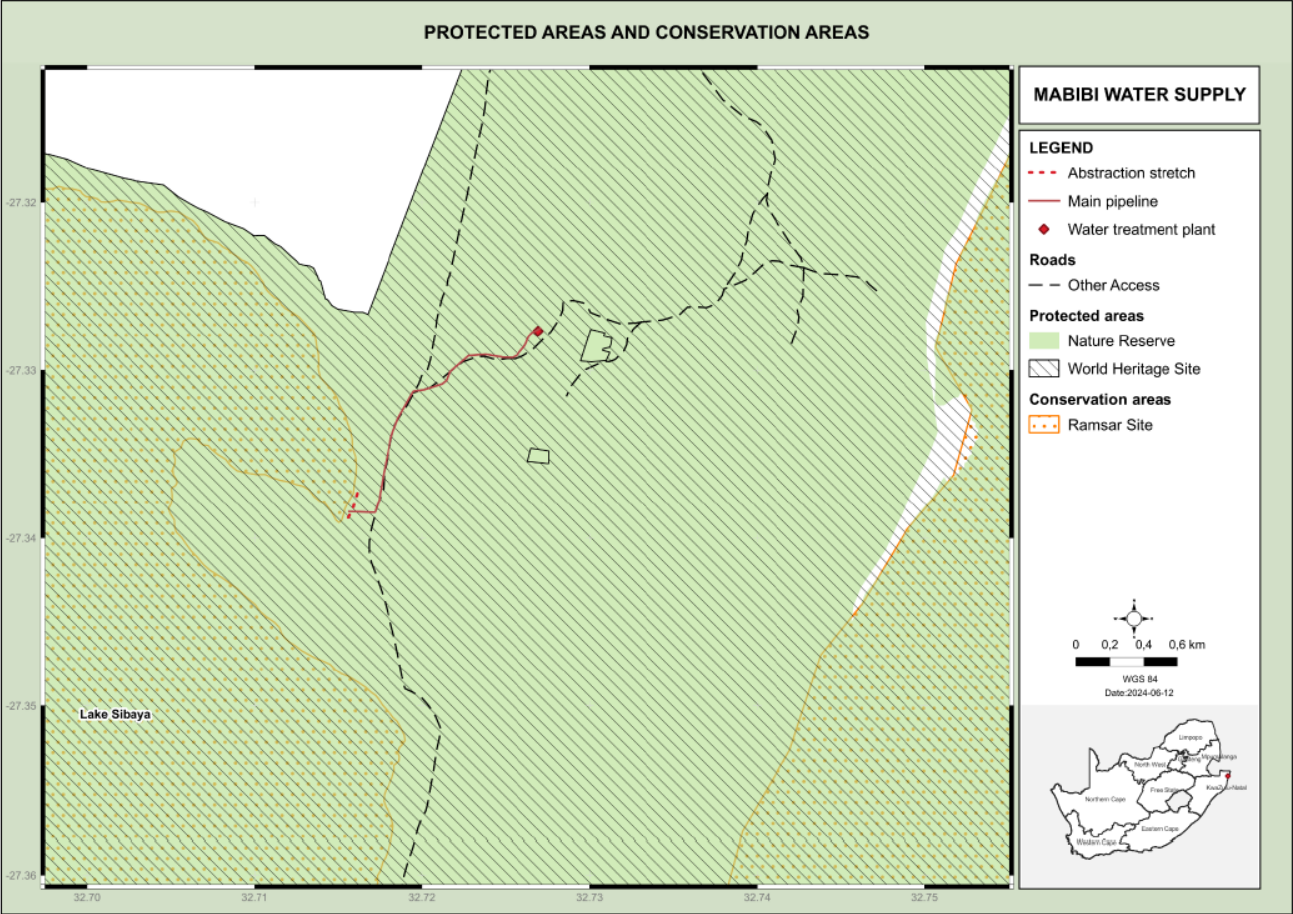


Figure 8: Protected and Conservation areas in relation to the project area

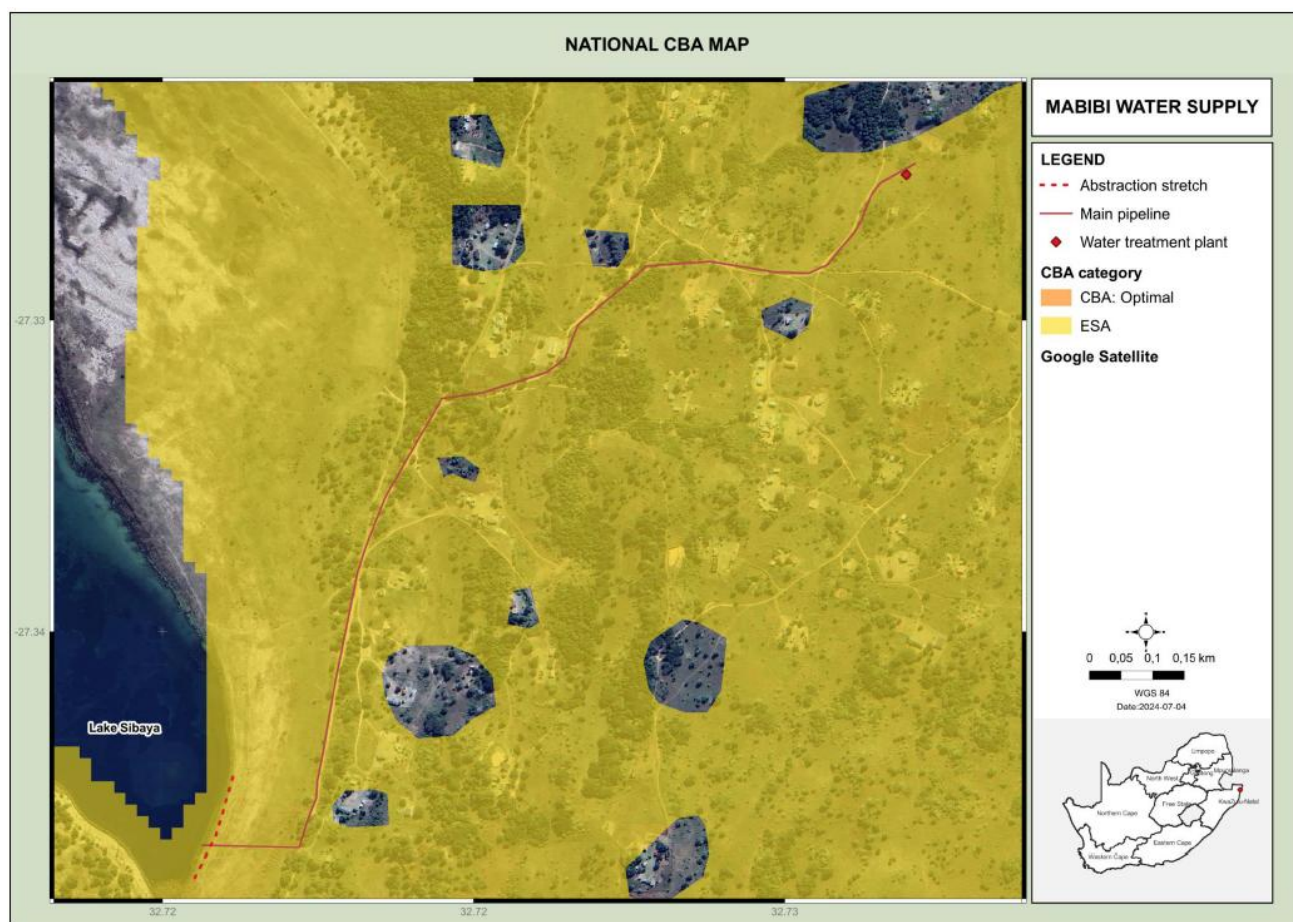


Figure 9: Critical Biodiversity Areas in relation to the site

- During the site verification, it was noted that the vegetation within the development footprint is moderately modified, however the ecological function is largely maintained.
- SCC flora species confirmed to be present included 13 individuals from Red Listed species *Freesia laxa* subsp. *azurea* (VU), several individuals from the tree species *Sclerocarya birrea* that is protected under the National Forest Act, and one (1) individual each of the following provincially protected species: *Crinum stuhlmannii* and *Dioscorea cotinifolia*.
- *F. laxa* subsp. *azurea*'s estimated area of occupancy is 176 km² and is known from only 10 remaining locations. No further habitat loss of the species should therefore be permitted as the species' status will immediately become either Endangered or Critically Endangered.
- The following species are listed as of Least Concern in the Red List of South African Plants.
 - *S. birrea*;
 - *C. stuhlmannii*; and
 - *D. cotinifolia*.
- The removal of these species will be subject to permit authorisation from the relevant authorities.
- Red Listed flora species listed as potential occurrences included: -
 - Three (3) species listed as endangered:
 - *Oxygonum dregeanum* subsp.;
 - *Streyi*, *Nidorella tongensis*; and
 - *Thesium vahmeijeri*.
 - Seven (7) species listed as Vulnerable:
 - *Sclerochiton apiculatus*;

- *Pachycarpus concolor*. subsp.;
- *Arenicola*;
- *Disperis woodie*;
- Sensitive species 1221;
- *Restio zuluensis*; and
- Sensitive species 191,
- One (1) species listed as Near Threatened
 - *Crinum acaule*),
- Two (2) species listed as Rare
 - *Searsia kwazuluana*; and
 - *Panicum sancta-luciense*.
- SCC fauna confirmed to be present included the following Red Listed species:
 - *Ephippiorhynchus senegalensis* (Saddle-billed Stork) listed as Endangered;
 - *Macronyx ameliae* (Rosy-throated Longclaw) listed as Near Threatened; and
 - *Crocodylus niloticus* (Crocodile) listed as Vulnerable.
- *C. niloticus* and *E. senegalensis* are restricted to aquatic habitats (i.e., Lake Sibayi) and both species are occasionally observed in the vicinity of the proposed abstraction stretch. The project area and adjacent habitats are likely used by both species for foraging/resting habitats since suitable nesting sites for these species are not present. It is therefore unlikely that the proposed development will have a significant impact on the species as they will simply move away from the area following disturbance.
- *M. ameliae* is occasionally observed in the hygrophilous grassland next to Lake Sibayi, close to the abstraction stretch and the proposed rising main. It is a ground nesting species and nests are constructed in thick grass accessed by a short passageway. Vegetation clearance and the subsequent construction phase activities can be highly disturbing to ground-nesting bird species breeding in the vicinity of the activities. Many birds are highly susceptible to disturbance, and should this disturbance take place during a critical time in the breeding cycle, it could lead to temporary or permanent abandonment of the nest or premature fledging. In both instances, the consequences are almost invariably fatal for the eggs or the fledglings.
- Additional SCC fauna species confirmed to be present included *Hippopotamus amphibius* (Hippopotamus), *Ardea purpurea* (Purple Heron) and *Bubulcus ibis* (Western Cattle Egret). These species have a Red List status of 'Least Concern' but is protected under provincial legislation. *H. amphibius* also appear under CITES Appendix II. It is unlikely that the species will be significantly affected by the proposed development as they would simply move to more suitable habitat following disturbance.
- The study noted various Potential Occurrences for the project area. The precautionary approach is to assume that all species listed as potential occurrences are present until its presence/absence can be verified during targeted searches.
- Owing to the location of the development footprint within the iSimangaliso Wetland Park, in an Endangered ecosystem type and the presence and potential occurrence of several Red Listed fauna and flora species, the development footprint is regarded as of High ecological importance, and Lake Sibayi as of Very High ecological importance.
- From a terrestrial biodiversity perspective, the development is supported provided that mitigation measures are implemented and incorporated into the Environmental Management Programme and Environmental Authorisation.

Figure 10 illustrates the threatened terrestrial ecosystems in relation to the proposed site.

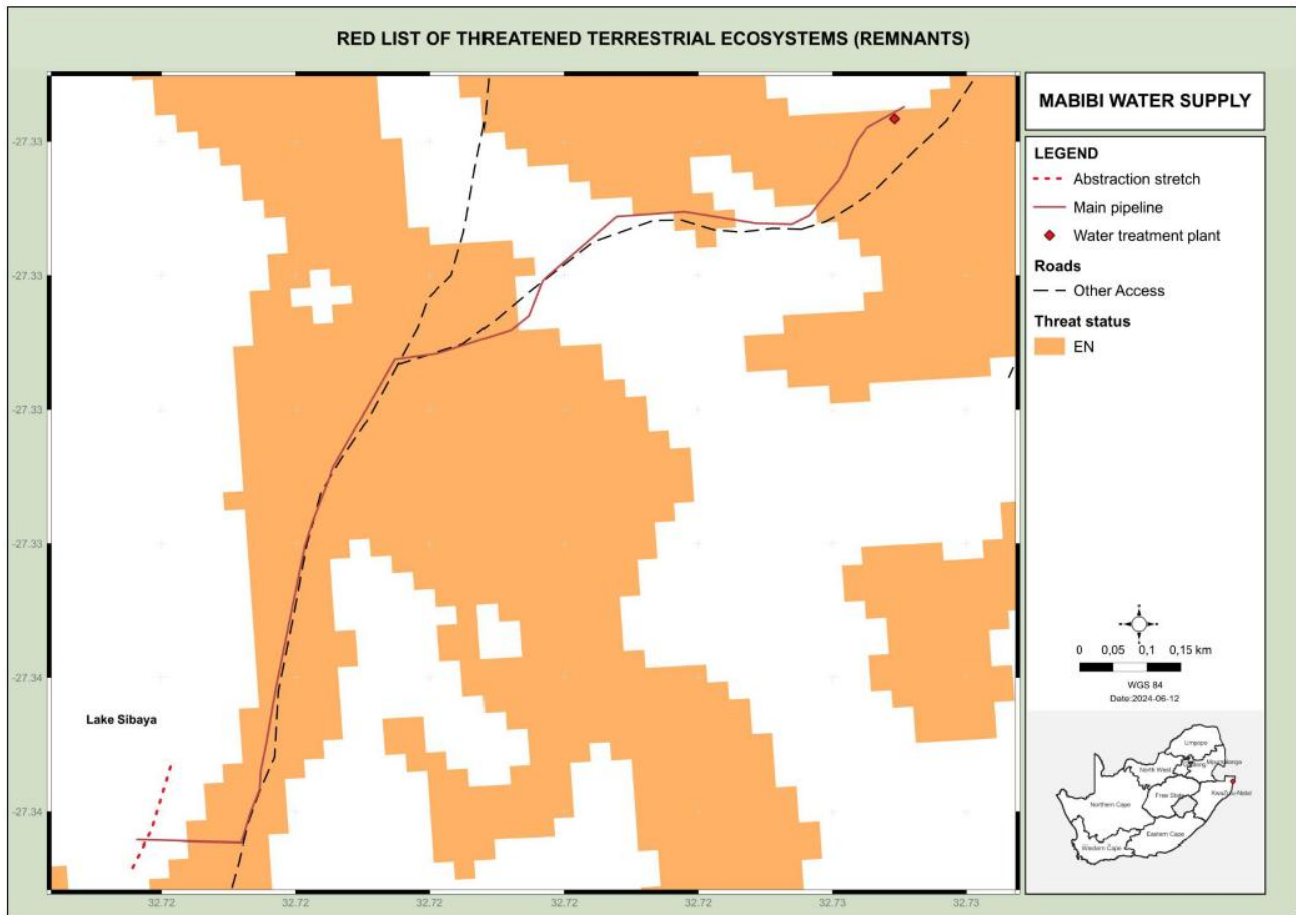


Figure 10: Threatened terrestrial ecosystems in relation to the site

Please refer to **Appendix D2 - Terrestrial Biodiversity Assessment**

2.5 Agricultural Compliance Statement

An Agricultural Assessment was conducted by Eco-Assist Environmental Consulting, dated April 2024. The findings are summarised below:

- Spatial analyst terrain analysis tools were used to determine the Digital Elevation Model (DEM). The project area features an undulating landscape characterised by varying dunes, with elevations ranging from 18 to 38 meters above sea level (masl). The general drainage direction is towards Lake Sibayi to the west.
- The terrain capability for the project area ranged from Moderate-Low to Moderate-High.
- The proposed project falls within two (2) land type units, which are Hb52 and Hb54, along the western and eastern boundary of the project are respectively. The Hb52 land type is dominated by the valley bottom landscape positions which consists mainly alluvium with blown sand and calcareous sand, and small areas of red dune cordon sand of the Bluff Formation, whereas Hb54 land type is dominated by midslope landscape position and consists mainly of yellowish redistributed sand with red dune cordon sand of the Berea Formation and blown sand.
- The project area is dominated by very sandy horizons with varying degrees of wetness within the profiles. The wetness indicators closely match the low points within the rolling dune landscape. The wetter portions were classified as Westleigh and Longlands soil forms. With the raised areas being classified as Clovelly and Fernwood soil forms.

- The assessment determined that the agricultural potential is dominated by non-arable soils. There are some isolated areas of Good potential, however these are not feasible for significant agricultural uses.
- The project is supported as the sensitivity of the project, which was valued “Medium to High” as per the DFFE screening tool, was disputed to have a “Medium to Low” sensitivity.

Figure 11 illustrates the soil delineation along the proposed rising main and **Figure 12** below illustrates the agricultural sensitivity along the proposed rising main.

Please refer to **Appendix D1 – Agricultural Compliance Statement**

AGRICULTURAL ASSESSMENT FOR MABIBI WSS - SOIL DELINEATION

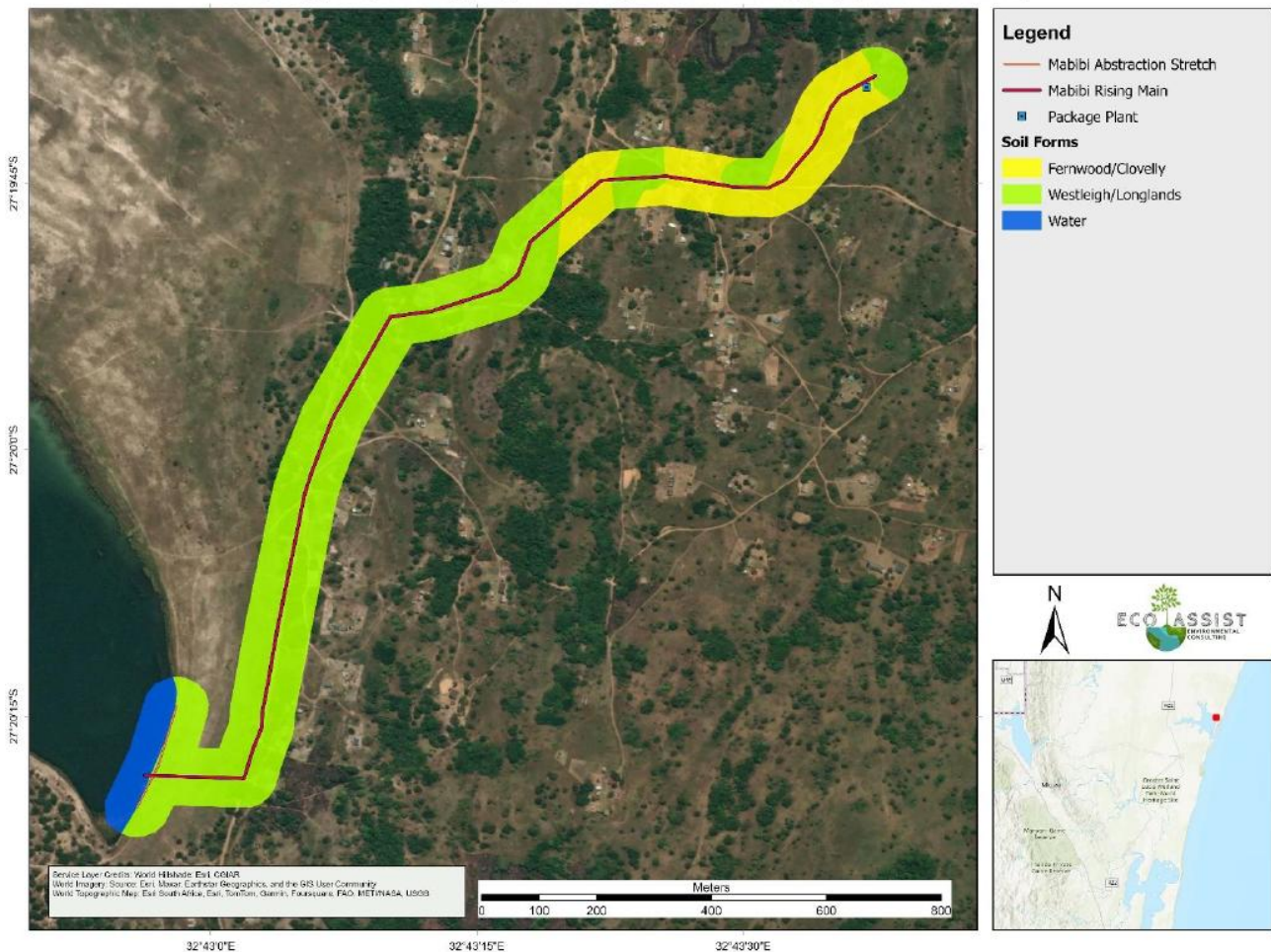


Figure 11: Soil delineation along the proposed development.

AGRICULTURAL ASSESSMENT FOR MABIBI WSS - SENSITIVITY ANALYSIS

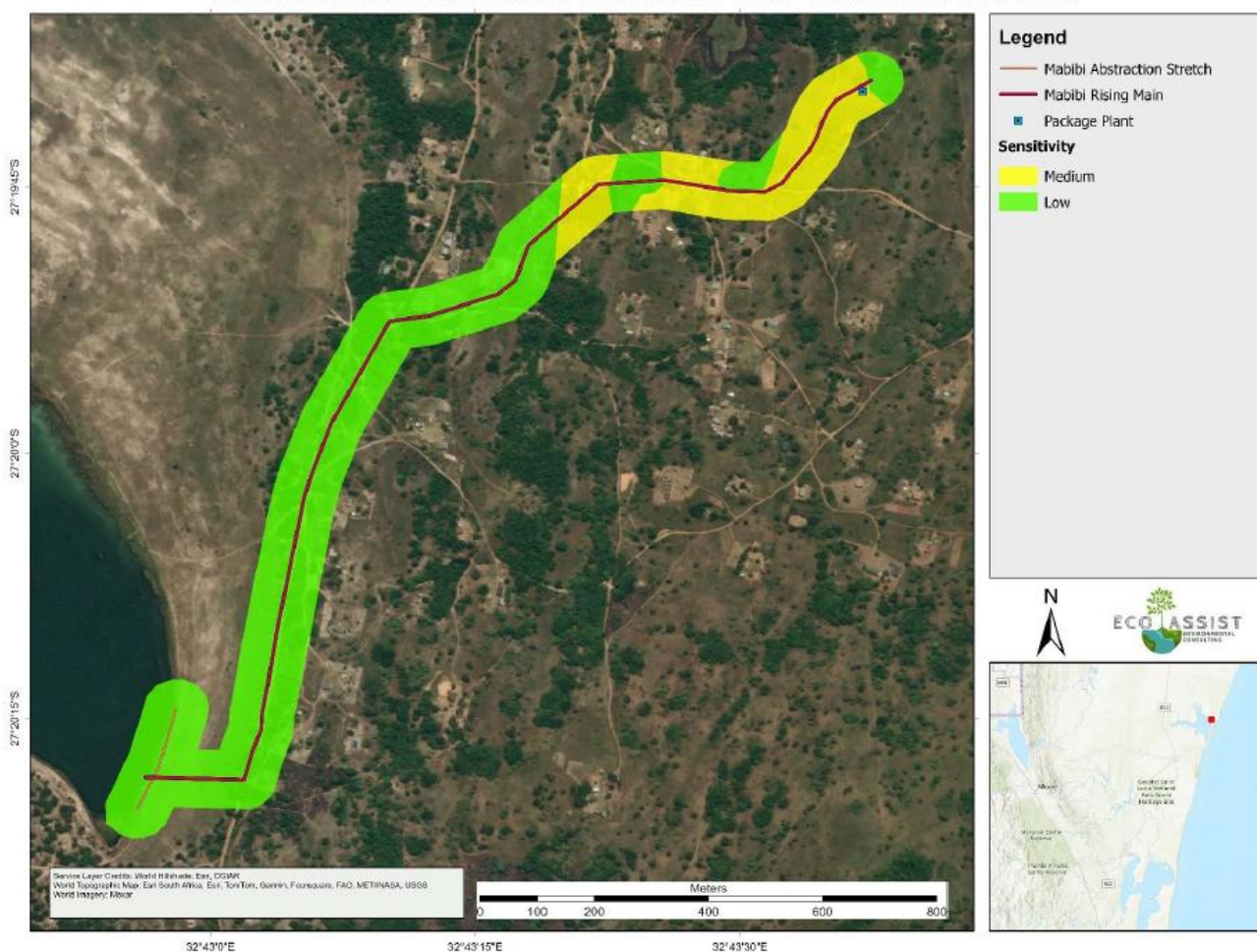


Figure 12: Agricultural sensitivity analysis along the proposed development.

2.6 Wetland Delineation and Functional Assessment

The Wetland Delineation and Functional Assessment was undertaken by The River Guy, dated September 2025. The findings of the assessment are summarised below:

- The proposed project area falls within the iSimangaliso Strategic Water Resource Area and is located within an unnamed Sub-Quaternary Catchment area.
- The unnamed Sub Quaternary Catchment is rated largely modified with a moderate ecological importance and very high ecological sensitivity.
- Three (3) HGM units were identified in close proximity to the project area, which are valley floor wetlands. These wetlands appear unaltered and are still in a natural state despite the presence of informal gravel roads and the subsistence farming undertaken by the surrounding rural settlements.

Figure 13 illustrates the valley floor wetlands in relation to the site.

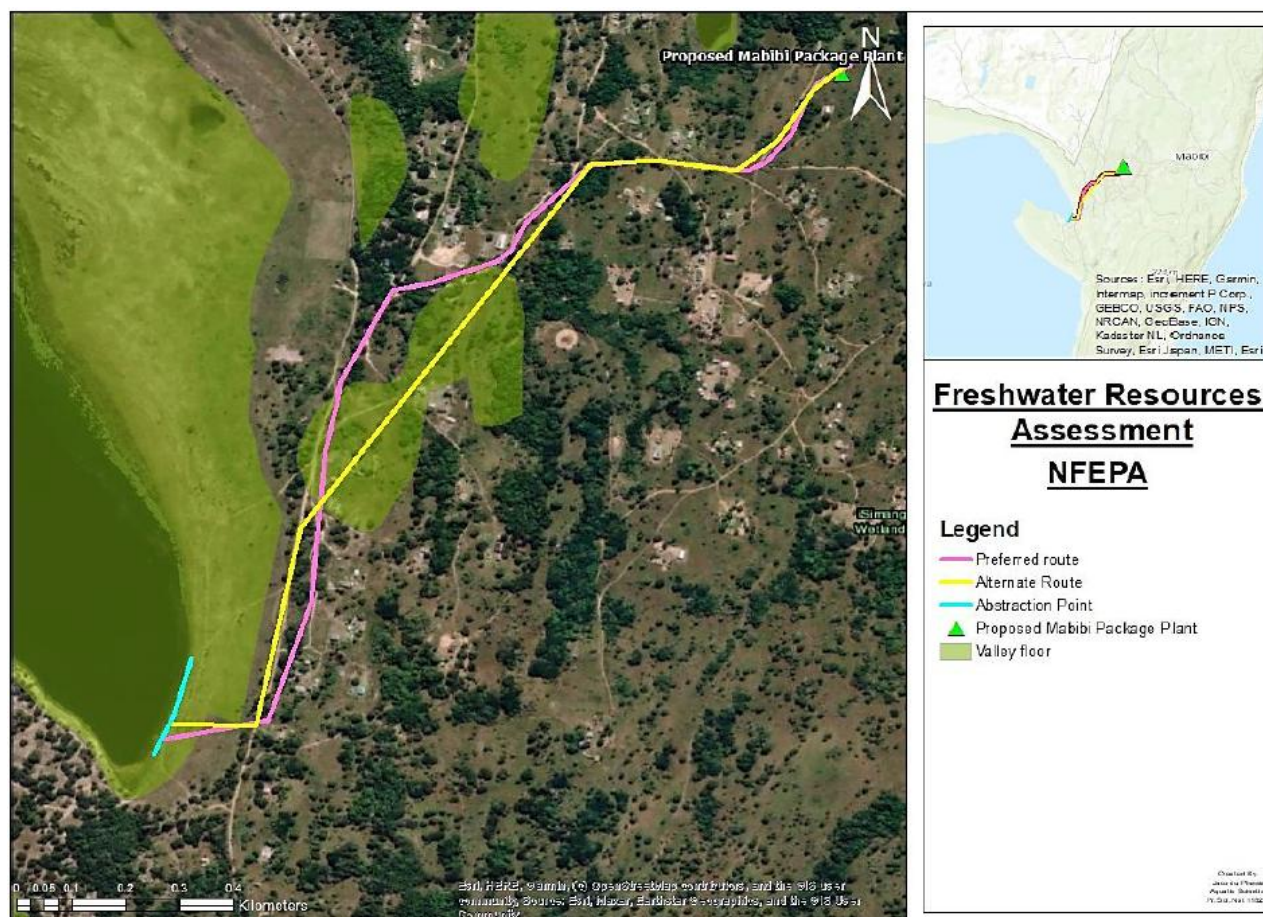


Figure 13: Valley floor wetlands in relation to the site

- The vegetation type associated with the project area is the Maputaland Coastal Belt (CB1) which is rated Vulnerable by Mucina and Rutherford (2012).
- The in-situ water quality does not go beyond the acceptable limits defined by the Department of Water and Sanitation for healthy aquatic ecosystems.
- Slightly elevated electrical conductivity and total dissolved solids were observed at the time of sampling. This is likely due to the coastal location of Lake Sibayi and not due to any adverse impacts.
- It is recommended that surface water monitoring should be undertaken bi-annually to establish measurements within Lake Sibayi. It is however likely that these measurements are due to the natural geology of the area.
- Based on the taxa sensitivities observed, taxa ranged from semi-tolerant to tolerant, indicating species that are buffered/acclimated to changes in physio-chemical changes.
- Based on the habitat observed at the point of abstraction, potential presence of the endangered *Silhouettea sibayi* (Sibayi Gobi) is deemed likely as it is considered niche habitat for the species.
- No surface water was observed within these systems, which likely indicates that the systems only act as a natural flow path during times of rain.
- Overall, the valley floor wetlands appear to be unaltered and in a natural state however several informal gravel roads are around the fringes of the observed depressions.
- The Present Ecological State (PES) of the site is “Largely Modified” with an Ecological Importance of “Moderate”. This is a result of anthropogenic impacts (i.e. establishing roads, subsistence farming, rural settlements) and clearing of vegetation.

- The path of the preferred route, although traversing the buffer slightly, is deemed to be the better option as it follows the established gravel road, and is not deemed to have an impact on the associated system. The alternate route should not be considered as it traverses the system.
- The development is supported provided that mitigation measures are implemented and adhered to, which will be considered favourable due to the water challenges experienced on site.

Please refer to **Appendix D4 – Wetland Delineation and Functional Assessment**

2.7 Heritage Impact Assessment and Desktop Paleontological Assessment

A Heritage Impact and Desktop Paleontological Impact Assessment was conducted by Land Matters Environmental Consulting, dated July 2024. The findings of the assessment are summarised below:

- As per the Desktop PIA, the project site is underlain by Quaternary-aged Aeolian sands of the Berea Formation, Maputaland Group.
- Two grave sites were identified near the project area as illustrated in **Figure 14** below.
- Grave 1 is located at GPS coordinates 27°19'46.78"S and 32°43'29.82"E and comprises a modern grave with headstone. The grave belongs to Zandile Nhlozi and is less than 60 years old. The grave is located approximately 48m to the south of the bulk water pipeline route. Refer to Photograph 1 below.
- Grave 2 is located at GPS coordinates 27°19'47.11"S and 32°43'29.88"E and comprises an older structure, constructed out of concrete, with headstone. There is however no inscription on the headstone. Refer to Photograph 2 below.

	
Photograph 1: View of Grave 1 identified on site.	Photograph 2: View of Grave 2 identified on site.

- It is recommended that both of the identified graves be left in-situ on the site. More specifically, a minimum of a 15m no-development buffer is recommended around the boundary of each grave. The final bulk water pipeline servitude must be aligned to avoid both of the grave sites, including the 15m no-development buffer.
- The heritage consultant is in support of the development provided that mitigation measures are implemented during the construction and operation phases of the development.



Figure 14: Google earth imagery of the two (2) identified grave sites in relation to the site

Please refer to **Appendix D7 – Heritage Impact Assessment**

2.8 Geotechnical Considerations

The Geotechnical Assessment was undertaken by Geosure (Pty) Ltd, dated April 2024. The findings of the assessment are summarised below:

- The project is generally stable and underlain by minimal fill material, and deposits of colluvium, alluvium, and aeolian soils.
- Groundwater concentrations were identified at 5 tests pits (IP1, and IP15 – IP 18), with well-developed groundwater conditions. This is attributed to the proximity to Lake Sibayi.
- An intermittent perched groundwater condition may be encountered during construction, especially after heavy rainfall events.
- Samples of aeolian material meets the requirements for Select Fill which can be used when backfilling for the proposed rising main. Aeolian deposits must undergo laboratory verification.
- Foundations placed on the collapsible, loose colluvial, alluvial, and aeolian soils are likely to undergo excessive settlement and potential experience bearing capacity failure even under light to moderate loads.
- The site is generally stable and suitable for the proposed development, provided the geotechnical recommendations are adhered to.

Please refer to **Appendix D6 – Geotechnical Investigation**

2.9 Groundwater Assessment

The Groundwater Assessment was undertaken by Terratest, dated September 2024. The findings of the assessment are summarised below:

- The proposed project area falls within the W70 Quarternary Catchment which is underlain by Cretaceous age Siltstone at depth which have a medium to coarse grained sand layers.
- The project area receives a mean annual precipitation 0.716 m/a and requires a recharge demand of 78.15mm/a.
- A hydrocensus survey of the existing resources was carried out for the project area in order to establish the groundwater use and potential borehole yield in the project area. Two (2) boreholes were identified 1.64km east from the project area and these boreholes are in use by the surrounding community.
- The results of analysis indicate that the acute health limits are exceeded for E. coli in selected boreholes and the chronic health limits are exceeded for aluminium, arsenic, iron and manganese in selected boreholes.
- The aesthetic limits are exceeded for colour, turbidity, ammonia, iron and manganese in selected boreholes.
- The operational limits are exceeded for total coliforms, plate counts, and turbidity in selected boreholes.
- Thus, the borehole water is not suitable for human consumption without treatment.

Please refer to **Appendix D5 – Groundwater Assessment**

2.10 Floodline Assessment

A Floodline Assessment was conducted by Pink Africa Consulting Engineers, dated August 2024. The findings of the assessment are summarised below:

- The rainfall station, Mbazwane, was utilised to adopt 24-hour design rainfall depths for different return periods for the proposed development. It is indicated that the proposed development is subjected to intense high-depth storm events within a 24-hour period, i.e. 103.7 mm of rain accumulates over a 2-year return period and 471.3mm within a 100-year return period.
- A flood level analysis was conducted for the proposed development utilising 1:10 year, 1:50 year and 1:100-year recurrence for the estimated peak flows. The results indicate that the highest peak flow will be experienced in the 1:100-year interval with a value of 2088.60mm.
- The resulting flood lines and flood levels are confined within the embankments of Lake Sibayi and therefore will not affect the proposed project area.
- It is the opinion of the specialist that the development will have a minimal impact upstream and downstream of the watercourse.

Please refer to **Appendix D8 – Floodline Assessment**

2.11 Climate Change Impact Assessment

Climate change is already a measurable reality and along with other developing countries, South Africa is especially vulnerable to its impacts. The National Climate Change Response Plan White Paper (2011) presents the South African Government's vision for an effective climate change response and the long-term, just transition to a climate-resilient and lower-carbon economy and society. South Africa's response to climate change has the following two objectives:

- Effectively manage inevitable climate change impacts through interventions that build and sustain South Africa's social, economic and environmental resilience and emergency response capacity.
- Make a fair contribution to the global effort to stabilise greenhouse gas (GHG) concentrations in the atmosphere at a level that avoids dangerous anthropogenic interference with the climate system within a timeframe that enables economic, social and environmental development to proceed in a sustainable manner.

This response is guided by the Draft Guideline for Consideration of Climate Change Implications in applications for Environmental Authorisations, Waste Management Licenses and Atmospheric Emission Licenses (2021). It must be noted that the proposed development activity will most likely be impacted upon by climate change due to the following reasons:

- Extreme weather conditions.
- Release of emissions from the construction vehicles.

However, the impacts of climate change on the activity may be avoided by means of the following measures:

- Once construction is complete, rehabilitation and landscaping will be undertaken with indigenous vegetation.
- The impacts associated with the construction vehicles will be mitigated against the site-specific EMPr.

A Climate Change Assessment was undertaken by Bluegreen Environmental Consultants, dated September 2025. The findings of the assessment are summarised below:

- The project site falls within a tropical climate zone and it experiences an average temperature of 18°C or higher along with the timing of seasonal rains.
- The project site experiences an average temperature range varied between 22°C for cooler year, 23°C for an average year, and 24°C for warmer year.
- The eastern part of Lake Sibayi experiences less precipitation whereas the western part of Lake Sibayi experiences more precipitation by 24mm. However, currently Lake Sibayi is experiencing a warm scenario, the precipitation for the whole area has reached above 30mm.

The water balance for Mabibi was observed through the use of climate model projections at a 1°C and 1.5°C increase. The model projections indicated that there will be no change in the water table for the whole area around Lake Sibayi, which illustrates that as mean global temperatures rise, the Mabibi area wetness/dryness conditions will not change relative to the historical norm. **Figure 15** and **Figure 16** illustrate the climate model projections at a 1°C and 1.5°C increase, respectively.

- As per the climate change assessment, it has been noted that the water source, Lake Sibayi, will most likely be impacted through overuse of water source which might negatively impact the aquatic ecosystem and fluctuate water levels.
- It is in the opinion of the specialist that the proposed development is supported as the climate change impacts that will be experienced on site will not hinder the operation of the proposed development.

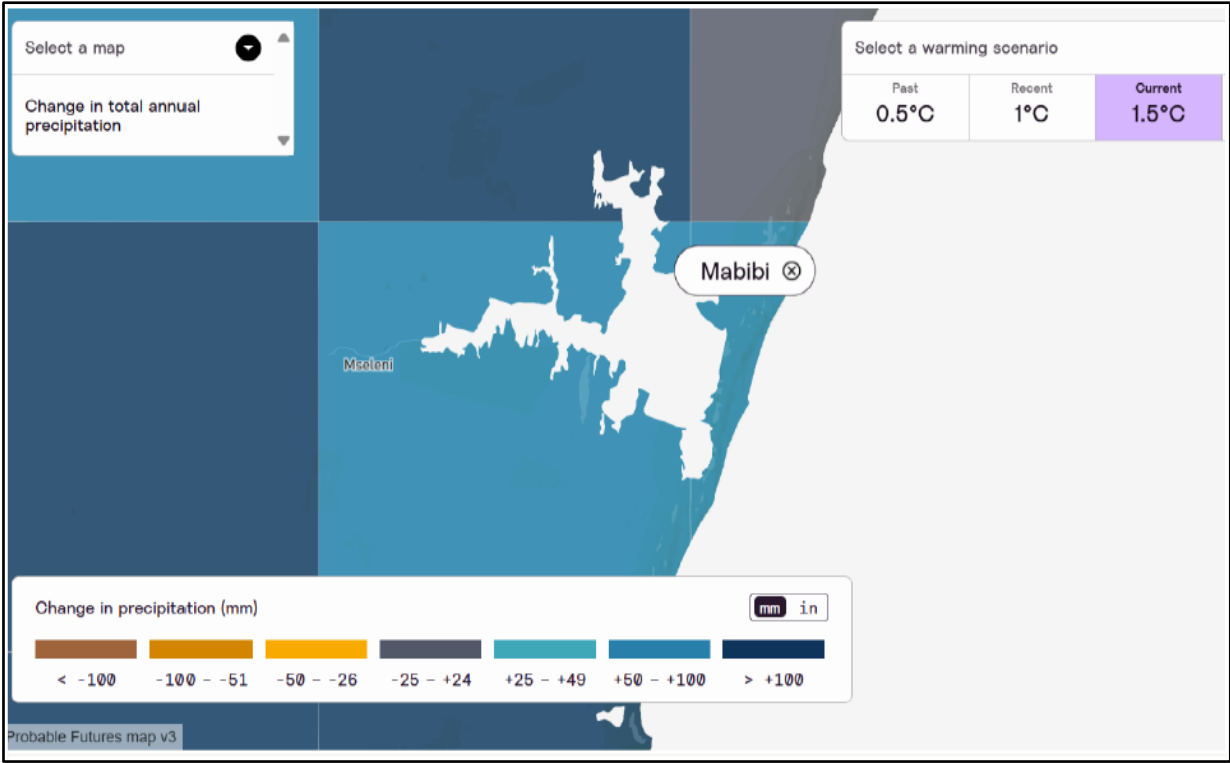


Figure 15: Climate model projection showing the change in total annual precipitation at 1°C warming scenario

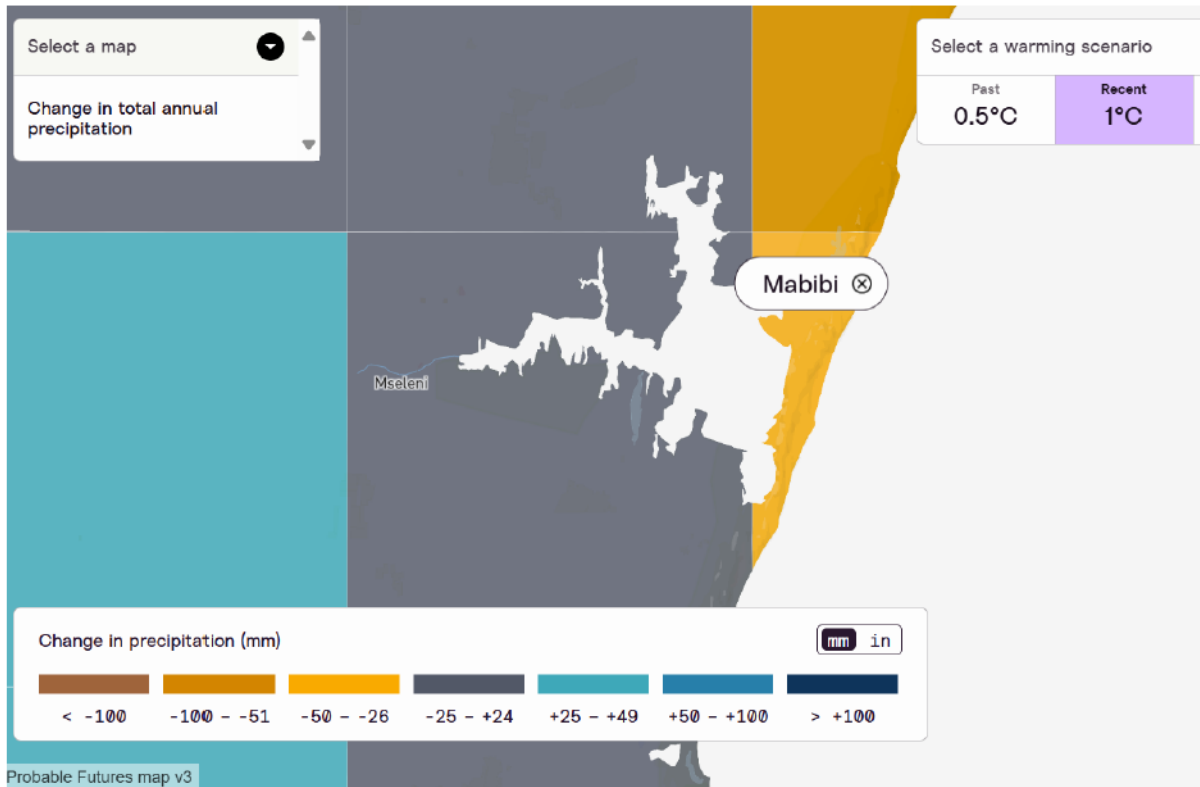


Figure 16: Climate model projection showing the change in total annual precipitation at 1.5°C warming scenario

Please refer to **Appendix D – Climate Change Impact Assessment**

2.12. Cultural / Historical Features

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including archaeological or paleontological sites, on or within 20m of the site?	YES	☒
If YES, contact a specialist recommended by AMAFA to conduct a heritage impact assessment. The heritage impact assessment must be attached as an appendix to this report.		
Please refer to Appendix D7 – Heritage Impact Assessment and Desktop Paleontological Assessment		
Briefly explain the recommendations of the specialist:	As per the Heritage Impact Assessment compiled by Land Matters Environmental Consulting, dated July 2024, it is recommended that both of the identified graves be left in-situ on the site. A minimum of 15m no-development buffer zone must be implemented around the boundary of each grave. The proposed rising main servitude must be aligned to avoid both of the grave sites, including the 15m no-development buffer.	
Will any building or structure older than 60 years be affected in any way?	☒	NO
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?	☒	NO
If YES, please submit the necessary application to AMAFA and attach proof thereof to this report.		
N/A		

2.10. Socio-economic Environment

Anticipated CAPEX value of the project on completion	R43 138 000,00
Expected annual turnover to be generated by or as a result of the project	R0,00
New skilled employment opportunities created in the construction phase of the project	10
New skilled employment opportunities created in the operational phase of the project	3
New un-skilled employment opportunities created in the construction phase of the project	15
New un-skilled employment opportunities created in the operational phase of the project	1
Expected value of the employment opportunities during the operational and construction phase	R1 080 000,00

2.11. Surrounding Environment and Land Uses

Cross the land uses and/or prominent features that currently occur within a 500m radius of the site and give a description of how this influences the application or may be impacted upon by the application:

The study area for this project includes the area which will be directly impacted by the project footprint of the proposed Mabibi Water Supply Scheme.

Land use character	YES or NO		Description
Natural area	YES	☒	The project area is located within iSimangaliso Wetland Park, adjacent to Lake Sibayi, with the proposed abstraction point floating within the watercourse.
Low-density residential	YES	☒	Low-density residential units are located adjacent to the proposed rising main.
Medium-density residential	☒	NO	
High density residential	☒	NO	
Informal residential	YES	☒	Informal residential units are located southwest of the proposed rising main.
Retail commercial & warehousing	☒	NO	
High Impact Industrial	☒	NO	
Power station	☒	NO	
Office/consulting room	☒	NO	
Military or police base/station/compound	☒	NO	
Spoil heap or slimes dam	☒	NO	
Quarry, sand or borrow pit	☒	NO	

Land use character	YES or NO		Description
Dam or reservoir	☒	NO	
Hospital/Medical Centre	YES	☒	Mabibi Clinic is situated approximately 370m east of the proposed water treatment plant.
School/ crèche	YES	☒	Mabibi Primary School is situated approximately 300m southeast of the proposed water treatment plant.
Tertiary education facility	☒	NO	
Church	☒	NO	
Old age home	☒	NO	
Sewage treatment plant	☒	NO	
Train station or shunting yard	☒	NO	
Railway line	☒	NO	
Major road (4 lanes or more)	☒	NO	
Airport	☒	NO	
Harbour	☒	NO	
Sport facilities	☒	NO	
Golf course	☒	NO	
Polo fields	☒	NO	
Filling station	☒	NO	
Landfill or waste treatment site	☒	NO	
Plantation	☒	NO	
Agriculture	☒	NO	
River, stream, or wetland	YES	☒	The proposed project is located within and adjacent to Lake Sibayi.
Nature conservation area	YES	☒	The project area is located within Lake Sibayi Freshwater Reserve, and the Coastal Forest Reserve. Both of which are located with iSimangaliso Wetland Park.
Mountain, hill, or ridge	☒	NO	Slopes within Mabibi and Lake Sibayi are generally mild to moderately steep
Museum	☒	NO	
Historical building	☒	NO	
Protected Area	YES	☒	The project area is located with an ESA and iSimangaliso Wetland Park which is a UNESCO-listed wetland reserve.

Land use character	YES or NO		Description
Graveyard	YES	☒	Two graves have been identified within 500m of the proposed development.
Archaeological site	☒	NO	
Other land uses (describe)	☒	NO	

2.12. Nuisance Considerations

Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?	YES	☒
If yes, what estimated quantity will be produced per month?	Approximately 5m ³	
How will the construction solid waste be disposed of? (describe)		
❖ Waste hierarchy would be applied when managing construction waste. The first objective will be to reuse and recycle as much waste as possible and whatever cannot be reused or recycled will be disposed of at one of the registered licensed landfills. ❖ Waste skips/bins will be provided throughout the working servitude with separate skips/bins made available for construction debris and solid waste. The waste will be recycled or reused whenever possible, and the rest disposed to the registered waste. Small amounts of hazardous waste such as discarded oil or grease may be generated on-site. Hazardous waste will be disposed of at an appropriately licensed and registered hazardous waste disposal facility. Waste management will be dealt with more extensively within the EMP for the relevant phases of the project. Refer to Appendix G – Environmental Management Programme.		
Where will the construction solid waste be disposed of? (Provide details of landfill site)		
❖ Solid Waste will be disposed of at a registered licensed landfill site. In the unlikely event that hazardous waste is produced it will be collected by a competent waste service provider and disposed of at the nearest licensed general waste disposal facility.		
Will the activity produce solid waste during its operational phase?	YES	☒
If yes, what estimated quantity would be produced per month?	Approximately 10 kg/ per day	
How will the solid waste be disposed of in the operational phase? (Provide details of landfill site)		
❖ To manage the wet sludge produced by the package plant, two sludge drying beds, each measuring 5m by 3m, will be installed. The dried solids will be periodically transported to a landfill in Mbazwana every three months. A 2m³ skip bin will be utilized for the transportation of the dried solids from the plant to the designated landfill site located 1km North West from the town of Mbazwana. ❖ It is important to note that the applicant is in consultation with the uMhlanbuyalingana Municipality on the disposal of sludge. Proof of disposal will be submitted with the Second Draft BAR.		

If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, then the applicant should consult with the competent authority to determine the further requirements of the application.		
Can any part of the solid waste be classified as hazardous in terms of the relevant legislation?	☐	NO
If yes, contact the competent authority to obtain clarity regarding the process requirements for your application.		
Is the activity that is being applied for a solid waste handling or treatment facility?	☐	NO
If yes, contact the competent authority to obtain clarity regarding the process requirements for your application.		

Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?	☐	NO
If yes, what estimated quantity will be produced per month?	N/A	
Will the activity produce any effluent that will be treated and/or disposed of on-site?	☐	NO
If yes, contact the competent authority to obtain clarity regarding the process requirements for your application.		
Will the activity produce effluent that will be treated and/or disposed of at another facility?	☐	NO
If yes, provide the particulars of the facility: -	N/A	
Facility name:	N/A	
Contact person:	N/A	
Postal address:	N/A	
Postal code:	N/A	
Telephone:	N/A	Cell: N/A
E-mail:	N/A	Fax: N/A
Describe the measures that will be taken to ensure the optimal reuse or recycling of wastewater, if any:		
N/A		

Emissions into the atmosphere

Will the activity release emissions into the atmosphere?	☐	NO
If yes, is it controlled by any legislation of any sphere of government?	☐	NO
If yes, contact the competent authority to obtain clarity regarding the process requirements for your application.		
If no, describe the emissions in terms of type and concentration:		

- ❖ **Limited dust liberation and emissions during the construction phase due to the off-loading of construction materials, movement of construction vehicles and clearing activities. Emissions generated will be in the form of dust, carbon dioxide (CO₂) and other vehicle emissions generated by diesel-powered machinery and trucks during the construction process (i.e., tip trucks, TLBs). These emissions will be composed primarily of CO₂ and will be of a low concentration. Proper maintenance of vehicles will mitigate high concentrated vehicle emissions. Dust generation can be mitigated by either water spraying and/or dust suppressants or by minimising the area that is cleared and re-vegetating exposed areas as quickly as possible. The speed of construction vehicles and other vehicles should be strictly controlled to avoid excessive dust generation and adhere to the speed limits as per the site-specific EMPr. Refer to Appendix G – Environmental Management Programme**

Generation of noise

Will the activity generate noise?	☐	NO
If yes, is it controlled by any legislation of any sphere of government?	☐	NO
If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.	☐	☐
If no, describe the noise in terms of type and level:	☐	☐
Construction Phase: ❖ Noise associated with normal construction activities, i.e., vehicles, generators and plant equipment will be used on the site. ❖ Noise levels are to be kept within the legislated limits for the area, following the requirements of the relevant national and local noise control statutes. ❖ Other noise disruptions could potentially be experienced during the construction phase through activities such as drilling. This will be a temporary disturbance. ❖ Measures to minimise noise generation during construction are contained in the EMPr.		
Operational Phase: ❖ The WTP will generate minimal noise. ❖ Noise levels are to be kept within the legislated limits for the area, following the requirements of the relevant national and local noise control statutes. ❖ Any high noise generating activities will be scheduled between 08:00am and 17:00pm. ❖ Where feasible, silencers or mufflers on air blowers and vibration isolators or dampers will be utilised.		

SECTION 3: POLICY AND LEGISLATIVE FRAMEWORK

2014 NEMA EIA Regulations (as amended), appendix 1- 3(e) a description of the policy and legislative context within which the development is proposed including – (i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report (ii)

3.1. Identification of All Legislation, Policies, Plans, Guidelines, Spatial Tools, Municipal Development Planning Frameworks and Instruments as per Section 3(e)(i) and Compliance of Proposed Activity with Legislation and Policy 3(e)(ii)

Legislation	Section	Relates to
The Constitution (No 108 of 1996)	Chapter 2	Bill of Rights.
	Section 24	Environmental rights.
National Environmental Management Act (No 107 of 1998 [as amended])	Section 2	Defines the strategic environmental management goals and objectives of the government. Applies throughout the Republic to the actions of all organs of state that may significantly affect the environment.
	Section 24	Provides for the prohibition, restriction and control of activities that are likely to have a detrimental effect on the environment.
	Section 28	The developer has a general duty to care for the environment and to institute such measures as may be needed to demonstrate such care.
	Section 30	Deals with the control of emergency incidents, including the different types of incidents, persons responsible for the incidents and reporting procedures to the relevant authority.
National Environmental Management: Waste Act (No 59 of 2008)		Provides specific waste management measures and the remediation of contaminated land.
		Regulations for waste management licensee activities
National Environmental Management: Biodiversity Act (No 10 of 2004) Threatened or protected species (GN 388) Lists of species that are threatened or protected (GN 389) Alien and invasive species regulations (GNR 506) Publication of exempted alien species (GNR 509) Publication of National list of invasive species (GNR 507) Publication of prohibited alien species (GNR 508)		Provides for the management and conservation of biodiversity, protection of species and ecosystems, and sustainable use of indigenous biological resources – provisions re alien and invasive species?
Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)		The objects of this Act are to provide for the conservation of the natural agricultural resources of the Republic by the maintenance of the production potential of land, by combating and preventing of erosion and weakening or

Legislation	Section	Relates to
		destruction of the water sources, and by the protection of the vegetation and the combating of weeds and invader plants. Section 5 details measures for the prohibition of the spreading of weeds.
National Environmental Management: Air Quality Act (No 39 of 2004)	Section 32	Control of dust
	Section 34	Control of noise
	Section 35	Control of offensive odours
National Noise Control Regulations (1992) in terms of Section 25 of the Environmental Conservation Act (Act 73 of 1989)		General prohibitions and restrictions on noise pollution.
National Heritage Resources Act (No 25 of 1999) and regulations	Section 34	No person may alter or demolish any structure or part of a structure that is older than 60 years without a permit issued by the relevant provincial heritage resources authority.
	Section 35	No person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter, deface, or otherwise disturb any archaeological or paleontological site.
	Section 36	No person may, without a permit issued by the South African Heritage Resource Agency (SAHRA) or a provincial heritage resources authority destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority. "Grave" is widely defined in the Act to include the contents, headstone, or other markers of such a place, and any other structure on or associated with such place.
	Section 38	This section provides for Heritage Impact Assessments (HIAs), which are not already covered under the ECA. Where they are covered under the ECA, the provincial heritage resources authorities must be notified of a proposed project and must be consulted during the HIA process. The Heritage Impact Assessment (HIA) will be approved by the authorising body of the provincial directorate of environmental affairs, which is required to take the provincial heritage resources authorities' comments into account prior to making a decision on the HIA.
KwaZulu-Natal Heritage Resources Act (No 4 of 2008)		Provides for the conservation, protection and administration of both the physical and the living or intangible heritage resources of the Province of KwaZulu-Natal.
Occupational Health and Safety Act (No 85 of 1993)	Section 8	General duties of employers to their employees
	Section 9	General duties of employers and self-employed persons to persons other than their employees
National Water Act (No 36 of 1998) and regulations	Section 19	Prevention and remedying the effects of pollution
	Section 20	Control of emergency incidents
	Section 21	Licenses for water use
National Water Resource Strategy (2013)		The objects of this strategy are to facilitate proper management of water resources and provide a framework for protection, use, development, conservation, management, and control of water resources for the country as a whole.

Legislation	Section	Relates to
Hazardous Substances Act (No 15 of 1973) and regulations		Provides for the definition, classification, use, operation, modification, disposal or dumping of hazardous substances
Hazardous Chemical Agents Regulations (2021)		Regulations for the classification, labelling, packaging, disclosure of ingredient identity and disposal of HCA's.
National Veld & Forest Fire Act		Provides for a variety of institutions, methods, and practices to prevent and combat veld, forest, and mountain fires.
National Road Traffic Act (No 93 of 1996)		Provides for controlling transport of dangerous goods, hazardous substances, and general road safety
Spatial Planning and Land Use Management Act (No. 16 of 2013).		Provides the framework for spatial planning and land use management in South Africa at the different spheres of government and for the establishment, functions, and operations of Municipal Planning Tribunals.
Occupational Health and Safety Act (No 85 of 1993) and regulations		Addresses occupational health and safety aspects
SANS 10103 (Noise Regulations)		The measurement and rating of environmental noise with respect to annoyance and to speech communication
uMkhanyakude District Municipality		uMkhanyakude District Municipality Integrated Development Plan (IDP) – 2018/2019
National Climate Change Response Plan White Paper (2011)		The White Paper presents the South African Government's vision for an effective climate change response and the long-term, just transition to a climate-resilient and lower carbon economy and society.
World Heritage Convention Act (No. 49 of 1999)		Provides for the incorporation, enforcement and implementation of the World Heritage Convention into South Africa.
Marine Living Resources Act (Act 18 of 1998)		Provides the management and conservation of South Africa's biodiversity as well as the protection of species and ecosystems that warrant national protection.
Construction Regulations (2003)		Regulations for ensuring safe working conditions.

Table 13: Current Environmental Legislation

Regulations and Guidelines
Environmental Impact Assessment Regulations, 2014 (as amended).
Internal Guideline: Generic Water Use Authorisation Application Process, August 2007 by DWA.
The General Policy on Environmental Conservation (January 1994).
DEA (2017), Guideline on Need and Desirability, Department of Environmental Affairs (DEA), Pretoria, South Africa.
Department of Environmental Affairs (2017), Public Participation guideline in terms of NEMA EIA Regulations, Department of Environmental Affairs, Pretoria, South Africa.
iSimangaliso Wetland Park Integrated Management Plan (2022 – 2031)
Guidance and toolkit for Impact Assessment in a World Heritage Context (2022)

Table 14: Current Municipal By-Laws

By-Laws
uMkhanyakude District Municipality – Spatial Planning and Land Use Management By-laws (2017)
uMkhanyakude District Municipality – Waste Management By-laws (2022)
uMkhanyakude District Municipality – Environmental Health and Public Nuisance By-laws (2023)
uMkhanyakude District Municipality – Water Services and Sanitation By-laws (2023)

SECTION 4: MOTIVATION, NEED AND DESIRABILITY

4.1. Need and Desirability as per Section 3(f)

The Mabibi Water Supply Scheme has been proposed in direct response to the severe and persistent water supply challenges experienced within the uMhlabuyalingana Local Municipality, under the jurisdiction of uMkhanyakude District Municipality. Currently, many communities within the Mabibi area rely on groundwater abstraction through communal boreholes and house-hold level rainwater harvesting, which are often unreliable, of poor quality, and insufficient to meet basic domestic demands. Seasonal variability, declining groundwater levels, and increased population pressures have exacerbated the situation, leading to frequent water shortages and significant service delivery backlogs.

The uMngeni-uThukela Water has therefore proposed the Mabibi Water Supply Scheme to regulate potable water supply to the Mabibi community. The project proposes the abstraction of water from Lake Sibayi, which will then be treated at the proposed Mabibi Package Water Treatment Plant, and distributed to the Mabibi community.

This initiative directly supports government objectives of equal access to safe and reliable drinking water, as stipulated in the following:

- Section 27(1)(b) of the Constitution of the Republic of South Africa (Act 108 of 1996), which states that every citizen has the right to sufficient food and water;
- The National Development Plan (NDP 2030), which emphasises equitable water access as a driver for social and economic development; and
- The Strategic Framework for Water Services (2003) and Water Services Act (Act 108 of 1997), which mandate Water Services Authorities to ensure adequate water supply and sanitation for all.

As per the uMhlabuyalingana Local Municipality IDP (2023 – 2025) and the uMhlabuyalingana Local Municipality SDF (2017), the following key development challenges have been identified:

- Inadequate access to potable water and sanitation;
- High poverty and unemployment levels; and
- Limited infrastructure and economic development in rural settlements.

The proposed Mabibi Water Supply Scheme contributes directly to these local objectives by supplying safe drinking water to communities currently dependent on unreliable or unsafe water sources. It introduces critical water services which forms the foundation for broader socio-economic development by providing both infrastructure and job opportunities. Furthermore, the proposed rising main has been designed with a minimal environmental footprint, as it is located along an existing dirt road. The abstraction point will be located within Lake Sibayi however, floating infrastructure will be utilised, with minimal impact on the aquatic environment.

The project addresses a critical basic human need and reinforces the local municipality's spatial vision of sustainable and inclusive development, while taking cognisance of the sensitive ecological environment. The proposed Mabibi Water Supply Scheme will also support public health and wellbeing, and contribute to local socio-economic upliftment.

The uMkhanyakude District Municipality Draft IDP (2023 – 2024) has consistently identified water provision and infrastructure development as priority concerns. The proposed Mabibi Water Supply Scheme aligns with the IDP as it will improve access to basic services such as water and sanitation by providing reliable potable water supply to the Mabibi community, addressing persistent service delivery backlogs. From a socio-economic perspective, the proposed project will uplift the Mabibi community by promoting public health and encouraging tourism linked to the iSimangaliso Wetland Park which will stimulate local economic activity.

The Mabibi Water Supply Scheme aligns with and supports the strategic objectives and development goals in both the local and district municipalities. It strengthens the municipalities' capacity to deliver on their obligation to provide access to basic services, contribute to socio-economic upliftment, and promotes environmentally responsible development.

On a global scale, the proposed project aligns with Goal 6 of the 2030 Sustainable Development Goals (SDG) which states the following: "Ensure availability and sustainable management of water and sanitation for all".

Overall, the proposed Mabibi Water Supply Scheme will address water scarcity, improve health and wellbeing, and meet the growing water demand. Furthermore, it aligns with national and local plans and goals, promotes socio-economic upliftment, and long-term resilience.

4.2. Motivation for the Preferred Site, Activity and Technology as per Section 3(g)

uMngeni-uThukela water intends to implement the proposed Mabibi Water Supply Scheme in order to address the numerous water supply challenges being experienced under the uMhlabuyalingana Municipality areas of jurisdiction, thus uMngeni-uThukela water has sought funding from the Water Service Infrastructure Grant (WSIG) on behalf of uMkhanyakude District Municipality, the Water Services Authority and Water Service Providers for addressing the growing challenges of water supply.

The following Preferred Design and Technology alternatives were carried through your assessment and supported by the Specialists:

- **Rising Main Option 1 (Preferred)** – The proposed establishment of the 2000m 160mmØ bulk uPVC rising main from the abstraction point (Lake Sibayi) to the Mabibi Package Water Treatment Plant. The route of the rising main will follow the existing D1848 gravel road, thus avoiding the wetland sensitive areas delineated on the site. The route was supported by the Wetland Specialist (2025), which scored the impacts a "Low" significance rating.
- **Abstraction of 1ML/Day from the Lake Sibayi (Preferred)** – The abstraction of water from the Lake Sibayi received Water Use Authorisation (WUA) from the Department of Water and Sanitation (DWS) on the 27th August 2024. The WUA authorised the allocation of 365 000 m³/a from Lake Sibayi to develop the Mabibi Package Plant Water Treatment Works as follows:
 - uMkhanyakude District Municipality currently has an allocation of 1 825 000 m³/a under registration number 21121910 to supply water for drinking to the same communities reflected in the application. The District Municipality has an additional allocation of 649 250 m³/a under registration number 21160066 and 21160084 from the same lake for other areas.
 - Therefore, DWS indicated that Umngeni – Uthukela Water Water proceed with the construction of the Mabibi Package Plant Water Treatment Works and abstract water from Lake Sibayi as there is an existing allocation under uMkhanyakude District Municipality.

It is also important to note that the abstraction of water from the Lake is a short-term intervention and will be discontinued once the supply from Jozini Dam reaches the Mabibi area.

A cost comparison between the planned long-term intervention of supplying the project area (Mabibi) from the Jozini Regional Water Supply Scheme and the short-term intervention of supply from Lake Sibayi are compared side by side in the table below.

Description	Short Term Intervention Lake Sibayi Water Supply	Long Term Intervention Jozini Water Supply Scheme
Bulk Infrastructure Cost (including VAT)	R26 438 816,25	R544 860 780,12

The cost estimate for the short-term intervention of supplying from Lake Sibayi is 4,9% of the cost estimate for the long-term intervention of supply from Jozini Dam. In view of the foregoing the short-term solution of abstracting from Lake Sibayi has been selected as recommended solution for the water supply challenges in the Mabibi area.

Abstraction from the Jozini Dam (Long-term Option) -

uMkhanyakude District Municipality's (UKDM) Universal Access Plan Phase 3 proposes that the Mabibi area be supplied from Jozini Dam through the Jozini Regional Water Supply Scheme. The primary water source for the water supply scheme is Pongola Dam. Raw Water abstraction is currently at 37Ml/day and is earmarked to be upgraded to 80Ml/day in the future to accommodate other areas in Umhlabuyalingana LM and including the Mabibi area.

The infrastructure required will eventually deliver raw water supplies to the Mabibi area. According to UKDM, the implementation of the Jozini Regional Water Scheme has recently commenced with the first 10km of the 760mm diameter pipeline having been completed. Tenders for the balance of the 5,3km will be advertised the next financial year. The envisaged completion of the bulk conveyance infrastructure to deliver raw water supplies to Mabibi could be completed in the next 30 to 40 years. This will also depend largely on funding provisions and annual budget allocations for the project.

It is important to note that once the water supply reaches the Mabibi area, this abstraction method will be implemented.

SECTION 5: PUBLIC PARTICIPATION

5.1. Notification of Interested and Affected Parties (I&APs)

- (a) *fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of—*
- (i) *the site where the activity to which the application or proposed application relates is or is to be undertaken; and*
 - (ii) *any alternative site.*

Six (6) site notices in the languages, English and IsiZulu were placed on the 3rd of October 2025 at the following locations:

1. **Start:** 27°20'23.23"S; 32°42'59.87"E
2. **Middle:** 27°19'48.15"S; 32°43'18.06"E
3. **End:** 27°19'44.39"S; 32°43'32.65"E

The site notice detailed the proposed activity and invited stakeholders and I&APs to register. Refer to Appendix E2 for a copy of the site notice Appendix E3 for proof of placement of the site notice boards.

- (b) *giving written notice, in any of the manners provided for in section 47D of the Act, to—*
- (i) *the occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;*
 - (ii) *owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;*
 - (iii) *the municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area;*
 - (iv) *the municipality which has jurisdiction in the area;*
 - (v) *any organ of state having jurisdiction in respect of any aspect of the activity; and*
 - (vi) *any other party as required by the competent authority;*

Stakeholders and I&APs were notified about the Environmental Process, through the distribution of the Background Information Document (BID) via email on the 14th of October 2025. With regards to authority communications, all relevant authorities have been notified of the application.

Refer to Appendix E5 – Background Information Document.

- (c) *placing an advertisement in—*
- (i) *one local newspaper; or*
 - (ii) *any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;*
- (d) *placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official Gazette referred to in paragraph (c)(ii);*

An advertisement was placed in the Zululand Observer on the 10th of October 2025 which provides information on the project dates and requested for potential I&APs to register themselves in order to get further information on the project and the Basic Assessment process.

Refer to Appendix E4 - Proof of the Advertisement.

I&AP Public Feedback Meeting

Stakeholder engagement will continue throughout the Basic Assessment process.

5.2. Authority Notification

A Pre-application consultation was conducted with the Department of Forestry, Fisheries and the Environment (DFFE) on the 25th of September 2025.

Refer to **Appendix I1** for a copy of the Meeting Minutes.

5.3. Registered Interested and Affected Parties

A proponent or applicant must ensure the opening and maintenance of a register of interested and affected parties and submit such a register to the competent authority, which register must contain the names, contact details and addresses of—

- (a) all persons who, as a consequence of the public participation process conducted in respect of that application, have submitted written comments or attended meetings with the proponent, applicant or EAP;
- (b) all persons who have requested the proponent or applicant, in writing, for their names to be placed on the register; and
- (c) all organs of state which have jurisdiction in respect of the activity to which the application relates.

Refer to **Appendix E6 – I&AP database**

5.4. First Draft Basic Assessment Report

The First Draft Basic Assessment will be distributed to all relevant stakeholders and I&APs for the regulated 30-day comment period. The comment period will commence from the 13th November 2025 and end on the 13th December 2025.

5.5. Comments and Responses Report

- (1) The applicant must ensure that the comments of interested and affected parties are recorded in reports and plans and that such written comments, including responses to such comments and records of meetings, are attached to the reports and plans that are submitted to the competent authority in terms of these Regulations.
- (2) Where a person desires but is unable to access written comments as contemplated in sub-regulation due to -
 - (a) a lack of skills to read or write;
 - (b) disability; or
 - (c) any other disadvantage;
 - (d) reasonable alternative methods of recording comments must be provided for.

All concerns, comments and questions (collectively referred to as “issues”) have been documented and responded to adequately in a Comment and Response Report, attached as **Appendix E8**.

SECTION 6: IMPACT ASSESSMENT

6.1. Methodology to Determine and Rank Significance and Consequences of Impacts Associated with all Alternative as per Section 3(h)(vi)

2014 NEMA EIA Regulations (As Amended), Appendix 1- 3(H) (vi) the methodology used in determining and ranking the nature, significance, consequence, extent, duration and probability of potential environmental impacts and risks associated with the alternatives, (v) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts can be reversed, may cause irreplaceable loss of resources and can be avoided, managed and mitigated. Appendix 1- 3 (I) A full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity- (i)- (ii). Appendix 1- 3 (J) an assessment of each identified potentially significant impact and risk (i)- (vii)

Scoring of Impacts	
Consequence	
Severity	1 – Insignificant / Non-harmful 2 – Small / Potentially harmful 3 – Significant / Slightly harmful 4 – Great / Harmful 5 – Disastrous / Extremely harmful
Duration	1 – Up to 1 month 2 – 1 month to 3 months 3 – 3 months to 1 year 4 – 1 to 10 years 5 – Beyond 10 years / Permanent
Spatial Scale	1 – Immediate, fully contained area 2 – Surrounding area 3 – Within business unit area or responsibility 4 – Within mining boundary area / Beyond BU boundary 5 – Regional, National, International
Overall Consequence = (Severity + Duration + Extent) / 3	
Likelihood	
Frequency of the Activity	1 – Once a year or once / more during operation / LOM 2 – Once / more in 6 months 3 – Once / more a month 4 – Once / more a week 5 – Daily / hourly
Probability of the Incident / Impact	1 – Almost never / almost impossible 2 – Very seldom / highly unlikely 3 – Infrequent / unlikely / seldom 4 – Often / regularly / likely / possible 5 – Daily / highly likely / definitely
Overall Likelihood = (Frequency + Probability) / 2	
Overall Environmental Significance = Overall Consequence * Overall Likelihood	
Overall Environmental Significance	
0 - 2.9	Very Low
3 - 4.9	Low
5 - 6.9	Medium - Low
7 - 8.9	Medium
9 - 10.9	Medium - High

6.2. Impacts that may result from the Planning and Design, Construction, Operational, Decommissioning and Closure Phases as well as Proposed Management of Identified Impacts and Proposed Mitigation Measures

Provide a summary and anticipated significance of the potential direct, indirect and cumulative impacts that are likely to occur as a result of the planning and design phase, construction phase, operational phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed. This impact assessment must be applied to all the identified alternatives to the activities.

Refer to **Appendix F - Impact Assessment Matrix-**

6.3. Environmental Impact Statement as per Section 3(1)

Alternative S1 (Only Site Alternative): Mabibi Water Supply Scheme located within the Umhlabuyalingana Local Municipality and uMkhanyakude District Municipality.

Alternative D1 - Rising Main Option 1 (Preferred) – The proposed establishment of the 2000m 160mmØ bulk uPVC rising main from the abstraction point (Lake Sibayi) to the Mabibi Package WTP. The route of the rising main will follow the existing D1848 gravel road, thus avoiding the wetland sensitive areas delineated on the site. The route was supported by the Wetland Specialist (2025), which scored the impacts a “Low” significance rating.

Alternative T1 - Abstraction of 1ML/Day from the Lake Sibayi (Preferred) –

The abstraction of water from the Lake Sibayi received Water Use Authorisation (WUA) from the Department of Water and Sanitation (DWS) on the 27th August 2024.

The Basic Assessment considered relevant environmental aspects and impacts from the proposed development and proposed mitigation during the planning, construction and operational phases.

uMngeni-uThukela water intends to implement the proposed Mabibi Water Supply Scheme in order to address the numerous water supply challenges being experienced under the uMhlabuyalingana Municipality areas of jurisdiction, thus uMngeni-uThukela water has sought funding from the Water Service Infrastructure Grant (WSIG) on behalf of uMkhanyakude District Municipality, the Water Services Authority and Water Service Providers for addressing the growing challenges of water supply.

The proposed infrastructure for the Mabibi Water Supply Scheme will include the following:

- A floating raw water abstraction work with two (2) pumps, where one (1) shall be utilised and the other will be on standby.
- Establishment of a 2000m 160mmØ bulk uPVC rising main from the abstraction point (Lake Sibayi) to the Mabibi Package Water Treatment Plant.
- The proposed Mabibi Packaged Water Treatment Plant (WTP) is sized to service a capacity of 1MI/day.
- A 50kl elevated tank for the storage of clean water within the Mabibi WTP.

The following alternatives were identified as preferred for the proposed development activity:

- **Alternative D1 - Rising Main Option 1 (Preferred) –** The proposed establishment of the 2000m 160mmØ bulk uPVC rising main from the abstraction point (Lake Sibayi) to the Mabibi Package Water Treatment Plant. The route of the rising main will follow the existing D1848 gravel road, thus avoiding the wetland sensitive areas delineated on the site. The route was supported by the Wetland Specialist (2025), which scored the impacts a “Low” significance rating.

- **Alternative T1 - Abstraction of 1ML/Day from the Lake Sibayi (Preferred) –** The abstraction of water from the Lake Sibayi received Water Use Authorisation (WUA) from the Department of Water and Sanitation (DWS) on the 27th August 2024. The WUA authorised the allocation of 365 000 m³/a from Lake Sibayi to develop the Mabibi Package Plant Water Treatment Works as follows:
- uMkhanyakude District Municipality currently has an allocation of 1 825 000 m³/a under registration number 21121910 to supply water for drinking to the same communities reflected in the application. The District Municipality has an additional allocation of 649 250 m³/a under registration number 21160066 and 21160084 from the same lake for other areas.
- Therefore, DWS indicated that uMngeni – Uthukela Water proceed with the construction of the Mabibi Package Plant Water Treatment Works and abstract water from Lake Sibayi as there is an existing allocation under uMkhanyakude District Municipality.

A summary of the impacts associated with the alternatives are outlined below:

❖ **Construction Phase – Short Term Duration**

- *Groundworks associated with the abstraction point – can be mitigated to Low significance.*
- *Establishment of the rising main pipeline (clearing of vegetation, sedimentation, flow modification) - can be mitigated to Low significance.*
- *Establishment of the Mabibi Package WTP (stormwater management, vegetation clearing, oil leaks) - can be mitigated to Low significance.*
- *Loss of SCC flora species - can be mitigated to Low significance.*
- *Disturbance of local fauna populations and fauna mortalities - can be mitigated to Low significance.*
- *Pollution of soils and habitat - can be mitigated to Low significance.*

❖ **Operation Phase – Long Term Duration**

- *Abstraction (reduced flow / water levels, potential scouring, habitat transformation) - can be mitigated to Low significance.*
- *Pipeline (potential contamination of oil during maintenance) - can be mitigated to Low significance.*
- *Mabibi Package WTP (poor stormwater management) - can be mitigated to Low significance.*
- *Mabibi Package WTP (poor management of sludge) – can be mitigated to Low provided that the sludge is disposed off as and when required to the Municipality.*

Construction and operational phase impacts ranged from High - Low pre-mitigation. All the anticipated impacts can however be significantly reduced through the mitigation measures provided to Low - Minor levels of impact significance ratings.

Residual risks are expected to be of short duration and of Low - Minor impact significance, provided that the mitigation measures in this report are implemented. No significant cumulate effects on the environment (i.e., sensitive terrestrial habitats and species) are anticipated.

The Mabibi Water Supply Scheme aligns with and supports the strategic objectives and development goals in both the local and district municipalities. It strengthens the municipalities' capacity to deliver on their obligation to provide access to basic services, contribute to socio-economic upliftment, and promotes environmentally responsible development.

On a global scale, the proposed project aligns with Goal 6 of the 2030 Sustainable Development Goals (SDG) which states the following: "Ensure availability and sustainable management of water and sanitation for all".

Overall, the proposed Mabibi Water Supply Scheme will address water scarcity, improve health and wellbeing, and meet the growing water demand. Furthermore, it aligns with national and local plans and goals, promotes socio-economic upliftment, and long-term resilience.

Alternative S2 (Not Applicable) – An alternative site is NOT APPLICABLE

Alternative D2 (Not Supported – Rising Main Route 2)

Alternative T3 (Not supported – Boreholes)

The Basic Assessment considered relevant environmental aspects and impacts from the proposed development and proposed mitigation during the planning, construction, and operational phases.

The following alternatives were only assessed during the planning phase of the development:

- Alternative D2 – Rising Main Route Option 2 (Not Supported) - The proposed establishment of the 2000m 160mmØ bulk uPVC rising main from the abstraction point (Lake Sibayi) to the Mabibi Package Water Treatment Plant. The route of the rising main intercepts the delineated wetland system at two sections. The route was NOT support by the Watercourse specialist due to the destruction of the wetland systems.
- Supply from Boreholes (Not Supported) - A borehole Yield Analysis was conducted by Terratest (2024). The assessment noted that the volumes drawn from the two (2) boreholes associated with the Mabibi area was very low compared to the water demand requirements. The yield is outlined in the table below.

The highest abstraction volume from the borehole investigation is 0,83l/s (72kl/day) compared to the demand for the Mabibi area of 150kl/day. The boreholes are thus not a sustainable water supply solution.

Due to the above, this alternative was not considered as sustainably viable and as such was not considered past the planning phase.

6.4. Impact Management Measures from Specialist Reports for the Development for Inclusion in the EMPr as per Section 3(m)

2014 NEMA EIA Regulations (as amended), Appendix 1- 3(M) based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management outcomes for the development for inclusion in the EMPr.

The following outcomes must be considered as per the Agricultural Impact Assessment:

- ❖ Erosion control during the construction phase as well as operational phase.
- ❖ Provision for ablution blocks.
- ❖ Stormwater management.
- ❖ Risks from oil/hydrocarbon spills from vehicles should be mitigated.

Refer to **Appendix D1** – Agricultural Compliance Statement

The following outcomes must be considered as per the Terrestrial Impact Assessment:

Construction phase

Loss of habitat in an area of very high sensitivity for terrestrial and aquatic biodiversity features

- ❖ The undeveloped areas beyond the boundaries of the development footprint should be regarded as Highly Sensitive and treated as no-go areas. The no-go areas must be expressly off limits to construction personnel and construction vehicles. This should be clearly communicated to them and monitored daily.
- ❖ No vegetative matter may be removed from the no-go areas.
- ❖ No fires or open flames should be permitted close to the no-go areas, especially in the dry season.
- ❖ No vegetation clearance, construction camps, access roads, firewood collecting, hunting, disturbance of fauna/flora must be allowed in the no-go areas.
- ❖ No fires must be permitted under trees.
- ❖ No vegetative matter may be removed for firewood.
- ❖ No material storage or laydown must be permitted under trees.
- ❖ All work-related activities including material storage must be accommodated in the pipeline servitude.
- ❖ In areas where vegetation clearance will be required, vegetation clearance must be confined to the development footprint, and the boundaries of the areas to be cleared must be clearly demarcated.
- ❖ Make use of existing roads and tracks where feasible, rather than creating new routes.
- ❖ No off-road driving must be permitted.
- ❖ Clearing of vegetation must be undertaken as the work front progresses. Mass clearing is not to be permitted.
- ❖ During felling and the clearing of woody vegetation, avoid the removal of and / or damage to the lower strata of vegetation, the basal grass cover and topsoil layer wherever possible.
- ❖ Strip and stockpile herbaceous vegetation, overlying grass, and other fine organic matter along with the topsoil.
- ❖ Topsoil should be stockpiled separately from overburden (subsoil).
- ❖ Do not strip topsoil when it is wet.
- ❖ Store stripped topsoil in approved, demarcated areas for later reuse in the rehabilitation process.
- ❖ Stockpile topsoil stripped from different areas separately, as reapplication during rehabilitation must be site specific. If necessary, keep a stockpile register.
- ❖ Do not mix topsoil obtained from different areas.
- ❖ Topsoil should be utilised as soon as possible for reclamation to ensure minimal loss due to erosion and reduced fertility of the stockpiled soils. Where this is not possible, topsoil stockpiles must be kept at a height of 2 m in order to limit run-off rate and reduce erosion.
- ❖ Topsoil is to be handled twice only – once to strip and stockpile, and once to replace and level.
- ❖ Ensure that all topsoil is stored in such a way and place that it will not cause erosion gullies or wash away.
- ❖ Protect topsoil stockpiles from erosion.
- ❖ Remove exotic / invasive plants and broad leaf weeds that emerge on topsoil stockpiles regularly.
- ❖ If topsoil is to be stockpiled for extended periods and indigenous vegetation failed to establish itself in situ on the stockpiles, the following measures must be implemented:
 - The re-vegetation of the stockpiles with locally occurring indigenous grasses.
 - The covering of the stockpiles with a protective material such as hessian mats.
 - The progressive monitoring of soil stockpiles to check for degradation and/or pollution on at least a quarterly basis through fertility analysis.
 - The application of amelioration procedures based on the outcome of the fertility analysis and prior to the topsoil being used in the rehabilitation process.

- ❖ Ensure that topsoil is at no time buried, mixed with spoil (excavated subsoil), rubble or building material, or subjected to compaction or contamination by vehicles or machinery. This will render the topsoil unsuitable for use during rehabilitation.
- ❖ The areas demarcated for topsoil storage should be regarded as no-go areas.
- ❖ Co-ordinate works to limit unnecessarily prolonged exposure of stripped areas and stockpiles. Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area.
- ❖ The principle of Progressive Reinstatement must be followed wherever possible. This includes the reinstatement of disturbed areas on an ongoing basis, immediately after the specified construction activities for that area are concluded.
- ❖ Where possible, programme the backfill of the trenches so that subsoil is deposited first, followed by topsoil.
- ❖ Replace and redistribute stockpiled topsoil together with herbaceous vegetation and other fine organic matter.
- ❖ Replace topsoil to the original depth (i.e., as much as was removed).
- ❖ Do not use topsoil suspected to be contaminated with the seeds of alien invasive plant species.
- ❖ Monitor the backfilled areas for subsidence and fill depressions using available material.
- ❖ Shape all disturbed areas to blend in with the surrounding landscape.
- ❖ Should revegetation be required, only species indigenous to the local area must be used. Under no circumstances may exotic species be used during revegetation.

Following the completion of construction activities, the following must be implemented:

Removal of structures and infrastructure

- ❖ Clear and completely remove from site all plant, equipment, storage containers, and any other temporary works.
- ❖ Ensure that all access roads utilized during construction are returned to a usable state and / or a state no worse than that prior to construction.
- ❖ Roads that are earmarked for closure and rehabilitation must be ripped to facilitate seed trapping and water penetration. Stockpiled topsoil together with herbaceous vegetation, overlying grass, and other fine organic matter must be placed on the disturbed areas and revegetated.

Inert waste and rubble.

- ❖ Clear the site of all inert waste and rubble.
- ❖ Remove from site all domestic waste and dispose of it in the approved manner at a registered waste disposal facility.

Hazardous waste and pollution control.

- ❖ Remove from site all temporary fuel stores, hazardous substance stores, hazardous waste stores and pollution control sumps. Dispose of hazardous waste at a registered waste disposal facility licensed to accept and dispose of hazardous waste.
- ❖ Remove from site all pollution containment structures. Dispose of materials that will not be used again as hazardous waste.
- ❖ Remove from site all temporary sanitary infrastructure and wastewater disposal systems. Take care to avoid leaks, overflows and spills and dispose of any waste in the appropriate manner.

Loss of SCC flora**Proposed mitigation measures:**

- ❖ To protect the habitat of *F. laxa* subsp. *azurea*, the main pipeline route must be diverted away from the area where *F. laxa* subsp. *azurea* is present. The translocation of this species must not be considered as an alternative mitigation option as this will not negate or decrease the net habitat and biodiversity loss within the project area.
- ❖ A pre-vegetation clearance walk-through survey must be conducted by a suitably qualified specialist to ensure that no SCC species listed as potential occurrences are present. The walk-through survey must be conducted during the optimal flowering period of the species that is listed in Table 13 of the Terrestrial Impact Assessment. It is recommended that the walk-through survey be conducted between Nov - Jan.
- ❖ During the walk-through survey, these specimens, as well as any other SCC species encountered, must be clearly marked. Should any EN or VU species be present, additional species-specific mitigation measures must be provided by the specialist that may include avoidance mitigation, for example, the rerouting of the pipeline).
- ❖ *S. birrea* - several individuals are present in the project area. The species is protected under the National Forest Act, and a permit for the removal of the individuals will be required. It is however recommended that the larger individuals (> 3.4 - 4 m) be left intact as far as possible as refuges and habitats. Trenches must be at least 3 m away from the stem of the individuals that will be left intact.
- ❖ *C. stuhlmannii* & *D. cotinifolia* - Should the removal of these species be required, permits must be acquired from the Ezemvelo KZN Wildlife prior to the removal of the species.

Loss/disturbance of SCC fauna**Proposed mitigation measures:**

The mitigation measures outlined below is species specific and focused on the Red List species *M. ameliae*, *C. natalensis* and *C. mariquensis*. In addition to the mitigation measures outlined below, the mitigation measures provided and the following impact discussion (i.e., Disturbance of local fauna populations and fauna mortalities) must be implemented to limit disturbance and protect the prey species of Red Listed fauna present.

M. ameliae* & *C. natalensis

- ❖ Should vegetation clearance start in the egg laying periods of *M. ameliae* and *C. natalensis*, no more than 2 weeks prior to the start of vegetation clearance, a walk-through survey conducted by a suitably qualified Zoologist/Ecologist, especially in the hygrophilous grassland next to Lake Sibayi, must be undertaken to ensure that no nesting sites of the ground nesting birds *M. ameliae* and *C. natalensis* are present.
- ❖ Should actively nesting sites of the species listed above are located, vegetation clearance must be postponed until after the fledgling stage of a species (i.e., nestling period). Breeding information for the species is provided below:

C. mariquensis

- ❖ Any open trenches during the development of the site infrastructure must have an appropriately sloping section of the sidewall to ensure that any trapped animals can escape.
- ❖ Open trenches must be inspected daily and any trapped individuals that was unable to escape must be removed and released in a safe place and in a suitable habitat outside the project area. It is unlikely that the rescuer will be able to identify the shrew to species level, thus any shrew, including other small mammals (i.e., rodents) must be rescued. Shrews in general are very aggressive and will readily bite when handled. It is therefore advised that a plastic container be used to trap any individual/s. The use

of gloves by the rescuer is not advised as the shrews are very small and can be easily crushed if not handled properly.

Disturbance of local fauna populations and fauna mortalities

Proposed mitigation measures:

- ❖ Where possible, work should be restricted to one area at a time. This will give the smaller birds, mammals, and reptiles a chance to weather the disturbance in an undisturbed zone close to their natural territories.
- ❖ During vegetation clearance, methods should be employed to minimize potential harm to fauna species. Clearing must take place in a phased and slow manner, commencing from the interior of an area, progressing outwards towards the boundary to maximize the potential for mobile species to move to adjacent habitats.
- ❖ Prior and during vegetation clearance any larger fauna species noted should be given the opportunity to move away from construction machinery.
- ❖ Fauna species such as frogs and reptiles that have not moved away should be carefully and safely removed to a suitable location beyond the extent of the project area by the environmental control officer or other suitably qualified person.
- ❖ Any open trenches during the development of the site infrastructure must have an appropriately sloping section of the sidewall to ensure that any trapped animals can escape.
- ❖ All construction vehicles should adhere to clearly defined and demarcated roads, no off-road driving must be permitted.
- ❖ No wild animal may under any circumstance be handled (except for small fauna species trapped in excavations), removed, or be interfered with.
- ❖ No wild animal may under any circumstance be hunted, snared, captured, injured, or killed. This includes animals perceived to be vermin such as rodents as these animals serve as prey species for several avian, mammalian and reptilian species.
- ❖ Vehicles may not leave the designated roads and tracks and turnaround points must be limited to specific sites.
- ❖ The feeding of wildlife must be strictly prohibited.
- ❖ The handling and removal of any venomous species such as snakes must be strictly prohibited. Should any such species be encountered, a qualified and experienced professional with experience in snake handling and removal must be contacted immediately.
- ❖ All contractors and subcontractor personnel, including the project ECO must participate in an environmental awareness program of which proof must be provided in the form of attendance registers for example that must be kept in the Health, Safety and Environmental (HSE) site file. The program must include a description of the conservation significant fauna species present in the area, appropriate wildlife avoidance methodologies, such as impact minimisation procedures and methods for protecting sensitive fauna and habitats. Information about the importance and purpose of protecting wildlife must be described in the program. Proof of the content of the information communicated must be attached to the attendance registers.

Pollution of soils and habitat

Proposed mitigation measures:

Solid waste

- ❖ Collect all domestic waste in adequate numbers of litter bins located as required on the work sites.

- ❖ Litter bins must be equipped with a closing mechanism to prevent their contents from blowing out.
- ❖ Rodents are an important prey-item for many of the fauna species on the area and should not be indiscriminately killed. Waste food, empty food tins, and other waste which might attract rodents must therefore be stored in bins with tight fitting lids and regularly emptied.
- ❖ Ensure that employees make use of the litter bins provided.
- ❖ Domestic and office refuse must be sorted for recycling.
- ❖ Non-recyclable industrial waste must be disposed of at a registered hazardous material disposal site.
- ❖ Empty litter bins weekly (or as required before they reach capacity).
- ❖ Ensure that solid waste is transported properly, avoiding waste spills en-route.
- ❖ No solid waste may be burned on site.

Liquid waste

- ❖ Ensure that adequate numbers of conveniently located site toilets are always available in quantities related to the number of users (1 toilet per 30 users is the norm).
- ❖ Maintain and clean site toilets regularly as is required to keep them in good, functional working order and in an acceptable state of hygiene.
- ❖ Combine drinking water facilities with hand washing facilities near site toilets.
- ❖ Pollution control
- ❖ Do not dump waste of any nature, or any foreign material into the natural environment (i.e., no-go areas).
- ❖ Take special care during rainy periods to prevent the contents of sumps and drip trays from overflowing.
- ❖ Do not hose oil or fuel spills into the surrounding natural environment.
- ❖ Clean small oil or fuel spills with an approved absorbent material, such as 'Drizit' or 'Spill-sorb'.
- ❖ Treat soil contaminated by oil or fuel using one of the following methods:
 - Remove the soil to the depth of the contamination and dispose of at a registered Hazardous Waste Disposal Site.
 - Remove the soil to the depth of the contamination, and regenerate using approved bio-remediation methods
- ❖ Report major oil or fuel spills to the provincial Department of Water Affairs and Forestry, as well as to the relevant local authorities.
- ❖ Minimise fuels and chemicals stored on site.
- ❖ Chemical storage areas must be situated on a concrete slab surrounded by bund walling with a containment capacity of 150% of the chemicals stored.
- ❖ Implement a contingency plan to handle spills, so that environmental damage is avoided.
- ❖ No refuelling, servicing of plant/equipment or fuel storage must be allowed outside of designated areas.
- ❖ Drip trays must be used during fuel dispensing.
- ❖ Drip trays must be placed beneath standing machinery/plant. Drip trays are to be watertight and must be emptied regularly and before and after rain events. The contents of drip trays are to be treated as hazardous waste.
- ❖ In the case of petrochemical spillages, the spill must be collected immediately and stored in a designated area until it can be disposed of in accordance with the Hazardous Chemical Substances Regulations, 1995 (Regulation 15).
- ❖ Do not locate any site toilet or sanitary convenience, or any substance which is likely to cause pollution within a horizontal distance of 100 m from Lake Sibayi.
- ❖ No runoff or water from dewatering activities must be allowed to enter surface waters bodies without prior assessment and treatment if necessary.

- ❖ Do not discharge water containing pollutants or visible suspended materials into the no-go areas.
- ❖ Regularly check vehicles, machinery and equipment operating on site to ensure that none have leaks or cause spills of oil, diesel, grease, or hydraulic fluid.
- ❖ Any vehicles, machinery or equipment with leaks or causing spills must be immediately removed from the work areas and repaired.
- ❖ Ensure that the maintenance of all vehicles and equipment, including oil and lubricant changes, takes place only within properly equipped, bunded maintenance areas.
- ❖ Any old oil must be collected and stored and can be sold for recycling.
- ❖ Underlay light-duty vehicle wash bays and workshops with an impermeable PVC lining or thin concrete slab which drains into a conservancy tank.

Indirect impacts

Soil erosion and sedimentation

Proposed mitigation measures:

- ❖ Program construction activities so that the area of exposed soil is minimised during times of the year when the potential for erosion is high, for example during the rainy season.
- ❖ Site-specific plans for site erosion and sediment control must be developed and implemented.
- ❖ Trench widths and depths should be minimised to reduce spoil generation where possible.
- ❖ The length of time a trench is open should be minimised and backfill should commence immediately following pipe laying.
- ❖ Sediment barriers or sediment traps such as silt fences, sandbags, and hay bales for example must be established to curb erosion and sedimentation where necessary.
- ❖ Sediment barriers should be regularly maintained and cleaned to ensure effective drainage.
- ❖ These temporary barriers may only be removed once construction has been completed and there is no further risk of sedimentation.
- ❖ Stockpiles are not to be used as stormwater control features.
- ❖ Erosion and sediment control measures such as silt fences, concrete blocks and/or sandbags must be placed around stockpiles (i.e., soil and materials) to limit runoff.
- ❖ Stockpiling of any materials on slopes is to be avoided unless appropriate erosion control and management measures are implemented.
- ❖ Protect all areas from erosion and ensure that there is no undue soil erosion resultant from activities adjacent to the work areas.
- ❖ Retain natural shrubbery and grass species wherever possible.
- ❖ Do not permit vehicular or pedestrian access into undeveloped areas (no-go areas) beyond the demarcated boundary of the work areas.
- ❖ Make use of existing roads and tracks where feasible, rather than creating new routes.
- ❖ Ensure that only authorised roads and access routes are used.
- ❖ Vehicles may not leave the designated roads and tracks and turnaround points must be limited to specific sites.
- ❖ Maintain all access routes to minimise erosion and undue surface damage. Repair rutting and potholing immediately and maintain stormwater control mechanisms.
- ❖ Runoff from access roads must be managed to avoid erosion and pollution problems.
- ❖ No offroad driving is to be permitted.

Noise disturbance

Noise generated during the phase may not directly harm individual animals, but it could indirectly affect foraging and breeding behaviour which could have negative impacts on long term population levels.

Proposed mitigation measures:

- ❖ No loud music must be permitted on site.
- ❖ To reduce low intensity noise levels, engineering controls such as modifications to equipment or work areas to make it quieter, the acquisition of equipment designed to emit low noise and vibration, creation of noise barriers, proper maintenance of tools and equipment must be implemented.
- ❖ Noise from vehicles and equipment on-site should not exceed the manufacturer's specifications, based on the installation of a silencer.
- ❖ Equipment should be regularly serviced.
- ❖ Attention should also be given to muffler maintenance and enclosure of noisy equipment.

Introduction and spread of declared alien invasive plant species

Proposed mitigation measures:

The implementation of an invasive plant species management and control plan. The guidelines provided below describe the overall approach that should be adopted on the site to remove/control IAPs present, to minimize the probability of invasive alien plants from becoming established and to ensure that any outbreaks are managed quickly to prevent long-term problems. The establishment of any dense infestations will be expensive to eradicate and will require more complex control measures than would be necessary for low density invasions.

General Guidelines for the Clearing of Invasive Plant Species

- ❖ Invasive Alien management and control plans are long-term management interventions and should include a clearing plan, followed by an action plan for the rehabilitation of the cleared areas and a monitoring programme. Before any clearing of alien vegetation is initiated, it must be understood that once the plan is implemented, it must be implemented until completion. There is no value in ad hoc clearing, with no follow-up programmes.
- ❖ The clearing of vegetation must be undertaken as the work front progresses. Mass clearing is not to be permitted.
- ❖ All clearing actions should be monitored and documented to keep track of which areas are due for follow-up clearing.
- ❖ Clearing activities must be contained within the development footprint and may not spill over into adjacent areas.
- ❖ Prioritize areas that should be cleared first. Such areas may include but may not necessarily be limited to:
 - Less densely infested areas should be targeted first to prevent the build-up of seed banks.
 - Disturbed areas, to prevent new infestations from mass germination.
- ❖ Disturbed areas must be carefully monitored to prevent seed dispersal.
- ❖ The spread of invasive plants to areas outside of the development footprint must be prevented.
- ❖ Chemical mechanism of alien invasive plant control should be avoided unless absolutely necessary.
- ❖ Only indigenous and locally adapted plant species must be used in areas where re-vegetation is required.

Clearing Methods

Clearing methods suitable for the removal of the IAPs that is often used in South Africa include manual, mechanical, chemical, and biocontrol control methods. Details of these methods are provided below:

Manual methods

Always start at the highest point of the infestation and work downwards, i.e., downhill when using manual control methods. Start towards the edge of the infestation and work towards the centre.

- *Hand pulling*
 - ❖ Hand pulling is most effective with small (30 cm), immature or shallow rooted plants.
 - ❖ Shake the excess sandy material from the plant, this makes the plant easier to stockpile and lighter to transport.
- *Chopping/cutting/slashing*
 - ❖ These methods entail damaging or removing the plant by physical action. It is most effective for plants in the immature stage, or for plants that have woody stems/trunks.
 - ❖ This control option is feasible in sparse infestations or on small scale, and for controlling species that do not coppice after cutting.
 - ❖ For species that coppice after cutting (for example *Psidium guajava*), chemical treatment of the cut stumps will be required.
 - ❖ Cut/slash the stem of the plant as near as possible to ground level.
 - ❖ Paint coppicing species with an appropriate herbicide immediately after they have been cut.
 - ❖ Stockpile removed material into piles as prescribed.
- *Basal bark – for plant with thin bark or stems up to 25 cm in diameter*
 - ❖ Application of suitable herbicide in water can be carried out to the bottom 250 mm of the stem. Applications should be by means of a low pressure, coarse droplet spray from a narrow angle solid cone nozzle or by using a paintbrush.
 - ❖ If the plant is multi stemmed, then individual stems need to be treated.
- *Ring barking for large individual trees*
 - ❖ Remove the bark and cambium around the trunk of the tree in a continuous band around the tree at least 25 cm wide, starting as low as possible.
 - ❖ Where clean de-barking is not possible due to crevices in the stem or where roots are exposed, a combination of bark removal and basal stem treatments should be carried out.
 - ❖ For aggressively coppicing species pull off the bark below the cut to ground level (bark stripping), to avoid the use of herbicide.
- *Bark stripping*
 - ❖ All the bark should be stripped from the trunk between the ground level and 1 m above ground level.
 - ❖ Application of suitable herbicide can also be used with this method.
 - ❖ Herbicide applications should be by means of a low pressure, coarse droplet spray from a narrow angle solid cone nozzle or by using a paintbrush.
- *Frilling*

- ❖ Using an axe or bush knife, make a series of overlapping cuts around the trunk of the tree, through the bark into the softwood (approximately 500 mm from ground level). The thickness of the blade should force the bark open slightly, ensuring access to the cambium layer.
- ❖ Ensure to affect the cuts around the entire stem.
- ❖ Apply a suitable herbicide immediately to the cuts by spraying into the frill. The frill needs to be deep enough to retain the herbicide.

Mechanical methods

- *Felling*
 - ❖ De-branch cut trees and where possible remove all material.
 - ❖ Where possible large trees are to be felled so that they fall uphill.
 - ❖ Cut the plant down as low as possible to the ground.
 - ❖ Apply a suitable herbicide immediately (no later than 30 minutes) to the cambium layer.
 - ❖ Ensure all the cuts in the cambium layer are treated.
- *Injection*
 - ❖ Drill or punch downward slanting holes into the tree around the entire circumference of the stem.
 - ❖ Inject the chemical directly into the plant.
- *Foliar spray*
 - ❖ Use a solid cone nozzle that ensures even coverage on all leaves and stems to the point of runoff.
 - ❖ Do not spray just before rain (a rainfall-free period of 6 hours is recommended) or before dew falls.
 - ❖ Avoid spraying in windy weather as the spray may come into contact with non-target plants.
 - ❖ Spraying dormant or drought stressed plants is not effective as they do not absorb enough of the herbicide.
- *Cut stump application*
 - ❖ This is a highly effective and appropriate control method for larger woody vegetation that has already been cut off close to the ground.
 - ❖ The appropriate herbicide should be applied to the stump using a paintbrush within 30 minutes of being cut.
 - ❖ Stems should be cut as low as possible. Herbicides are applied in water as recommended for the herbicide.

Chemical control – the use of herbicides

- ❖ Only use herbicides that are registered for use on the specific species to be treated.
- ❖ Spray plants during the active growing period. When leaf color starts to turn for winter, it is too late to apply herbicides.
- ❖ Spray plants before the seeds are produced, namely, between flowering and fruit set. Avoid using herbicides on drought-stressed or diseased plants or in extremely hot or cold conditions.
- ❖ Do not spray plants that are over 1 m in height.
- ❖ Herbicides should not be applied during wet conditions, before or after rain. If it rains after application, it is important to monitor the effect as one may need to re-apply.
- ❖ Herbicides should always be applied immediately after the selected mechanical control method (e.g., after frilling, ringbarking, cut stumping or strip- barking). Once the stem has dried it will not absorb the herbicide. However, if for some reason this is not done, and one needs to apply the herbicide a few

days or a week or two later, it is imperative to remove any callous tissue that has formed. Once the living cells are exposed, the herbicide should be applied.

- ❖ Herbicides should be kept in the shade while at the work site to keep it cool.
- ❖ To avoid spills, keep herbicide containers on a waterproof tarpaulin, or inside a big plastic bucket. Use a funnel when decanting herbicides to avoid spilling. Should herbicide be spilled, it can be poured back into the container from the plastic bucket.
- ❖ Carefully read and understand the instructions on the label prior to initiating chemical control. Most selective herbicides will lose selectivity at a high enough dose, highlighting the importance of adhering to instructions on the label.
- ❖ Always store herbicides in the original container and in secure storage areas.
- ❖ Chemical control of alien plants is not recommended in or close to aquatic systems (i.e., Lake Sibayi and the wetland areas) due to the risk of pollution.

Changes in water quality

Proposed mitigation measures

Implementation of all the mitigation measures listed under the preceding impact descriptions, i.e., 'Pollution of soils and habitat', and 'Soil erosion and sedimentation' in this report, and the mitigation measures outlined in the Freshwater Resource Assessment for the Proposed Mabibi Abstraction and Packaging Plant, KwaZulu-Natal, dated June 2024, must be implemented.

Operational phase

Direct impacts

Disturbance of local fauna

Proposed mitigation measures:

- ❖ Restrict maintenance vehicles to existing roads.
- ❖ No off-road driving is to be permitted.
- ❖ Restrict maintenance activities to the pipeline servitude and the development footprint of the water treatment plant.
- ❖ No wild animal may under any circumstance be handled or be interfered with.
- ❖ No wild animal may under any circumstance be hunted, snared, captured, injured, or killed. This includes animals perceived to be vermin such as rodents as these animals serve as prey species for several avian, mammalian and reptilian species.
- ❖ The feeding of wildlife must be strictly prohibited.
- ❖ The handling and removal of any venomous species such as snakes must be strictly prohibited. Should any such species be encountered, a qualified and experienced professional with experience in snake handling and removal must be contacted immediately.
- ❖ Should repair work be required, the construction phase mitigation measures as set out in this report must be implemented.

Indirect impacts

Re-invasion and spread of alien invasive plant species

Proposed mitigation measures:

Implementation of an ongoing alien invasive plant management and monitoring plan to control and prevent the spread of alien invasive species in the development footprint. The following management actions are aimed at reducing the abundance of alien species within the site and maintaining non-invaded areas clear of aliens.

- ❖ Surveys for alien species should be conducted regularly (every three months for the first year after construction and biannually thereafter). All aliens identified should be removed from site.
- ❖ Revegetation with indigenous, locally occurring species should take place in areas where natural vegetation is slow to recover or where repeated invasion has taken place.
- ❖ No alien species should be cultivated onsite. If re vegetation is required, only indigenous, waterwise and locally occurring species must be used.

The following monitoring and evaluation actions should take place during the operational phase of the development.

- ❖ Document invasive alien species and distribution over time.
- ❖ Document and record alien control measures implemented, and success rate achieved.
- ❖ Review and evaluation of control success rate.
- ❖ Monitoring of revegetated areas.

Refer to **Appendix D2** – Terrestrial Biodiversity, Fauna and Flora Assessments

The following outcomes must be considered as per the Climate Change Impact Report:

Measures to mitigate effects of the proposed scheme that may affect the landscape as well as the vegetation are recommended. The following recommendations of mitigation measures can be included within the design of the proposed Mabibi Water Supply Project, this may include consideration given to ensuring

- ❖ Restoration of the ecological make-up disturbed during the implementation of the scheme in the area back to its initial conditions.
- ❖ Retention of the landscape plantations and soils removed to make way for the pipeline of the project. There are chances that the current landscape and vegetation of the area around Lake Sibayi may also be a contributing factor to the water balance depicted by the models even at increasing global temperatures.

Refer to **Appendix D3** – Climate Change Impact Assessment

The following outcomes must be considered as per the Wetland impact Assessment:

Monitoring requirements

- ❖ Soils and sands from excavation activities of the development must be stockpiled away from drainage, and possible drainage, areas.
- ❖ The contractor is to ensure that should there be any excessive quantities of sand, silt and silt-laden water, it does not enter the storm water system.
- ❖ Stormwater management design and erosion control measures, with the implementation of reno mattresses or gabions around the established abstraction point and crossing points of the reticulation path..
- ❖ The ECO and staff should monitor and report any benthic disturbances on account of stormwater inputs and surface run-off.
- ❖ The contractor is to ensure that should there be any excessive quantities of sand, silt and silt-laden water, it does not enter the storm water system.
- ❖ Soil and spoil must not be stored within 100m of the watercourse (may be reduced at the discretion of the ECO).

- ❖ Excavated material is recommended to be placed on the upstream side of the trench so that should any excavated material be displaced during rainfall; it will flow back into the trench rather than towards the watercourse.

Hazardous, human and general waste introduction

- ❖ Personnel should not use watercourses for sanitation purposes. Ablution facilities should be made available in close proximity to active work areas, but outside the riparian/wetland buffer boundaries.
- ❖ Solid waste (including plastics, polystyrene, etc.) is expected to build up during the construction phase. This should be considered and managed accordingly. Recycling should be promoted. Appropriate waste storage facilities must be provided on site during the construction phase.
- ❖ Waste storage should be located outside the aquatic resource buffer zones.
- ❖ The ECO and staff should monitor and report any introduction of hazardous, human and/or general waste into/in proximity of the aquatic resource.
- ❖ Contaminated water needs to be isolated. Water with a chemical signature different to that of the receiving aquatic environment should be considered contaminated and should be isolated and treated before discharged into the watercourse.
- ❖ Alternatively, irrigation water run-off should be collected and fed back to irrigation dams for re distribution.
- ❖ Appropriate measures such as the implementation of silt and litter traps, or areas to contain silt before entering the watercourse, such as sedimentation basins.

Flow modification

- ❖ Filtration sieves should be fixed to the proposed abstraction pipes to avoid the potential desiccation of fish species
- ❖ Construction and operational activities should not impact negatively on the flow of the aquatic resource; an ecological water reserve should be calculated by a qualified geohydrologist.
- ❖ No impeding flow other than for the approved activities.

Refer to **Appendix D4** – Freshwater Resource Assessment

The following outcomes must be considered as per the Groundwater Assessment:

- ❖ Equipping of the boreholes should be carried out in accordance with the installation depths and abstraction rates for the recommended duties as specified in the groundwater management plan.
- ❖ Various water treatment options can be considered for the compounds of concern identified during the assessment.
- ❖ In some instances, affected boreholes should be chlorine shock treated and resampled to assess if micro biological counts of E. coli and total coliforms persist.
- ❖ Additional treatment options for elevated metals include reverse osmosis, ion exchange, oxidation and filtration.
- ❖ Treatment should be implemented at the reservoir distribution points to minimise treatment costs at multiple treatment points.
- ❖ Further, dilution of multiple input sources may improve the overall water quality and reduce the treatment requirements and costs.

Refer to **Appendix D5** – Groundwater Implementation Report

The following outcomes must be considered as per the Groundwater Assessment:

All earthworks should be carried out in a manner to promote stable development of the site. It is recommended that earthworks be carried out along the guidelines given in SANS 1200 D (current version).

- ❖ It is recommended that excavations be carried out in the dry season i.e. from approximately May to August as far as possible and backfilled with the minimum of delay.
- ❖ Lateral support such as sheet piling to engineer's detail should be implemented where unstable trench sidewalls exacerbated by the observed shallow groundwater condition, are identified. The potential for sheet piling is the greatest in the general area of Lake Sibayi.
- ❖ It is considered that materials meeting the requirements for Selected Granular Material will have to be imported to the site.
- ❖ It is considered that samples of the aeolian materials meet the requirements for use as Select Fill to the proposed pipeline, subject to laboratory verification during construction.
- ❖ Foundations placed on the collapsible, loose colluvial, alluvial, and aeolian soils are likely to undergo excessive settlement and potentially experience bearing capacity failure even under light to moderate applied loads.
- ❖ The loosely consolidated sandy colluvial, alluvial, and aeolian soils are also likely to exhibit a collapse settlement mechanism i.e. secondary compression settlement due to an increase in moisture content under a constant applied load.
- ❖ If bearing pressures can be limited to 100kN/m², consideration may be given to founding the proposed Pump Station foundation on engineered rock fill with allowance for shoring or sheet piling to facilitate excavations with unstable sidewall conditions (Founding Option 2).
- ❖ A detailed geotechnical design is required for ground improvement forming part of Founding Options 1 and 2.
- ❖ For building structures supporting high foundation pressures and / or settlement-sensitive structures, consideration should be given to the use of pile foundations (Founding Option 3).
- ❖ Provision should be made for dewatering well points at the site for the proposed Pump Station.
- ❖ Suitable water-proofing measures to design by a water waterproofing specialist are advised for the Pump Station and Package Water Treatment Works.
- ❖ It is imperative that earthworks and drainage measures be designed in such a way as to prevent ponding of, or high concentrations of, stormwater or groundwater anywhere on the site and include effective erosion and anti-siltation controls, both during and after the development, to engineer's detail.
- ❖ The ground conditions given in this report refer specifically to the field tests carried out on site. It is, therefore, quite possible that conditions at variance with those given in this report could be encountered elsewhere on site during construction.
- ❖ Should the proposed structures be supported on piles, then a deeper geotechnical investigation is required for the design of piles that should comprise at least one rotary core borehole with standard penetration tests advanced to prove either 5m of competent rock or to a final depth of 20m (dependant on foundation loads and soil conditions).
- ❖ It is important that Geosure be appointed to carry out periodic inspections during construction. Any change from the anticipated ground conditions could then be taken into account to avoid unnecessary expense.
- ❖ The feasibility of employing one or more soakaways on site for the disposal of stormwater by an attenuation system and subsoil percolation will depend on engineering analysis under an extension of the completed brief of Geosure.

Refer to **Appendix D6 –Geotechnical Investigation**

The following outcomes must be considered as per the Heritage Impact Assessment And Desktop Palaeontological Impact Assessment:

The following recommendations and mitigation measures are applicable to the two grave sites identified along the bulk water pipeline route:

- ❖ It is recommended that both of the graves be left in-situ on the site. More specifically, a minimum of a 15m no-development buffer is recommended around the boundary of each grave, as shown in Figure 10 below.
- ❖ The final bulk water pipeline servitude must be aligned to avoid both of the grave sites, including the 15m no-development buffer.
- ❖ The position of the grave sites and 15m buffer must be shown on all the relevant construction plans to ensure that all staff and contractors are aware of the presence of these sites.
- ❖ No construction activities must take place within the no-development buffer zone, and no construction materials or site camp infrastructure must be placed in the buffer zone.
- ❖ It is highly unlikely that any of these graves will be negatively impacted by the proposed bulk water supply project as the bulk water pipeline and other infrastructure will not deviate onto the private properties where such graves are located. However, should it become necessary to install any of the infrastructure in close proximity to a grave, then the heritage consultant must be contacted prior to any activity commencing to ensure that the necessary mitigation measures are implemented as follows.
- ❖ A 10m no-development buffer must be applied around the grave and the water supply infrastructure must be aligned to avoid the grave and the 10m no-development buffer.
- ❖ No grave may be damaged, altered, exhumed, or removed without an application being undertaken to the KwaZulu-Natal Amafa and Research Institute for the damage, alteration, exhumation, or removal of a grave as provided for in Section 5 of the Draft KwaZulu-Natal Amafa and Research Institute Regulations, 2021.

Refer to **Appendix D7-** Heritage Impact Assessment And Desktop Palaeontological Impact Assessment

The following outcomes must be considered as per the Floodline Assessment:

- ❖ The client must be made aware of the estimated 1:10 year, 1:50 year & 1:100 year flood lines & flood levels.
- ❖ Should there be any embankments and retaining structures within the floodplain, these should be appropriately designed to withstand the hydraulic forces of the flood waters.
- ❖ It is recommended that the proposed Mabibi Water Supply be constructed in such a manner to ensure minimal impact or obstruction to the natural watercourse / Lake Sibayi.
- ❖ The client must be willing to take full responsibility and accept any risks associated with the proposed Mabibi Water Supply.
- ❖ Runoff flow for the various return periods was calculated by using both the Alternative Rational method and Standard Design Flow for the pre-development conditions.
- ❖ Adequate compaction and stabilisation on embankments. Erosion control to be designed by others.
- ❖ The flood lines & flood levels should be inserted on all relevant drawings (flood levels taking preference over flood lines due to limited survey).
- ❖ The watercourses to be re-analysed if any changes occur in the geometric configuration of the river or additional infrastructure or/and controls are introduced into the system.
- ❖ An ongoing maintenance/management plan should be in place to ensure that this portion of the watercourse along the project area is kept free of silt and debris, so as not to increase the flood levels.

Refer to **Appendix D7-** Floodline Assessment Report

6.5. Assumptions, Uncertainties and Gaps in Knowledge relating to the Assessment and Mitigation Measures Proposed as per Section 3(o)

The information in this report is based on the findings of several specialists' studies. The following assumptions and limitations relating to this assessment were identified by specialists:

Agricultural Impact Assessment

The following aspects were considered as limitations of the assessment:

- ❖ Hand augers were used, and the limiting layer was the depth to which the auger could drill;
- ❖ The assessment is based on the design and layout information provided by the client;
- ❖ It has been assumed that the extent of the development area provided by the responsible party is accurate; and
- ❖ The GPS used for ground truthing is accurate to within five meters. Therefore, the observation site's delineation plotted digitally may be offset by up to five meters to either side.

Ecological Impact Assessment

The following limitations applied to the studies undertaken for this report:

- ❖ This report deals exclusively with the proposed development footprint and the potential impacts associated with the land use change on terrestrial biodiversity, animal and plant species.
- ❖ The assessment of potential impacts was informed by site-specific environmental conditions at the time of the site visit and ecological concerns based on the investigator's working knowledge and experience with similar projects.
- ❖ Information used to inform the desktop assessment was limited to data and GIS coverage's available for the province at the time of the assessment and was assumed to be correct.

Climate change Assessment

- ❖ Data/information provided by the client was assumed to be accurate and complete at the time of submission of this report;
- ❖ Material throughputs were based on information provided by the client.
- ❖ The study is limited by the amount of detailed information that could be provided at the time of compilation of the report;
- ❖ Climate is changing, and what is occurring at the site location now is not necessarily what will be happening in 5 to 10 years' time. Research is continuously being undertaken to establish the potential spatial relationship between activities and climate change.

Heritage Impact Assessment

It is difficult to apply pure scientific methods within a natural environment without limitations or assumptions.

The following apply to this study:

- ❖ No privately owned properties/homesteads were accessed during the Phase 1 HIA and Desktop PIA study. These properties were assessed from the outside, along the property boundaries. Heritage/palaeontological site visibility may have been compromised.
- ❖ Heritage/palaeontological resources may be present below the surface. No subsurface investigations were undertaken as part of the Phase 1 HIA and Desktop PIA.
- ❖ The findings, results, observations, conclusions, and recommendations provided in this report are based on the authors' best scientific and professional knowledge as well as available information regarding the perceived impacts on heritage/palaeontological resources.
- ❖ The study results are based on a single day field investigation. Once-off assessments such as this may potentially miss certain heritage information, thus limiting accuracy, detail, and confidence.
- ❖ Any additional information used to inform the assessment was limited to data and GIS data sets which were available for the area at the time of assessment.

6.6. Period for which Authorisation is required, Proposed Monitoring and Auditing and Post Construction Requirements as per Section 3(q)

2014 NEMA EIA Regulations (As Amended), Appendix 1- 3(Q) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post-construction monitoring requirements finalised.

Based on the time required for the applicant to undertake all necessary planning processes governing the establishment of the Mabibi Package WTP, it is recommended that the Environmental Authorisation is granted for a period of ten (10) years, which will also take into account any unexpected events.

Given the nature of this project, external environmental audits of the activity and implementation of the EMPr will be undertaken by the independent ECO. The findings and outcomes of these audits will be recorded in the ECO Reports and filed in the Environmental file. The environmental audits and associated reports must be conducted and submitted to the CA at intervals as indicated in the EA.

The EMPr (Appendix G) details the pre-planning, construction, post-construction and rehabilitation phases, which will be monitored by the ECO and compliance authorities. One post-construction audit should be conducted once construction is complete. Thereafter an annual audit should be conducted every two years in order to ensure that the post-construction and rehabilitation outcomes have been achieved.

6.7. Financial Provisions as per Section 3(s)

2014 NEMA EIA Regulations (as amended), Appendix 1- 3(S) where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts.

N/A

6.8. EAP's Opinion on whether or not to Authorise the Activity and Recommendations & Conditions for Authorisation as per Section 3(n) and (p)

2014 NEMA EIA Regulations (as amended), Appendix 1- 3(N) any aspects which were conditional to the findings of the assessment either by EAP or specialist which are to be included as conditions of authorisation and (P) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation.

It is the opinion of the EAP, that the proposed development be approved as:

- The Mabibi Water Supply Scheme has been proposed in direct response to the severe and persistent water supply challenges experienced within the uMhlabuyalingana Local Municipality, under the jurisdiction of uMkhanyakude District Municipality. Currently, many communities within the Mabibi area rely on groundwater abstraction through communal boreholes and house-hold level rainwater harvesting, which are often unreliable, of poor quality, and insufficient to meet basic domestic demands. Seasonal variability, declining groundwater levels, and increased population pressures have exacerbated the situation, leading to frequent water shortages and significant service delivery backlogs.
- The uMngeni-uThukela Water has therefore proposed the Mabibi Water Supply Scheme to regulate potable water supply to the Mabibi community. The project proposes the abstraction of water from Lake Sibayi, which will then be treated at the proposed Mabibi Package Water Treatment Plant, and distributed to the Mabibi community.
- uMkhanyakude District Municipality's (UKDM) Universal Access Plan Phase 3 proposes that the Mabibi area be supplied from Jozini Dam through the Jozini Regional Water Supply Scheme. The primary water source for the water supply scheme is Pongola Dam. Raw Water abstraction is currently at 37ML/day and is earmarked to be upgraded to 80ML/day in the future to accommodate other areas in Umhlabuyalingana LM and including the Mabibi area. The infrastructure required will eventually deliver

raw water supplies to the Mabibi area. **It is important to note that once the water supply reaches the Mabibi area, this abstraction method will be implemented.**

- The impact assessment conducted for this site shows that all identified impacts associated with the construction and post-construction phases can be mitigated to acceptable levels provided that the site specific EMPr and specialist recommendations are strictly adhered to. These measures have been incorporated into the EMPr, which also makes provision for the monitoring and auditing thereof, as well as environmental awareness training for all persons who will be conducting the activity.
- Once construction is complete, rehabilitation and landscaping must be undertaken with indigenous vegetation.

It is thus the EAP's opinion that the activity for which environmental authorisation is being sought, is authorised provided that it is undertaken in accordance with the Alternative A1 (Preferred Site Alternative), Alternative D1 (Preferred Rising Main Route) and Alternative T1 (Short-term Water Abstraction from Lake Sibayi).

Properties and Infrastructure:

- Signage must be placed prior to the commencement of construction to make the community aware of the upcoming activities.
- The engineer must identify any existing infrastructure services that may be affected prior to commencement of construction.
- Any structures that are required to be removed must be replaced, and any damage incurred must be repaired.

Waste Management, Storage Areas:

- The Contractor must ensure that all litter is collected from the work and camp areas daily.
- All hazardous substances must be stored within a secured storage area, with impervious lining and bunding.
- Drip trays must be used where suitable.
- The mixing of concrete must be done on plastic sheeting, mortar boards or similar structures to prevent the risk of run-off.
- Chemical toilets must be used as ablution facilities during the construction period by all contractors.

Traffic and Construction Vehicles:

- Appropriate safety signage must be used to cordon off construction areas.
- Construction vehicles must adhere to speed limits.
- Access to the site for site establishment and construction activities must be planned from the existing access routes.

Dust and Erosion Control:

- The liberation of dust into the surrounding environment must be effectively controlled by the use of water sprays, water carts, fabric containment or curtains, where required.
- Suitable erosion control measures must be implemented in areas sensitive to erosion, i.e., stormwater discharge points, exposed areas and embankments.
- All exposed surfaces must be re-vegetated and stabilised as soon as is practically possible.

Monitoring and Auditing:

- The EMPr (Appendix G) and conditions thereto must be adhered to.
- An ECO must be appointed and all contractor staff to be trained on the EMPr and Environmental Authorisation requirements prior to commencement of activities.
- Environmental monitoring and auditing shall be undertaken by the Independent ECO on a frequency as to be determined by the competent authority.