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DRAFT BASIC ASSESSMENT REPORT

DC27/0005/2021: KZN/EIA/0001543/2021

The proposed sewer pump station and gravel access road in support of the existing Nordale Wastewater Works upgrade, within the Mtubatuba Local Municipality, uMkhanyakude District, Kwazulu-Natal Province.

MAY 2021

Prepared by:

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Prepared for:

M & C Consulting Engineers (PTY) Ltd.

On Behalf of:

King Cetshwayo District Municipality

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LIST OF ACRONYMS

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

GLOSSARY OF ITEMS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

WATERCOURSE: can be a) a river or spring; b) a natural channel or depression in which water flows regularly or intermittently; c) a wetland, lake or dam into which, or from which, water flows; and/or d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse as defined in the National Water Act, 1998 (Act No. 36 of 1998) and a reference to a watercourse includes, where relevant, its bed and banks.

WETLAND: the land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and

which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.

INDIGENOUS VEGETATION: refers to vegetation consisting of indigenous plant species occurring naturally in an area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years.

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

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

GENERAL WASTE LANDFILL SITE: a waste disposal site that is designed, managed, permitted and registered to allow for the disposal of general waste.

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

INTERESTED AND AFFECTED PARTY (I&AP): for the purposes of Chapter 5 of the NEMA and in relation to the assessment of the environmental impact of a listed activity or related activity, an interested and affected party contemplated in Section 24(4) (a) (v), and which includes (a) any

person, group of persons or organization interested in or affected by such operation or activity; and (b) any organ of state that may have jurisdiction over any aspect of the operation or activity.

EXECUTIVE SUMMARY

The uMkhanyakude District Municipality proposed the construction of sewer pump station and gravel access road in support of the existing Nordale Wastewater Works upgrade, Within the Mtubatuba Local Municipality, uMkhanyakude District, Kwazulu-Natal Province.

The proposed development entails the construction of the following: 7900m^2 perimeter fencing; 85.52m^2 sewer pump station building with a capacity of 560 m^3/day; 26.92m^2 operator house; 7787.56m^2 site paving with crusher stones; and 300m long and 3.7m wide Gravel Access Road.

The overall proposed development footprint is 0.901 ha, within ERF: 465, Nordale, Matubatuba.

Emvelo Quality and Environmental Consultant have been appointed by M & C Consulting Engineers (PTY) Ltd. on behalf of uMkhanyakude District Municipality (the applicant), as the independent Environmental Assessment Practitioner (EAP), to facilitate the Basic Assessment Processes required in terms of the National Environmental Management Act (NEMA, Act 107 of 1998) for this application.

The NEMA, and the Environmental Impact Assessment (EIA) Regulations (2014) as amended in 2017, govern the process of applying for environmental authorization for certain developments. A provision in the EIA Regulations is made for two forms of assessment: Basic Assessment and Scoping & EIA, depending on the scope of the activity. The EIA regulations specify that: Activities identified in Listing Notice 1 and 3 (GNR 327 and 324 of 2017) requires a Basic Assessment while activities identified in Listing Notice 2 (GNR 325 of 2017) are subject to a Scoping and EIA. This application will follow a Basic Assessment. The listed activity associated with the proposed development is Listing Notice 1, Activity 12; Listing Notice 3, Activity 12 and 14.

After weighing all project alternatives for this project, the “Location Alternative” was considered highly feasible and adopted to consider the major development alternative that would meet the stated need for and purpose of the project, by providing proper mitigation measures.

The Public Participation Process (PPP) has, to date, included: displaying onsite notices, placing of an advertisement in the Bay Watch Newspaper (isiZulu and English newspaper), and distribution of Background Information Documents (BIDs).

1 INTRODUCTION

Emvelo Quality and Environmental Consultant has been appointed by M & C Consulting Engineers (PTY) Ltd, on behalf of uMkhanyakude District Municipality, to undertake an Environmental Impact Assessment (EIA) for the proposed sewer pump station and gravel access road in support of the existing Nordale Wastewater Works upgrade, within the Mtubatuba Local Municipality, uMkhanyakude District, Kwazulu-Natal Province.

This will include the facilitation of the Basic Assessment Processes as required in terms of the NEMA for this application.

2 PROJECT TITTLE

The proposed sewer pump station and gravel access road in support of the existing Nordale Wastewater Works upgrade, within the Mtubatuba Local Municipality, uMkhanyakude District, Kwazulu-Natal Province.

3 PROJECT DESCRIPTION

Nordale Sewer Pump station with a capacity of 560 m^3/day and associated 300mx3.7m gravel access road within Mtubatuba Local Municipality.

The construction activities entail: Bulk excavation works for the pump station building for installation of a reinforced concrete wet well at approximately 5m below Existing Ground Level (EGL) excavated with a batter (min 45°) to guard against the risk of collapse; Dewatering the wet well area if necessary for the duration of wet well construction in case of shallow ground water levels and/or accumulated rain water; Steel fixing and shuttering for the wet well floor slab and walls; Concrete pouring from ready mix concrete suppliers; Brickworks and roofing for a 85.52m^2 sewer pump station building with a pump capacity of 560 m^3/day and associated 26.92m^2 operator house; Site levelling and 7787.56m^2 site paving with crusher stones within the vicinity of the pump station; Installation of a 7900m^2 perimeter fencing; And construction of a 300m long and 3.7m wide gravel access road.

The overall proposed development footprint is 0.901 ha, within site ERF: 465, Nordale, Matubatuba.

4 PROJECT LOCALITY

The proposed Nordale Sewer Pump station and associated gravel access road is situated within the jurisdiction of Mtubatuba Local Municipality, uMkhanyakude District, Kwa-Zulu Natal.

The site is situated at outskirt of Mtubatuba Town next to Nordale Township approximately 3km North-East of the town.

Figure 1 provides the geographical context of the proposed development site, in relation to major towns or cities within the municipality.

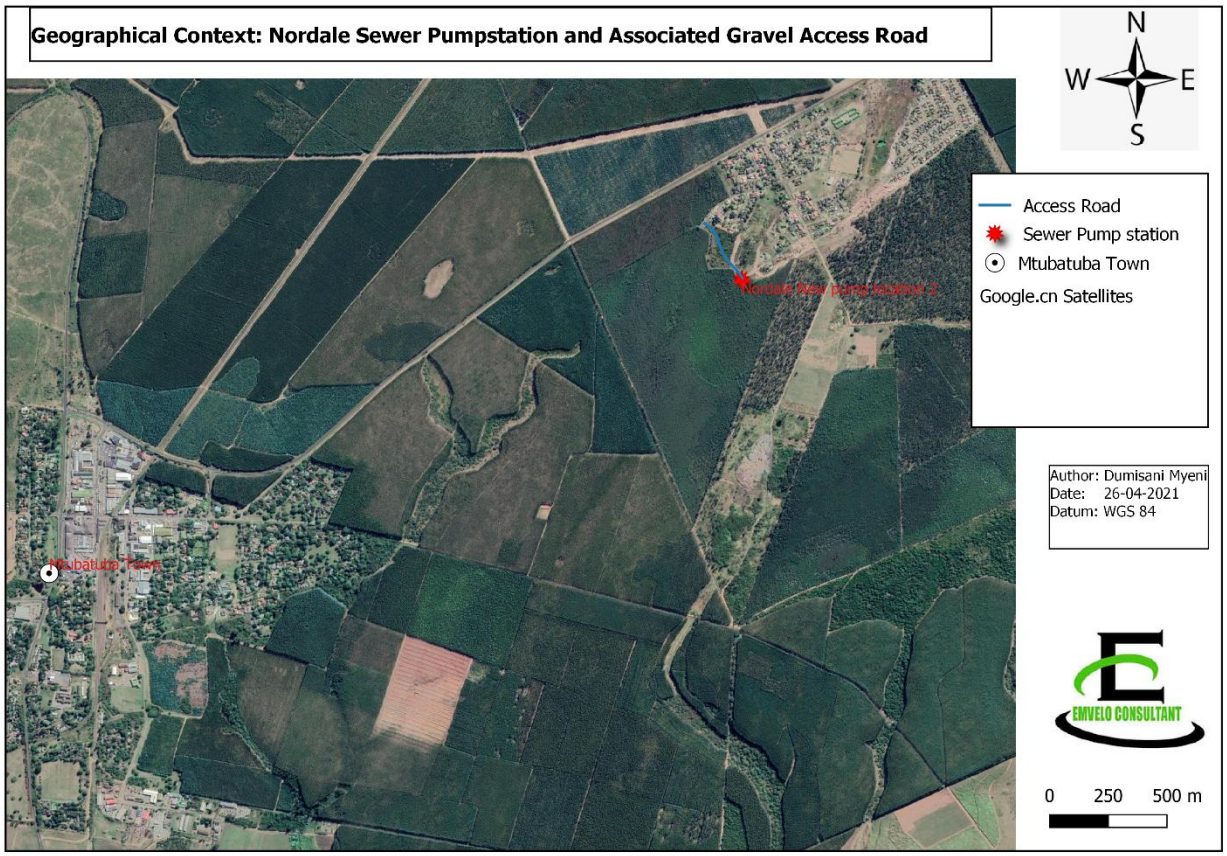

Figure 1: Geographical Context for Proposed Nordale Sewer Pump station and Access Road

The (***Table 1***) below, provides the Global Positioning System (GPS) co-ordinates for the proposed development site.

Table 1: Co-ordinates

Nordale Sewer Pump Station and Associated Gravel Access Road			
Latitude & Longitude	Degrees	Minute	Seconds
South	28°	24'	12.21''
East	32°	12'	47.60''

The (***Table 2***) below, provides the 21-digits Surveyor General Code (SGC).

Table 2: 21-digits Surveyor General Code

N	O	G	V	0	2	2	0	0	0	0	0	0	6	4	4	0	0	0	0	0

The (***Figure 2***) below, is the locality map for the proposed development. The map also depicts wetlands coverage across the project area and in the proximity of the project site.

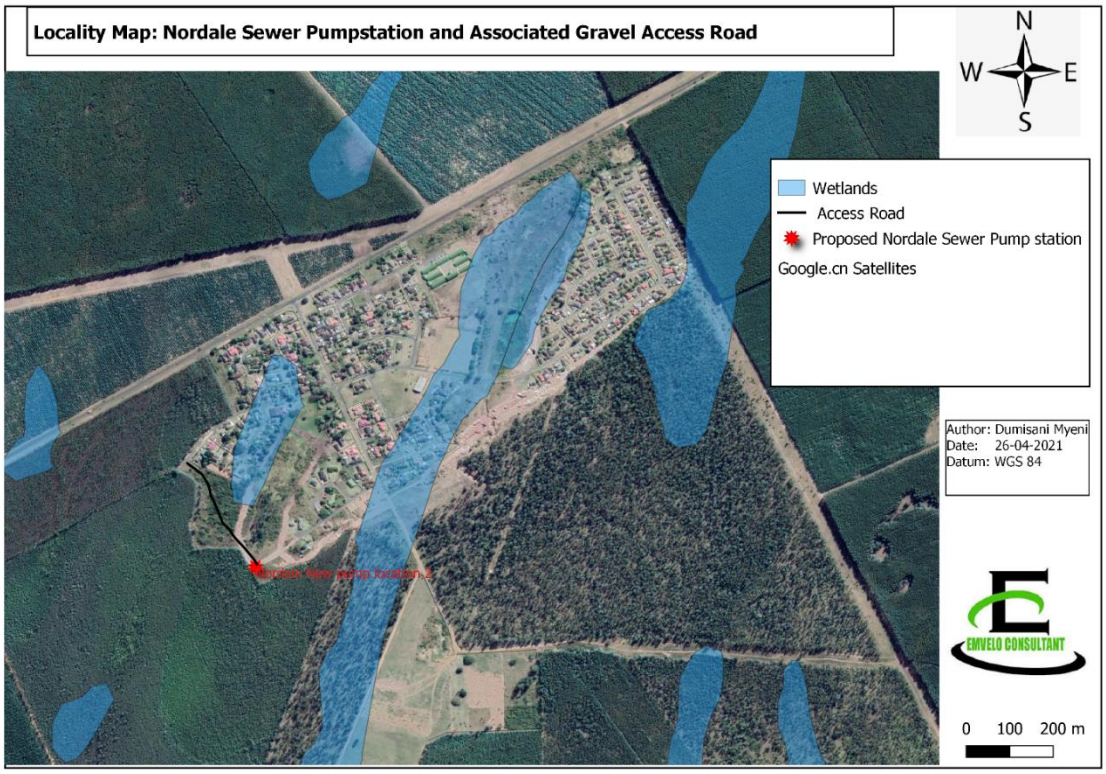

Figure 2: Locality map of the project area

5 SITE ACCESS

The site can be accessed via P237 from N2 in Mtubatuba, travel for 2.3km, then turn left and continue on the P237 for 1.1km, then turn right into R618 and continue on the route for 3.6km to Nordale. In Nordale turn right onto the Eagle drive, and after 600m, you turn right into an unnamed street, then continue for 210m and you arrive at the project site.

6 ACTIVITY MOTIVATION

The town of Mtubatuba current faces sewer challenges, owing to inadequate sewer infrastructure. Therefore, to minimise the risk of waterborne diseases, environmental and water resources pollution emanating from the raw sewage spillages within the 'problematic' areas, the construction of Nordale Sewer Pump Station was proposed. This sewer pump station will be accompanied by a gravel access road as associated infrastructure for site accessibility during operation and maintenance.

6.1 The need

The adequate, effective and sustainable sewer and water infrastructure management is critical for decent livelihood and health promotion, as described by (NPC, 2012; WHO, 2018). Also, the uMkhanyakude District Municipality has placed the Sanitation/Sewerage as one of the Key Performance Area (KPA) on Municipality's Performance Management System (PMS) in terms of service delivery (uMkhanyakude IDP, 2019/2019). As a result, the uMkhanyakude District Municipality proposed the construction of Nordale Sewer Pump station within Mtubatuba Municipality to offer support to sustainable technical solutions which will eradicate the current sewer challenges. Thus, this will address the current sewer crisis faced by community of Mtubatuba Town, owing to current inadequate sewer pump system to meet operational requirement and to cater for growing population.

Also, the Nordale Township at the outskirt of Mtubatuba Town consists of 403 erven, of which and 194 are serviced with a waterborne sanitation network, with the remainder of 209 are served by septic tanks. Therefore, this of 209 erven within Nordale Township is currently posing operational challenges to the uMkhanyakude District Municipality due to inadequate vacuum tankers for servicing the septic tanks.

Therefore, based on the above-mentioned factors, the proposed development is needed by the affected community, as without this project their livelihood will continue to be affected as this poses environmental health hazard within Mtubatuba Town, and Nordale Township in particular.

6.2 Desirability

The upgraded sewer system through construction of Nordale Sewer Pump Station will see the efficient and adequate sewerage system operations, and improve livelihood and promotion of health, as the environmental health hazard caused by sewer blockage and overflow will be eliminated. Thereby, eradicating the risk of waterborne diseases emanating from the raw sewage spillages within the 'problematic' areas, and also eradicating the risk of environmental and water resources pollution as a result of the raw sewage spillages within the prioritised areas of Mtubatuba Local Municipality. Also, the construction of gravel access road will provide access to pump station during operation and maintenance.

In addition, the Nordale Sewer Pump Station will see the connection of 209 erven at Nordale Township which are currently serviced by a household's septic tanks. Thereby, upgrading to a full waterborne sanitation system that will be connected to this new pump station.

It must also be noted that, the inclusion of local labour during the construction period will create the much-needed temporary employment opportunities and transfer of skills to host community. Also, there could be full time employment in case of pump station operation.

7 DESIGN CRITERIA

The proposed Nordale Sewer Pump Station has been designed in accordance to Human Settlement Planning and Design Guidelines, by calculation of Average Dry Weather Flow (ADWF) which determine the average daily flow emanating from each property within the project area during dry weather conditions when there is no rain water ingress. Design also, included a wet well separated from a dry well where the pumping equipment is housed. Both the wet well and the dry well are located below the Existing Ground Level (EGL) and will be constructed using reinforced concrete.

The peak factors for the pumping capacity for the reticulation network were taken from the guidelines for Human Settlement Planning and Design (Red Book). Peak factors of between 3.5 to 2.65m/s were used for determining design flow rates, with 15% allowance for storm water infiltration incorporated in the designs.

7.1.1 Residential

The following (***Table 3***) presents the calculation of Average Dry Weather Flow (ADWF) which determine the average daily flow emanating from each property within the project area during dry weather conditions when there is no rain water ingress in terms of average daily flow per household.

Table 3: ADWF Per Single Dwelling Unit

Income Group	Lower	Middle	Higher
Litres per dwelling unit per day	869.360	-0.650 m	
Based on average total persons per dwelling unit	870.140	0.140 m	

7.1.2 Non-Residential (Public and Commercial)

The following (***Table 5***) outlines the criteria that was used for non-residential and other special residential areas:

Town Planning Zone	Description	Ultimate Wastewater Flow (kl/ha/d)
Commercial	Business amenities	40
Education	Schools	10
Communal Residential	Multi-storey flats and complexes (Max 25 units/ha)	15
Multi Use Retail 1	Malls and shopping centres	40

7.2 Pump station pumping capacity

Based on the results of the evaluation of the Nordale Sewer Pump station, the following design is required to restore the sewer reticulation to an acceptable level of operation to withstand challenges resulted by flat terrain and slope gradients.

The Nordale Sewer Pump stations pumping rate is determined to be ***13.05 l/s***, with capacity of ***560 m^3/day***. Moreover, this pump station be will be designed to pump a design flow which is based on the anticipated ultimate peak wet weather inflow for the catchment, and be equipped with a standby pump with the same capacity as the duty pump(s). With the minimum velocity allowed in the pumping main for self-cleansing is 0.7m/s for self-cleansing and maximum of 2m/s in the pumping main to avoid excessive surge pressures is 2m/s.

The size of the pump station sump was calculated based on the following criteria:

- The volume between pump cut-in and cut-out (active sump volume) has been determined using the design pump capacity and has been set to generally limit the frequency of pump starts per hour to six;
- The sumps will be designed to ensure that sewage is not retained in the sump and pumping main for more than 2 hours during daylight hours, but large enough to ensure the pumps operate correctly.

7.3 Gravel access road in support of operation and maintenance

The design for 300m long and 3.7m wide Gravel Access Road in support of operation and maintenance requirement for the Nordale Sewer Pump station has been designed in accordance to DoT local road standard.

A G7 wearing course is recommended placed between 150 to 200mm thick to minimise wearing and excessive road maintenance.

The road drainage will be done according to the Road Drainage Manual and DOT requirements. As the project locality comprise of very flat terrain the Mitre drains will be provided at intervals 100m intervals, where required.

8 SITE ALTERNATIVE

The Department of Environmental Affairs provides guidelines on the assessment of alternatives, to which the impact assessment be considered DEAT (2004a) and DEAT (2006). These alternatives are: location (site), activity (project), site layout, design, scale, routing, scheduling, process, demand, input and no-go alternatives. It is, however, important to note that the regulation and guidelines specifically state that only 'feasible' and 'reasonable' alternatives should be explored. It also recognizes that the consideration of alternatives is an iterative process of feedback between the applicant and the appointed Environmental Assessment Practitioner (EAP), which in some instances culminates in a single preferred project proposal.

After weighing all project alternatives for this project, the "Location Alternative" was considered highly feasible and adopted to consider the major development alternative that would meet the stated need for and purpose of the project, by providing proper mitigation measures.

8.1 Alternative A (Preferred Location Alternative)

This project merely aims at upgrading the sewer pump capacity thereby, construction of Nordale Sewer Pump station to augment the existing sewer system within Mtubatuba Town. Therefore, the preferred alternative for the proposed development is the "Location Alternative". This alternative involves looking engineering constraints that may prevent other locations from being considered to meet the operational requirement, thereby providing the impact likelihood and mitigation measures for the preferred location.

This preferred "Location Alternative" proposes that, for efficient and adequate operation of sewer system, the pump station should be placed at the lowest point of the slope gradient within project area. In addition, the proposed site is in proximity to Nordale Township which has 209 erven which are currently not connected to waterborne sanitation network but rather with individual households' septic tanks. Therefore, this "Location/Site alternative" is proven to be two folds: As it is a downs gradient location for efficient and adequate operation of sewer system; And at proximity to 209 erven to be added in municipal sewer infrastructure (reticulation system) which will minimise connection construction cost and environmental impact as a result of vegetation clearance and excavation laying of the bulk sewer pipeline route for the new sewer connection (***Refer to Section 6.2***).

Therefore, the aforementioned highlights alternative A (Location/Site Alternative) as the only best feasible and suitable alternative for this project, as it is the only alternative that would meet the stated need and operational requirement and purpose of the project.

8.2 Alternative B (No-Go Alternative)

In the absence of the proposed development, the community of Mtubatuba Town will continue to experience sewer reticulation challenges as the current status quo does not meet operational demand (***Refer to Section 6.1& 6.2***). Therefore, projects that are proposed on public land and/or for the public good should consider the major development alternatives that would meet the stated need for and purpose of the project (DEAT, 2004a).

Furthermore, access to adequate, effective and sustainable sewer and water infrastructure management is critical for decent livelihood and health promotion, it is a national priority in promotion of local economic development and one of the key elements of a decent standard of living for all South Africans (NPC, 2012). The EAP is therefore, of the view that the NO-GO option is undesirable in the face of social and economic needs of this community and South Africa's National Development Plan 2030 objectives.

9 APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

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

Table 4: Environmental Statutory Framework

Legislation	Relevance
Constitution of the Republic of South	➢ Chapter 2 – Bill of Rights. ➢ Section 24 – Environmental Rights.

Africa, (No. 108 of 1996)		
National Environmental Management Act (NEMA) (No. 107 of 1998)	➢ Section 24 – Environmental Authorisation (control of activities which may have a detrimental ➢ effect on the environment). ➢ Section 28 – Duty of care and remediation of environmental damage. ➢ Environmental management principles. ➢ Authorities – Department of Environmental Affairs (DEA) (national) and Department of Economic Development Tourism and Environmental Affairs (provincial).	
GN No. 326 (7 April 2017)	➢ Purpose - regulate the procedure and criteria as contemplated in Chapter 5 of NEMA relating to the preparation, evaluation, submission, processing, and consideration of, and decision on, applications for environmental authorisations for the commencement of activities, subjected to EIA, in order to avoid or mitigate detrimental impacts on the environment, and to optimise positive environmental impacts, and for matters pertaining thereto.	
➢ Purpose – to identify activities that would require environmental authorizations prior to commencement of that activity and to identify competent authorities in terms of sections 24(2) and 24D of NEMA. ➢ The investigation, assessment, and communication of the potential impact of activities must follow the procedure as prescribed in regulations 19 and 20 of the EIA Regulations published in terms of section 24(5) of the Act. However, according to Regulation 15(3) of GN No. 327, Scoping and an Environmental Impact Report (S&EIR) must be applied to an application, if the application is for two or more activities as part of the same development for which S&EIR must already be applied in respect of any of the activities. ➢ Activities under Listing Notice 1 that are relevant to this project.		
GNR No. 327 (7 April 2017) **Listing Notice 1.**	Activities under Listing Notice 1and 3 that are relevant to this project are as follows;	
	Listed activity 12: The development of – (xii) infrastructure or structures with a physical footprint of 100 square	The proposed project has a infrastructures or structures of more than 100 square meter,

	metres or more; where such development occurs – (c) If no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; —	which is located at within 32m of a watercourse / wetland.
GNR No. 324 (7 April 2017**) Listing Notice 3**.	**Listed activity 12:** 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. v. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;	The project also requires the clearance of 1110 square meters of indigenous vegetation.
	Listed activity 14: The development of – (ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs - (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; (x) Outside Urban areas (aa) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any terrestrial protected area identified in terms of	The project entails the construction of a pump station and gravel road within 32 m of a national wetland. The area is located at approximately 3.7km away from the iSimangaliso wetland Park (a national protected area).

	NEMPAA or from the core area of a biosphere reserve;	
National Water Act (Act No. 36 of 1998)	➢ Chapter 3 – Protection of water resources. ➢ Section 19 – Prevention and remedying effects of pollution. ➢ Section 20 – Control of emergency incidents. ➢ Chapter 4 – Water use. ➢ Authority – Department of Water and Sanitation (DWS).	
National Environmental Management Air Quality Act (Act No. 39 of 2004)	➢ Air quality management ➢ Section 32 – Dust control. ➢ Section 34 – Noise control. ➢ Authority – EDTEA.	
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	➢ Management and conservation of the country's biodiversity. ➢ Protection of species and ecosystems. ➢ Authority – EDTEA.	
Occupational Health & Safety Act (Act No. 85 of 1993)	➢ Provisions for Occupational Health & Safety ➢ Authority – Department of Labour.	
National Heritage Resources Act (Act No. 25 of 1999)	➢ Section 34 – protection of structure older than 60 years. ➢ Section 35 – protection of heritage resources. ➢ Section 36 – protection of graves and burial grounds. ➢ Authority – KwaZulu-Natal Amafa and Research Institute	

National Road Traffic Act 1996 (Act No. 96 of 1996)	➢ Authority – KwaZulu-Natal Department of Public Works, Roads and Infrastructure.

10 DESCRIPTION OF THE PROJECT AREA

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

10.1 Climate

The Southern African region is divided into three climatic regions; Wet, dry and moderate, and in terms of Köppen-Geiger climate classification the region of the KwaZulu Natal encompasses both, such as humid subtropical (Cfa), oceanic climate (Cfb), hot semi-arid climates (BSh) and tropical savanna climate (Aw), but the most prevalent ones are Cfa and Cfb (Climate-Data.org).

The study region of uMkhanyakude District at Mtubatuba lies on 66m above mean sea-level, its climate falls under the tropical savanna climate (*Aw*) by Köppen and Geiger, and is classified as temperate climate with warm to hot summers and mild winters, with the mean annual temperature of 21.8 °C. The lowest mean temperature of 21.8 °C experienced between March and July and highest summer mean temperature varies between 29 ºC and 32 ºC. The Mtubatuba region also, has annual precipitation of 900 mm which is mostly experienced during summer season between October and April. The driest month is June with precipitation of 38 mm, and most precipitation of more than 111 mm falls within March (Ezemvelo KZN Wildlife, 2014; Climate-Data.Org).

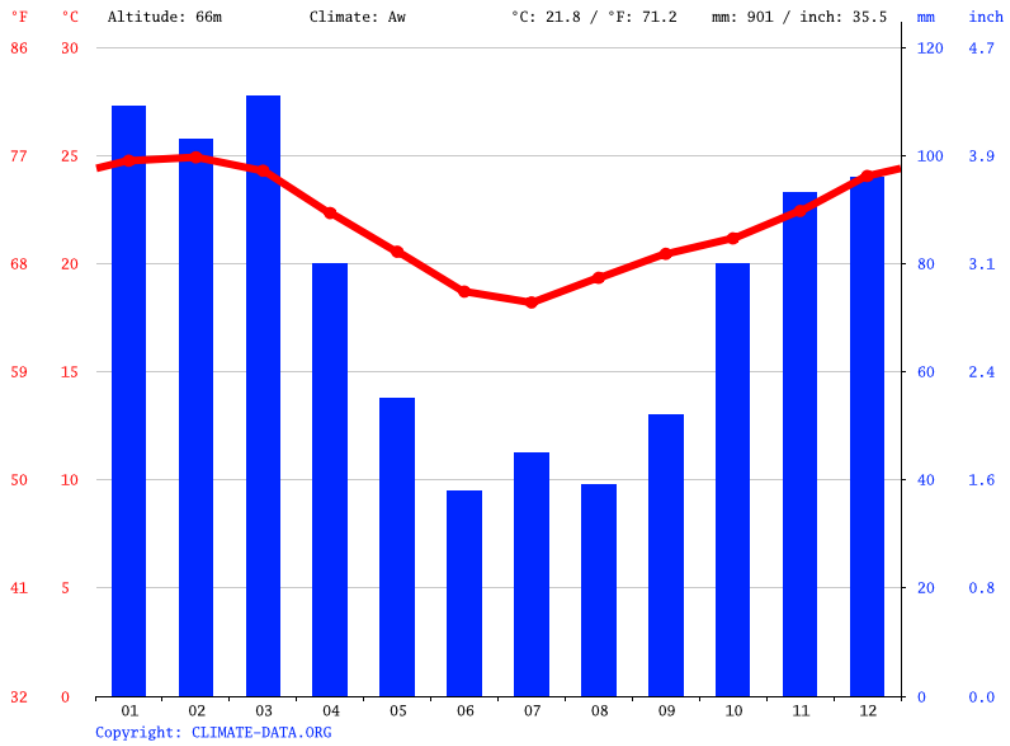

Figure 3: Mtubatuba climate graph [Source: Climate-Data.Org]

10.1.1 Potential impact

There are no direct adverse impacts foreseen in terms of the project to the climate. However, due to deep excavation and dewatering for the construction of pump station wet well, the wet climatic conditions could have a significance impact as a result of water inundation within EGL deep excavation. The measures to reduce the ground water impact and project's carbon footprint will be considered further in the EMPr.

10.2 Hydrology

The hydrological system of uMkhanyakude District conglomerate with high and low-lying areas. The high-lying areas with dominantly of non-perianal hydrological system at the western part of the district that rather drain eastwards to low lying plains forming wetland systems. Also, the western areas further south is characterised of both of low-lying and high-lying areas whereby those low-lying areas are rich in flood-plain wetlands (Ezemvelo KZN Wildlife, 2014). Moreover, the proposed Nordale Sewer Pump station and Gravel Access Road is within Mtubatuba which is the southern region of uMkhanyakude District and is characterised of low-lying area.

The hydrological features within the region of the study area are discussed below.

10.2.1 Rivers and dams

The uMkhanyakude District is bordered by Mfolozi River at the southern region, and has Pongola River, which drains the north-western area northwards toward the Great Usutu River and Mozambique, the Msunduzi River and Mkuze River traversing central region in a southerly direction toward the iSimangaliso Wetland Park system, whilst the Hluhluwe, Nyalazi River and Mfolozi Rivers drain the southern areas towards the iSimangaliso Wetland Park system (Ezemvelo KZN Wildlife, 2014).

There are no dams, streams or rivers within the project locality. However, the project region has the Mfolozi River approximately (4.6km south) and Msunduzi River approximately (8.3km) traversing parallel towards east and eventually terminating at the wetland plain within St Lucia and later integrated to Greater St Lucia Lake which drains into Indian Ocean, near St Lucia. These rivers are classified as National Freshwater Ecosystem Priority Area (NFEPA) Rivers (***Figure 4***).

10.2.2 Wetlands

The uMkhanyakude District is rich in wetland systems which are mainly formed at the large areas of low-lying plains draining from the west of the district, to Greater iSimangaliso Wetland Park. Also, the project region Mtubatuba is also rich in floodplain wetland areas is drained by the Mfolozi, Msunduzi and Nyalazi Rivers. (Ezemvelo KZN Wildlife, 2014).

There are also number of isolated wetlands landscape and plains dispersed across the project region recognised as National Freshwater Ecosystem Priority Areas (NFEPA) as Wetland FEPA's, and national wetlands. However, most of the wetlands and plans had been transformed for cultivation (***Figure 4***).

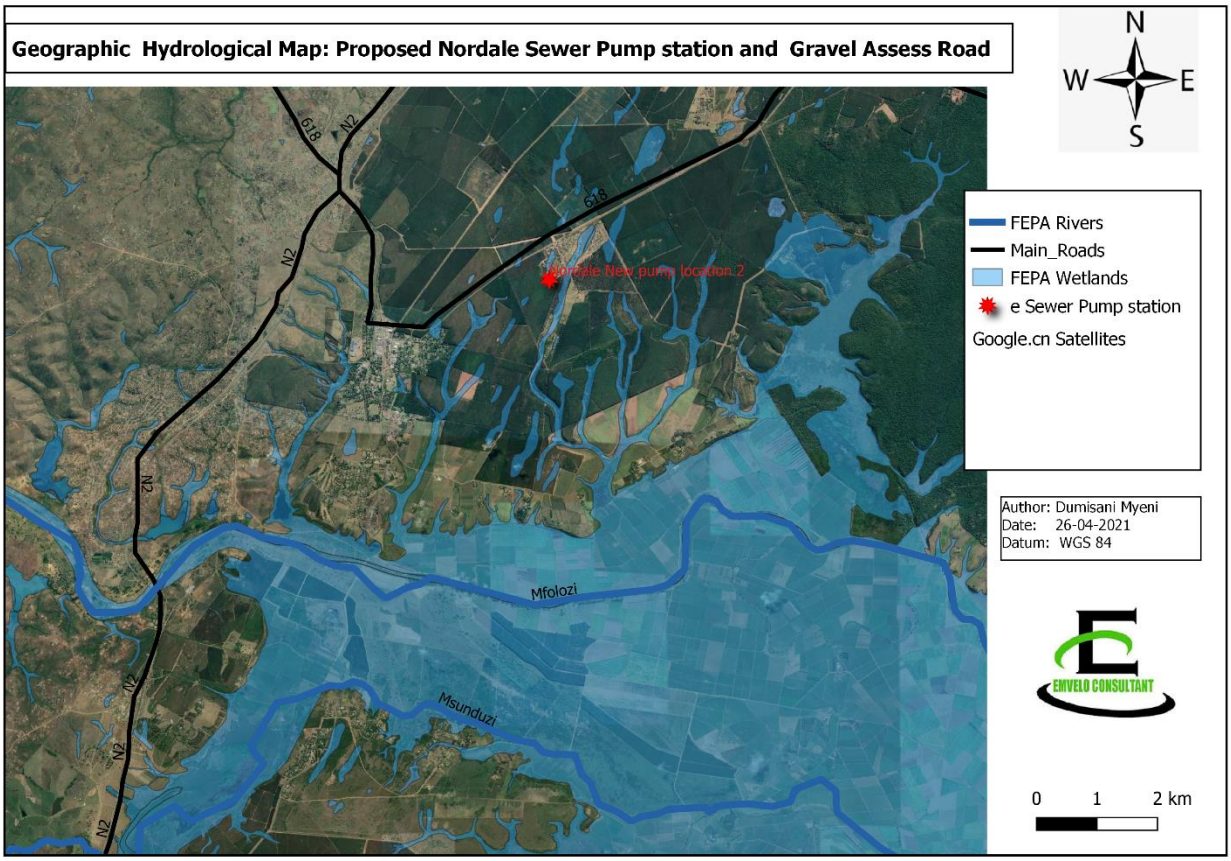

Figure 4: Geographic hydrological map for Nordale Sewer Pump station and access road

There is an intrusion between 32m wetland buffer at other portion of the access road. Also, intrusion of FEPA wetlands exists within the 500m buffer coverage of project area due the existence of Indian Ocean Coastal Belt Group 1 (NFEPA WetVeg) within the project region. The FEPA wetland coverages in relation to 500m buffer and 32m wetland buffer of the study area is shown in (***Figure 5***) below.

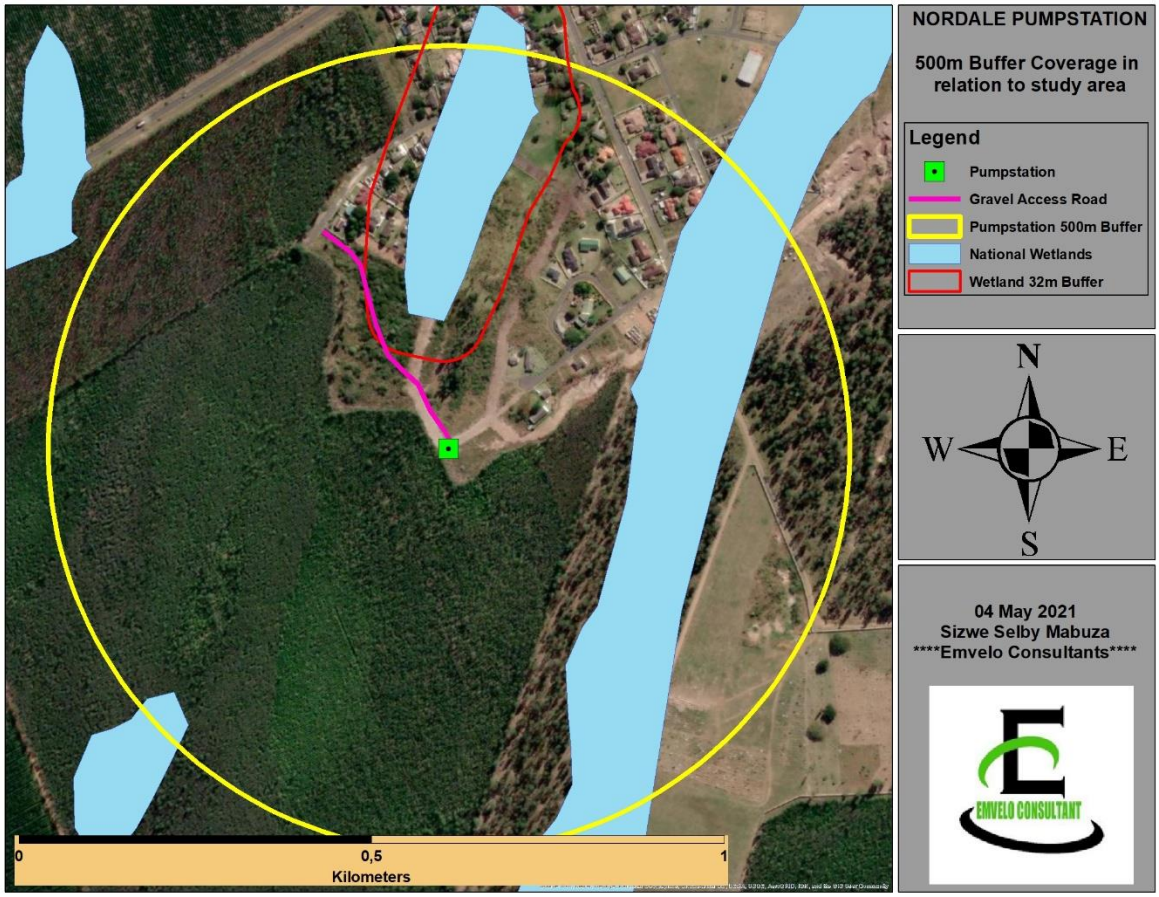

Figure 5: Map showing wetlands coverage in relation to 32m buffer within study area

10.2.3 Potential impacts of the project hydrological features

Other portion of the proposed access road falls within 32m wetland coverage. Also, the 500m coverage enlist the FEPA wetlands. Wetland are sensitive environmental system, any work within the wetland are considered highly sensitive. Moreover, considering the 5m deep excavation for the pump station wet well which could reach the EGL, there might be possibility of dewatering. Any work within the wetland system is considered highly sensitive. However, considering the anticipated project footprint the project would pose low risks to the wetland system, provided that the recommendations by the Wetland Specialist and the EMPr are adhered to minimise any impacts that may arise during construction and operation.

10.3 Topography

The King uMkhanyakude District has a varied topography that extends from the flat eastern coastal plans with undulating coastal dunes, and flat terrain from west, east and southern

foothills of Lebombo Mountain range with peak altitude of 670m above mean sea-level. Moreover, the Mtubatuba which is the project region lies between 10-70m above mean sea-level (Ezemvelo KZN Wildlife, 2014).

Furthermore, the study area is characterised of relatively flat terrain with wetlands and plains dispersed across the project region, with altitudes ranging between 60m and 80m above mean sea-level (***Figure 6***).

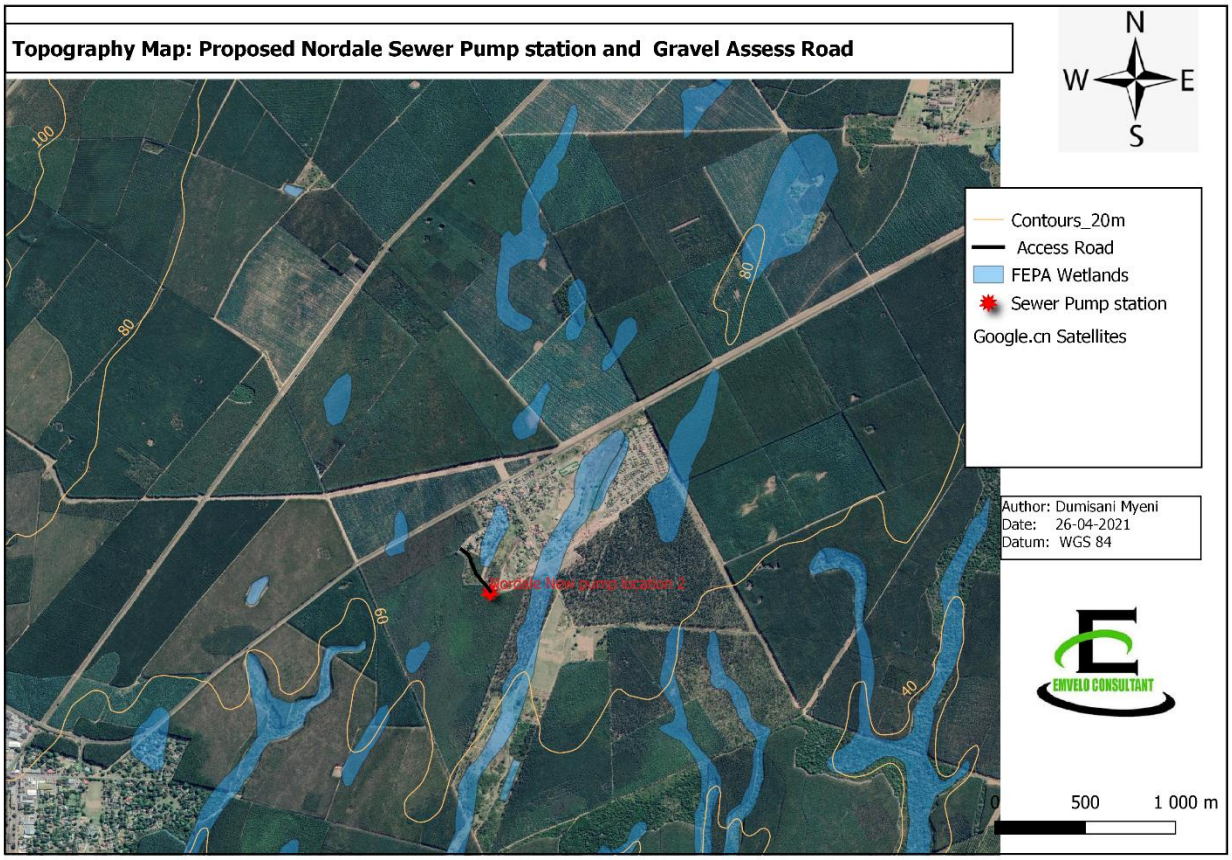

Figure 6: Contour Map showing elevations within the project area

10.3.1 Potential impacts

The sewer system operates based on gradient slope; hence the pump station is placed on the lowest gradient to allow efficient to maximise pumping capacity. Therefore, due to the nature of the terrain in Nordale (very flat terrain), very deep sewers (depth >5m) of inlet pipeline could occur in pump station sewer connection such as scour valves at pump station (***Refer to***

Section 10.4.1). However, proper mitigation can be achieved by the implementation of the proposed design, also through carefully implementation of recommendations given by Hydrological Specialist and the EMPr.

10.4 Geology and soils

The uMkhanyakude District's geological features are stratified and with intrusion across the region, which vary widely according to their topographical location. However, sandy soils which are susceptible to run-off erosion tend to dominate in the eastern and coastal region. The district is characterised by soils of well to moderate drainage, black soils, duplex soils and alluvial soils. The coastal (eastern region) is characterised of flat plains with coastal sand dunes. This part of the District is underlain by *Cainozoic* sediments of *Maputaland Group formation* and *Zululand Group* f*ormation*, which are later transitionally transversed by *Ecca Group Arenite* of dolerite formation, further in land at the eastern foothill of Lebombo Mountain range. Furthermore, the Lebombo Mountain range is predominantly underlain *by Lebombo Group Basalt*, with western foothills at the southern region underlain by a conglomerate intrusion of shale, *Ecca Group Arenite* formation and *Vryheid Formation* and *Dwyka Group* formation of shale, sand stone, coal and alluvial formation (Ezemvelo KZN Wildlife, 2014).

The study area lies on the southern coastal region of uMkhanyakude District, with relatively flat topography comprise of sandy soils of Fw10/Fw11 *Fernwood soil series* and has soil texture of Sandy (Sa) to Sandy Clay Loam (SaClLm) dominance by sediments of *Zululand Group formation*, with siltstone, sandstone intrusion (***Figure 7***).

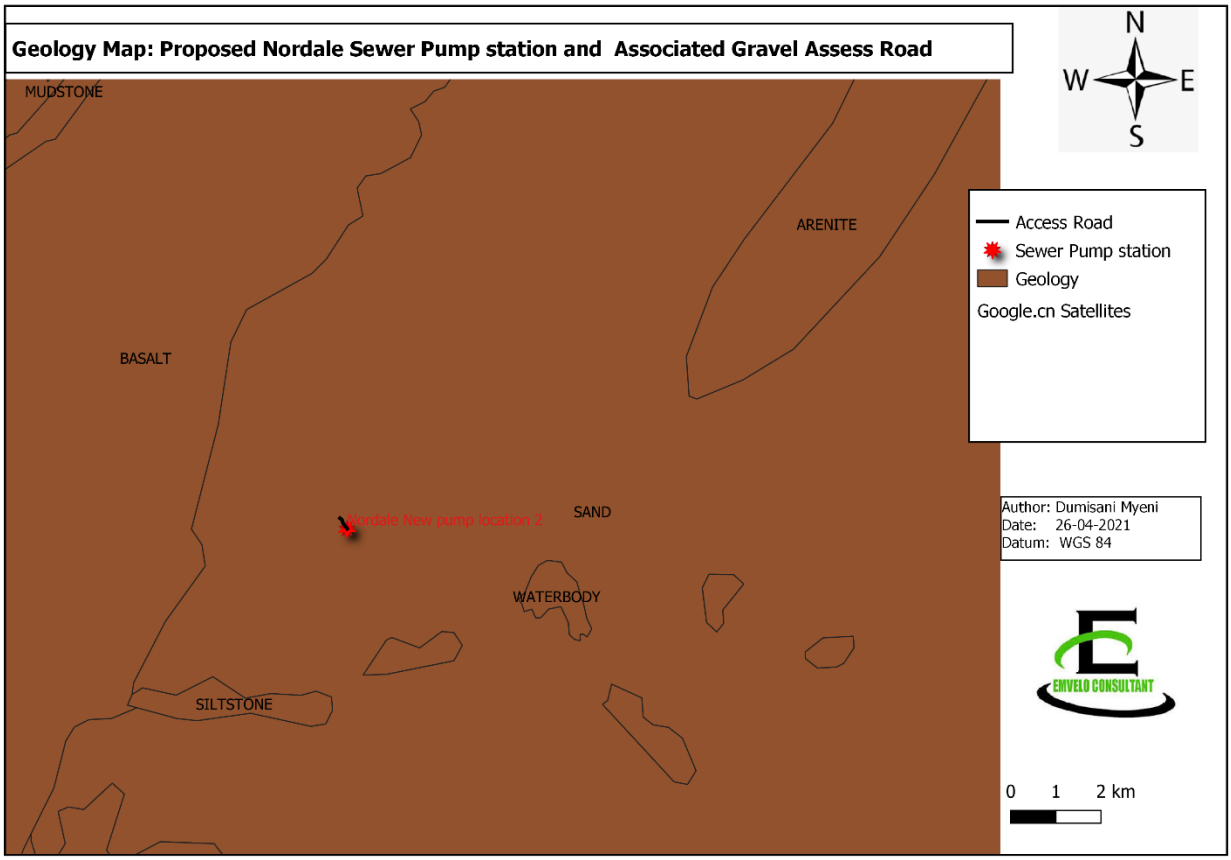

Figure 7: Map showing a dominance geological formation within the study area

10.4.1 **Potential impacts**

The scope of pump station construction involves 5m deep excavation for a wet well and for inlet scour valves installation; clearance and excavation for access road. It is therefore, important to note that these activities will be carried on *Zululand Group* formation characterised of geological formation of sandy soils of *Fw10/Fw11 Fernwood soil series*, with a relatively low erosion resistance. These activities may have impact on geological stability and topography as will exacerbate potential erosion problems and surface run-off. Therefore, the mitigation measures given by the Wetland Delineation Assessment and EMPr must be adhered to in order to minimise any potential significant impacts that may arise.

10.5 Biomes

The uMkhanyakude District traverses eight (6) biomes, namely; Azonal Forest, Forest, Indian Coastal Belt, Savanna, Grassland and Wetlands biomes and contains 45 vegetation types (Ezemvelo KZN Wildlife, 2014).

Moreover, the locality of the study area falls under the Savanna Biome, with dominantly Maputaland Coastal Belt (***Figure 8***).

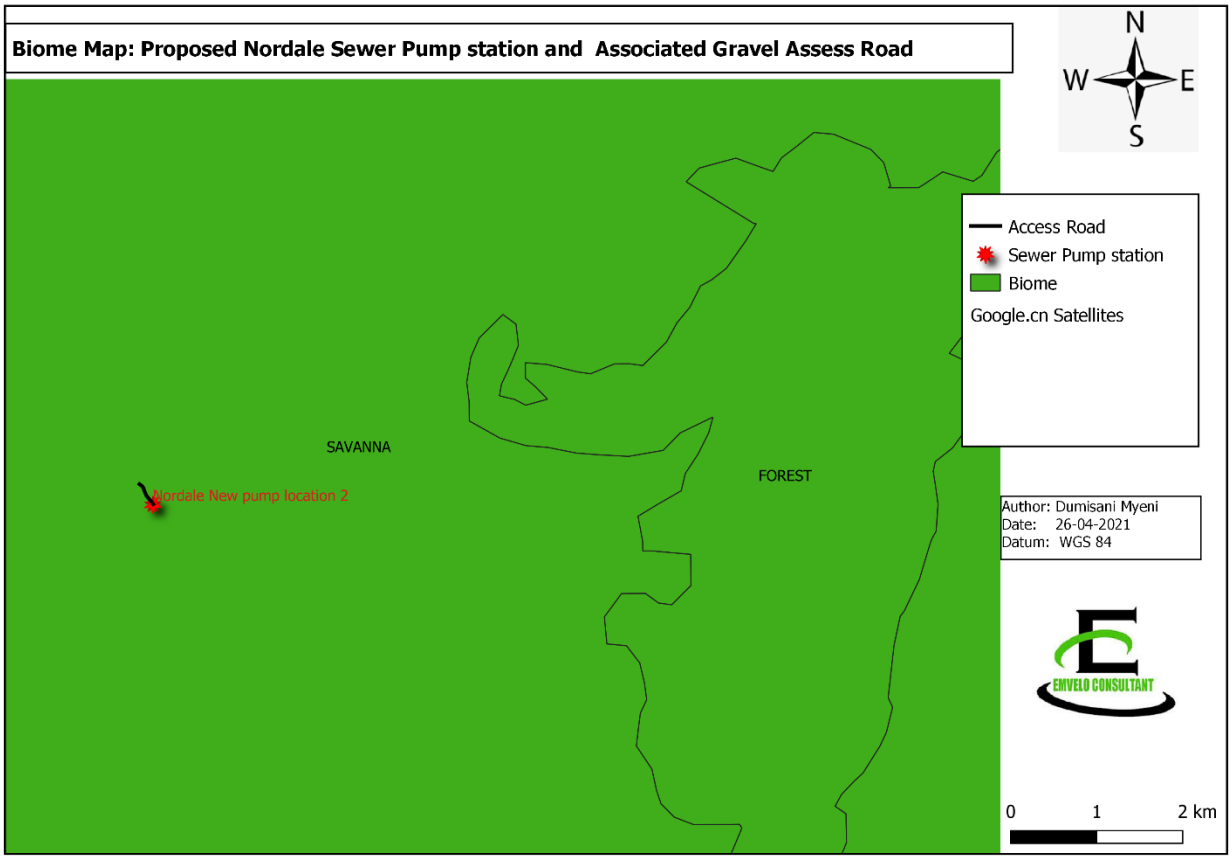

Figure 8: Map Showing the biome within the study area

10.6 Flora

The uMkhanyakude District has a very rich vegetation endemic from stratified biomes. Most noticeable the Maputaland region boasting with great conservation and biodiversity importance, hosting lush riverine and estuarine habitats, diverse savannah and foothill grasslands, and highly specialized and threatened dune forests (***Section 10.5***), stretching

from Mtubatuba towards South African and Mozambican boarder, with over 2500 species that occur within the Maputaland Centre of which at least 230 species are endemic or near endemic to the region (Ezemvelo KZN Wildlife, 2014).

Undisputable, the uMkhanyakude District is rich in vegetation species diversity endemic to Eastern Coastal region amongst other hosted by Arizona Forest, namely: Lowveld Riverine Forests, Mangrove Forests, *Ficus trichopoda* Swamp Forest, and *Raphia* Swamp Forest with a conservation status classified as "***Critically Endangered***". Other "***Critically Endangered***" forests are the; Dukuduku Moist Coastal Lowlands Forest and East Coast Dune Forest. Whilst the Maputaland Dry Coastal Lowlands Forest; Maputaland Mesic Coastal Lowlands Forest; Maputaland Moist Coastal Lowlands Forest; Maputaland Dune Forest with a conservation status classified as "***Endangered***". Moreover, the region also diversified by the Savanna vegetation, namely: Zululand Coastal Thornveld classified as "***Critically Endangered***"; Maputaland Coast Belt classified as "***Endangered***"; The Western Maputaland Clay Bushveld and Zululand Lowveld classified as "***Vulnerable***". The district also hosts diversified wetlands vegetation species of conservational concern such as: Lowveld Floodplain Grasslands and *Lacustrine* classified as "***Critically Endangered***". The Subtropical Alluvial Vegetation; Lowveld Floodplain Grasslands are classified as "Endangered". Whilst the Tall Reed Wetland and Subtropical Freshwater Wetlands are classified as "***Vulnerable***". Furthermore, the grassland vegetation comprises the Lebombo Summit Sourveld and Maputaland Wooded Grassland which are classified as "***Endangered***" (Ezemvelo KZN Wildlife, 2014).

As mentioned above the vegetation within locality of the study is dominantly the Maputaland Coastal Belt (CB 1) (***Figure 9***) with a conservation status classified as "***Vulnerable"*** and with a 25% conservation target (Mucina and Rutherford 2006).

The field investigation within the study locality observed that the project site has been largely modified with its current condition consisting predominantly invasive thicket and weed such as: Eucalyptus plantations; *Vachellia farnesiana sp*. (Sweet acacia); *Melia azedarch sp*. (Syringa); and *Richardia brasiliensis sp*. (Tropical Mexican clover). The indigenous shrub and grass species were also identified. This include the grass species such as: *Melinis repens sp.* (Natal red top*)*, *Digitaria eriantha sp.* (Common finger), *Panicum maximum sp.* (Guinea grass*)*, *Sporobolus Africanus sp*. (Rat's tail), and Sporobolus pyramidalis sp. (Cat's tail). The shrub

species include: *Strychros madagascariensis sp*. (Black monkey orange) and *Helichrysum aureum sp*.

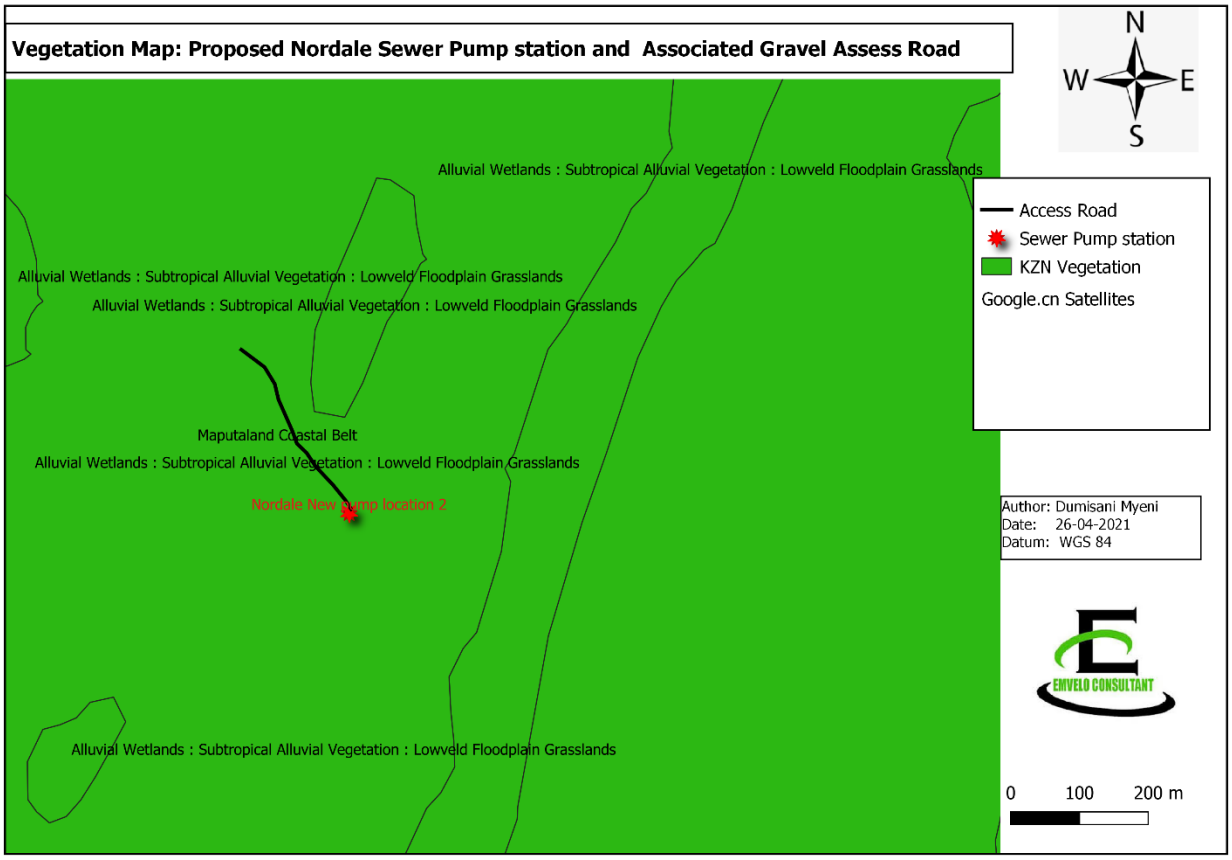

Figure 9: Map showing the vegetation types within the study area

10.6.1 Potential Impacts

Potential impacts to vegetation could result from the construction of the proposed development which involves the clearance of vegetation in accordance to clearance along the access road, pump station site and construction site camp. Therefore, the mitigation measures given by the Terrestrial Ecological Assessment and EMPr must be adhered to in order to minimise any potential significant impacts that may arise.

10.7 Protected areas and biodiversity mapping

The KwaZulu-Natal Biodiversity Plan outline two main categories of areas that are required to meet conservation targets for the province. These two main categories include Critical

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

The uMkhanyakude District falls within a bioregion and hosts a number of formally protected and other conservation areas, namely: iSimangaliso Wetland Park; Makasa Nature Reserve; Manguzi Forest Reserve; Tembe Elephant Park; Sileza Nature Reserve; Ubombo Mountain Nature Reserve; Ndumo Game Reserve; Hluhluwe-iMfolozi Park; Hlatikulu Forest Reserve; Futululu Forest; Futululu Conservation Area; and a number of private game reserves (Ezemvelo KZN Wildlife, 2014). The study region at Mtubatuba Local Municipality lies the iSimangaliso Wetland Park which is listed as a terrestrial protected area identified in terms of NEMPAA. The iSimangaliso Wetland Park buffer is located at approximately 4km east of the project site (***Figure 10***).

Upon interrogation of the KZN Biodiversity Conservation Plan (KZNBCP) for terrestrial areas KZN Biodiversity Plan, it was determined that no CBAs or ESAs are located within close proximity to the proposed project site (***Figure 10***).

Table 5: Subcategories of CBA and ESAs [Source: Ezemvelo KZN Wildlife,2016]

Critical Biodiversity Areas (CBAs) **– Crucial for supporting biodiversity features and ecosystem functioning and are required to meet biodiversity and/or process targets**	
Critical Biodiversity Areas: Irreplaceable	Areas considered critical for meeting biodiversity targets and thresholds, and which are required to ensure the persistence of viable populations of species and the functionality of ecosystems.
Critical Biodiversity Areas: Optimal	Areas that represent an optimised solution to meet the required biodiversity conservation targets while avoiding high cost areas as much as possible (Category driven primarily by process, but is informed by expert input).

Ecological Support Areas (ESAs) – **Functional but not necessarily entirely natural areas that are required to ensure the persistence and maintenance of biodiversity patterns and ecological processes within Critical Biodiversity Areas.**	
Ecological Support Areas	Functional but not necessarily entirely natural terrestrial or aquatic areas that are required to ensure the persistence and maintenance of biodiversity patterns and ecological processes within the Critical Biodiversity Areas. The area also contributes significantly to the maintenance of Ecosystem Services.
Ecological Support Areas: Species Specific	Terrestrial modified areas that provide a critical support function to a threatened or protected species, for example agricultural land or dams associated with nesting/roosting sites.
Ecological Support Areas: Buffers	Terrestrial areas identified as requiring land-use management guidance not necessarily due to biodiversity prioritisation, but in order to address other legislation/ agreements which the biodiversity sector is mandated to address, e.g. WHS Convention, Triggers Listing Notice criteria, etc.

Although, the study area mainly falls under a natural and/or near natural environmental area not identified as a critical biodiversity area and largely transformed through housing development, it is important to note the proximity of iSimangaliso Wetland Park which its buffer runs approximately 4km south of the project site. However, there were no species of conservation concern (SCC) that were found on the site during the field survey.

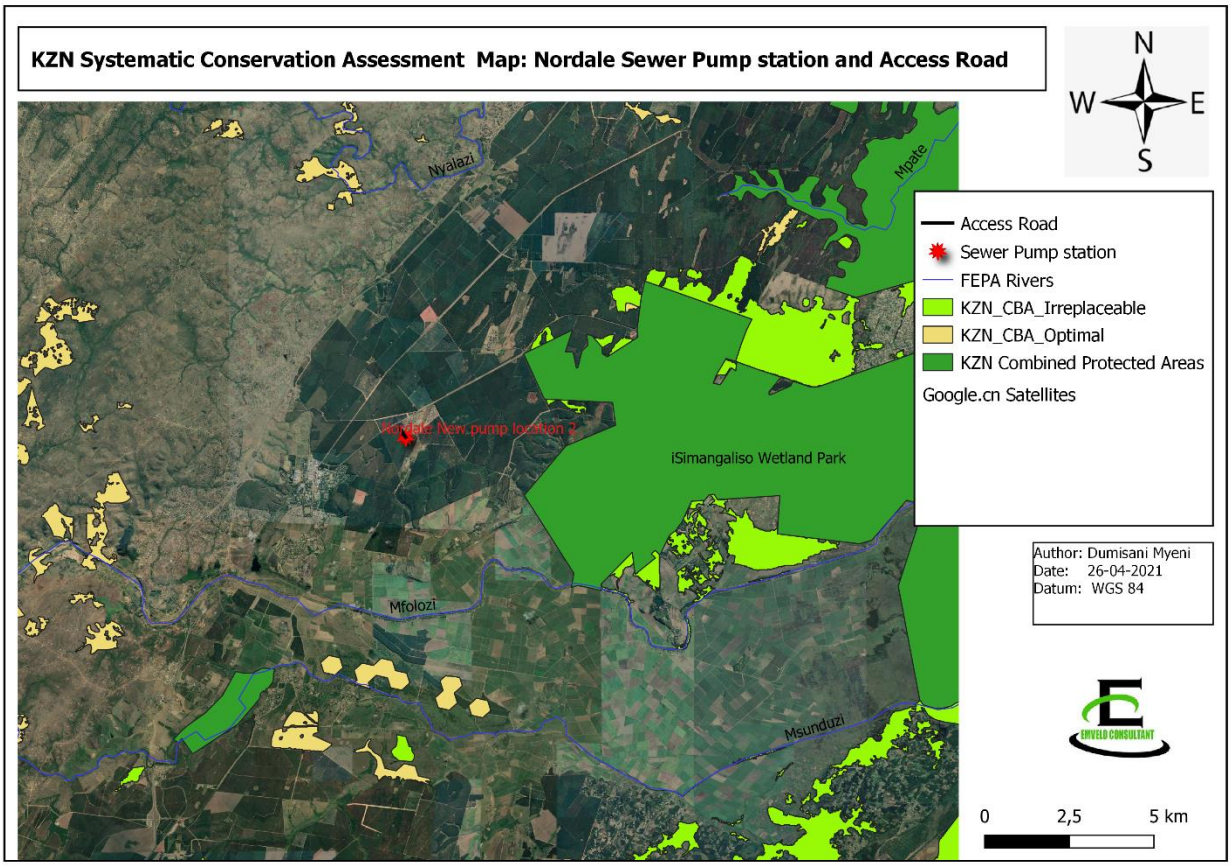

Figure 10: Map showing KZN Biodiversity Spatial Planning within the study area

10.7.1 Potential Impacts

Intensive vegetation clearance at project site can lead to fragmentation, reduction, and loss of habitat as well as the migration of animals away from the area, in particular the bird species that forage around the project area. However, the clearance will be within project footprint. Therefore, the mitigation measures given by the Terrestrial Ecological Assessment and EMPr must be adhered to in order to minimise any potential significant impacts that may arise.

10.8 Fauna

The uMkhanyakude District lies within the Maputaland-Pondoland Albany hotspot which said to have high levels of species and endemism for fauna in avifauna, reptiles, mammals and marine biodiversity. Whereby, 14 of the 631 bird species that inhabit this region is endemic and 25 globally threatened. Out of 208 species of mammal eight (8) of them are endemic to this region. The "***Critical Endangered***" faunal species within the district is the *Cloeotis*

percivali australis sp. (Short-eared trident bat), while other 12 are "***Endangered***", and 40 are "***Vulnerable***", with total of 20 species endemism (Ezemvelo KZN Wildlife, 2014).

In addition, when the study region is interrogated against Quarter Degree Square (2832AC) obtained from Fitzpatrick Institute of African Ornithology Virtual Museum (2019), the region also confirms the availability of avifauna such as: *Circaetus fasciolatus sp*. (Snake-Eagle) classified as "***Critical Endangered***"; the *Ephippiorhynchus senegalensis* (Saddle-billed Stork) classified as "Endangered"; and the *Microparra capensis* (Lesser Jacana) classified as "***Vulnerable***". The availability of reptiles such as: *Hemisus guttatus* (Spotted Shovel-nosed Frog) classified as "***Vulnerable***". The availability of mammal species such as: *Hippotragus equinus* (Roan Antelope) classified as "***Endangered***" in terms of IUCN Red List, (IUCN, 2021).

10.8.1 Potential Impacts

Vegetation clearance within the wetland area for the purpose of setting up construction camp and development of Sewer Pump station with associated access road could modify the natural integrity of wetland and the nearby habitat, hence locality fauna disturbance might occur and could led to habitat fragmentation, reduction, and loss of habitat as well as the migration of animals away from the area, in particular, the above listed bird species who might forage around the project area, and listed frog species. Another threat to the fauna around the site can be the poaching and wilful harming of animals by the construction workers. Although, there were no fauna species encountered during the Environmental Study, the site is suitable for development, provided that the recommendations given by the Ecological Assessment and EMPr are adhered to.

10.9 Visual environment and land use character

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

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

Therefore, the viewshed area and zone of visual influence for the proposed Nordale Sewer Pump station, access road to sewer pump station, and related associated sewer infrastructure is considered "***low visibility***" as it can be visible from a small area around the project site (<1km radius). The project area is in an urban area with associated infrastructure, making this proposed development to be streamlined with the local environment.

10.9.1 Potential Impacts

The proposed sewer infrastructure project consists of mainly upright structures such as sewer pump station structure, and low-lying infrastructure such as sewer lines and access road being developed within the urban area. The proposed infrastructure will blend in with existing land uses and other elevated structures in the area, due to the screening effect of foreground elements such as the established settlements. This project is not anticipated to be highly visible from great distances and will be perceived by receptors in close proximity in the category of "***low visibility***". Although, dust and other construction activities might contribute to negative visual impact, but these impacts can be mitigated, provided that dust and other visibility aspects are managed through proper implementation of recommendation provided by EMPr.

10.10 Heritage and cultural aspects

According to Ezemvelo KZN Wildlife (2011), the history of human inhabitation in the region around Mtubatuba and Hlabisa dated back since the early stone age to the late iron age, which involves San tribe and later Nguni tribe from the middle ages. Whereby, this history could be exhibited through kraals, burial and smelting sites.

The site investigation did not record any graves or cultural aspects visible material remains pertaining to heritage resources within the proposed development footprint. However, the inquiry has been lodged with AMAFA to ascertain whether there are any cultural and heritage sites within the study area. Findings will be incorporated into the final Basic Assessment Report.

10.10.1 Potential Impacts

The excavation for sewer pump station and associated access road construction activities can cause negative impacts on cultural resources that might be buried underground. During the excavation activities, the heritage elements that might be buried on the underground may be affected. Therefore, precautionary measures must be practiced during construction activities to mitigate the impacts, through proper implementation and adhering to the recommendation provided by the EMPr.

10.11 Social and economic aspects

Mtubatuba Local Municipality has a highest population density (102 people per km^2) than other municipalities within uMkhanyakude District, with the projected population of 212,837 by 2021. Moreover, this Municipality is not immune to country's triple challenge of unemployment, poverty and inequality as employment rate (31%) in formal sector has been hampered by slow economic growth rate, while Covid-19 pandemic is exacerbating to already ailing local economy (Mtubatuba IDP, 2020-2021).

10.11.1 Potential Impacts

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

11 WASTE, EFFLUENT, AIR POLLUTION AND ATMOSPHERIC EMISSIONS

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

11.1 General waste management: construction phase

Some of the possible solid and liquid waste during the construction and assembling of the pipelines and associated infrastructure include general waste (plastic, paper, food scraps, etc.), hazardous waste (chemicals, oil, diesel, resins, drilling fluids, sewage, etc.), medical waste from onsite injuries (bandages, swabs, medication, needles, etc.) and building rubble (cement, steel, wood, etc.)

11.2 Effluent

No effluent will be generated during the construction phase of the project. However, minor spillages like oil and diesel might be expected during operational phase. Therefore, proper measures will be put in place to contain any spillages (oil spills) occurring during construction, as prescribed by EMPr. The effluent spills management will be addressed during operational phase and adherence to a Maintenance Management Plan.

11.3 Ambient air pollution and atmospheric emissions

The proposed development itself will not have direct impact on air pollution and atmospheric emission. However, certain activities during construction could have a minor impact on the ambient air as a result of emissions from the onsite equipment, machinery and vehicles. These include dust emanating from construction activities and fumes (carbon monoxide) released by construction vehicles and machinery. These minor impacts can be mitigated through adherence to the EMPr.

The activity will, therefore, have an indirect but minor effect on the release of emissions. The release of significant emissions from any source will be controlled under the National Environment Management: Air Quality Act 39 of 2004.

11.4 Noise management

The project sites will emit different levels of noise due to the various construction activities, movement of heavy construction vehicles, use of machinery as well as from large number of workers on site. However, noise impacts are expected to be of short duration and only during certain times of the construction phase, which is likely to only have impacts to the immediate

environment. The potential noise pollution impacts will be mitigated provided that the EMPr is adhered to.

12 WATER USE

The water to be used during construction will be supplied by the uMkhanyakude District Municipality, with the provision of existing water supply within the project locality. This includes the metered water from the existing water supply. The water use will include water construction and consumption for drinking, cleaning and hygiene as well as dust suppression where required.

13 THE PUBLIC PARTICIPATION PROCESS

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

13.1 Background

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

The PPP also provides all the stakeholders including the community with a platform to raise their environmental concerns before the Competent Authority can make a final decision regarding the issuing of the Environmental Authorization. This prevents and minimizes disputes before they become unsolvable. Chapter 6 of the EIA regulations emphasize that the

information related to the proposed project must be made available to I&APs, prior to a final decision. Therefore, this process will allow I&APs to have access to the information relating to this project. The application was conducted according to Chapter 6 of the EIA Regulations 2017.

13.2 Objectives of public participation

The objectives are as follows:

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

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

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

Table 6: Public Participation Processes

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

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

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

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

The I&APs were provided with the opportunity to raise their concerns and comments regarding the proposed development project. Firstly, a Background Information Document (BID) was sent to all relevant I&APs. The onsite notices in isiZulu and English were posted onsite on 19th February 2021. Notices were displayed in strategic positions in the project area in order to enhance accessibility from the public. Following, the posting of onsite notices, the newspaper advert in isiZulu and English was published by Eyethu Bay Watch News Paper (*27 April 2021 edition*). The public participation meeting (community meeting) was conducted within the ambit of Covid-19 regulations where ward committee were engaged. Currently the Public Participation process is at the stage of the circulation of the Draft Basic Assessment Report, of which all I&APs had 30 days to comment or provide their inputs.

All comments and concerns raised are to be recorded on the I&APs Commenting Report, and to be attached in Appendix E.

14 IMPACT ASSESSMENT AND MITIGATION MEASURES

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

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

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

Occurrence

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

Severity

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

The following ranking scales were used:

Probability = P	*Duration = D*
5 – Definite (More than 80 % chance of occurrence)	5 – Permanent - The only class of impact that will be non-transitory (indefinite)
4 – Probable (Between 60-80% chance of occurrence)	4 - Long-term - The impact and its effects will continue or last for the entire operational life of the development (15 - 50years)
3 – Possible (Between 40-60% chance of occurrence)	3 - Medium-term - The impact and its effects will continue or last for some time after the construction phase (5 - 15 years)
2 – Fairly Unlikely (Between 20-40% chance of occurrence	2 – Medium-short - The impact and its effects will continue or last for the period of a relatively long
1 – Unlikely (Less than 20% chance of occurrence)	

	construction period and/or limited recovery time after this construction period (2 - 5 years) 1 – Short Term - Likely to disappear with mitigation measures or through natural processes which span shorter than the construction phase (0-2 years)
Scale = S 5 – International (beyond 200km) 4 – Regional (50-200km radius) 3 – Local (2-50km radius) 2 – Surrounding area (within 2km) 1 – Site (within100m)	*Magnitude = M* 5 - High 4– Medium High 3 – Medium 2 – Medium Low 1 – Low
Status of Impact *+ Positive / -Negative or 0-Neutral*	

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

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

SP = (Magnitude +Duration +Scale) x Probability

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

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

14.1 Impact Analysis (Preferred Design Alternative)

Potential impact	Impact Significance without Mitigation	Proposed Mitigation Measures	Impact Significance with mitigation
Project Planning			
Unnecessary damage and disturbance to natural vegetation due to poor planning: Erosion due to poor planning and design such as, clearing of vegetation, topsoil removal, degradation of indigenous vegetation and sensitive plant communities and associated habitats due to excavation for construction of pump station, and associated infrastructure (i.e. inappropriate utilization of sensitive systems).	**High** **(60)** **SP= (M + D + S) × P** **SP= (5 + 5 + 2 × 5** **SP =60**	➢ The vegetation clearance must be minimal, and only clearing areas along the as demarcated and approved by project plans. ➢ An ECO must be appointed to oversee construction activities. ➢ A plan to actively rehabilitate the construction area post-construction needs to be developed.	**Negligible** **(10)** **SP= (M + D + S) × P** **SP= (2 + 2 + 1) × 2** **SP =10**
Loss of plant Species of Conservation Concern (SCC) as a result of poor planning: Poor planning and construction may result in the permanent loss of various plant species of conservation concern (SCC). No CBAs within project proximity. However, the plant SCC predicted to occur on *Maputaland Coastal belt* (Cb1) were not encountered during the field study at the project site.	**High** **(55)** **SP= (M + D + S) × P** **SP= (5 + 3 + 3) × 5** **SP =55**	➢ Minimize vegetation clearance by only clearing areas as demarcated and approved by project plans. ➢ Site camp must be established at already disturbed site. ➢ An ECO must be appointed to oversee construction activities.	**Negligible** **(10)** **SP= (M + D + S) × P** **SP= (1 + 1 + 3) × 2** **SP =10**

Potential impact	Impact Significance without Mitigation	Proposed Mitigation Measures	Impact Significance with mitigation
Project Planning			
Degradation of freshwater/wetland habitat as a result of poor planning. Poor design and / or implementation of the planned infrastructure associated with the pump station likely to result in degradation of wetland habitat include (i) undertaking bulk earthworks within the wetlands; (ii) Dewatering for construction of wet well within EGL;(iii) Placing infrastructure within the wetlands, and (iv) Leveling, compaction works and impervious surfaces such as paving within the wetland. These activities will lead to removal degradation of wetland system, flow regime alteration as well as the alteration of the natural topography.	**Very High (65)** **SP= (M + D + S) × P** **SP= (5 + 4 + 4) × 5** **SP = 65**	➢ Although the proposed site is within the 500m coverage, the proximity of construction of pump station and associated infrastructure must **NOT** be within 32m of wetland buffer. If possible no construction should take part within 32m wetland buffer. ➢ The project site servitude must be clearly demarcated to avoid unnecessary disturbances to adjacent areas. ➢ Detailed method statement for working within the sensitive wetland system must be compiled by the contractor prior to the commencement of the project. ➢ Conceptual wetland rehabilitation and monitoring plan with a focus on erosion and alien vegetation management, be compiled. ➢ Dewatering for wet well construction must be approved by DWS. ➢ An ECO must be appointed to oversee construction activities.	**Low (21)** **SP= (M + D + S) × P** **SP= (3 + 2 + 2) × 3** **SP = 21**

Potential impact	Impact Significance without Mitigation	Proposed Mitigation Measures	Impact Significance with mitigation
Construction Phase			
Loss of indigenous vegetation during construction: The proposed development of pump station and associated infrastructure , will result in minimal obliteration of vegetation on site for the purpose of construction except where necessary within the project footprint. Also, through uncontrolled construction activities beyond the required footprint of the project area.	**Medium** **(40)** **SP= (M + D + S) × P** **SP= (5 + 3 + 2) × 4** **SP =40**	➢ Vegetation clearance must be minimal only to areas as demarcated and approved by project plans. ➢ Only the approved existing access road must be used, and vehicles must not traverse virgin land. ➢ The project boundary must be demarcated and vegetation clearing as well as topsoil removal must be limited to site only.	**Negligible** **(10)** **SP= (M + D + S) × P** **SP= (2 + 1 + 1) × 2** **SP =8**
Loss of plant species of conservational concern as a result of poor construction activities: No plant SCC were located onsite. The site has been largely modified with its current condition consisting predominantly by Eucalyptus plantations. Also, there are no CBAs: allocated within 500m coverage of the project site. However, it can't be ruled out that there might be plant SCC that were not encountered for during the field survey, and might be found during the construction phase.	**Very Low** **(20)** **SP= (M + D + S) × P** **SP= (5 + 3 + 2) × 2** **SP = 20**	➢ The project site must be surveyed prior to construction for identification of plant SCC. ➢ Establish buffer to section with plant SCC and declare it a no-go area. ➢ If possible, all plant species of conservation concern must not be removed, or disturbed. ➢ If needed, approval must be obtained from the ECO, before any disturbance or removal of plant species identified as of conservational concern.	**Negligible** **(4)** **SP= (M + D + S) × P** **SP= (2 + 1 + 1) × 1** **SP = 4**

Potential impact	Impact Significance without Mitigation	Proposed Mitigation Measures	Impact Significance with mitigation
Construction Phase			
Degradation of freshwater (Wetland) habitat as a result of poor construction activities. Construction activities within a sensitive wetland system will lead to removal degradation of wetland system, flow regime alteration as well as the alteration of the natural topography, as a result of construction activities such as excavation, bulk earthworks, levelling and compaction. Moreover, some portion of access road is within 32m wetland buffer. Therefore, such activity must be considered highly sensitive. Although, the pump station will be placed in a highly modified environment which look as if it was a wetland depression, the pump station is outside 32m wetland coverage, the 5m deep construction and dewatering within EGL for wet well construction might pose risk to adjacent wetland systems.	**Medium- High** **(44)** **SP= (M + D + S) × P** **SP= (5 + 4 + 2) × 4** **SP = 44**	➢ All clearance and excavation must be limited to areas as demarcated and approved by project plans. ➢ The project footprint must be clearly demarcated to avoid unnecessary disturbances to adjacent areas. ➢ Realign the portion of road that makes intrusion to 32m wetland buffer, to fall outside the 32m wetland coverage. ➢ Disturbed wetland habitat must be rehabilitated as soon as construction in an area is complete or near complete and not left until the end of the project to be rehabilitated. ➢ When required to do so, the approval for dewatering for a wet well construction must be obtained from DWS.	**Negligible** **(10)** **SP= (M + D + S) × P** **SP= (3 + 1 + 1) × 2** **SP = 10**
Disturbance of terrestrial species habitat as a result of construction activities The construction activities may result in the loss of habitat and permanent loss of unidentified animal SCC. Also, this might encourage migration of species. Furthermore, the animals with limited	**Medium** **(33)** **SP= (M + D + S) × P** **SP= (5 + 3 + 3) × 3** **SP =33**	➢ The project site must be surveyed for potential animal SCC prior to construction in order to any animal SCC. ➢ All construction activities must take place within an area demarcated for the development.	**Negligible** **(8)** **SP= (M + D + S) × P** **SP= (2 + 1 + 1) × 2**

Potential impact	Impact Significance without Mitigation	Proposed Mitigation Measures	Impact Significance with mitigation
Construction Phase			
mobility are often the first to be affected by habitat fragmentation due to the effects on population viability. Reptiles and small mammals may be separated into distinct populations. However, the construction will only be minimal to riverbanks within a project site.		➢ An ECO must be appointed to oversee construction activities.	**SP =8**
Disturbance to surrounding wildlife and fauna: During the construction, vehicle movements, noise and habitat destruction will disturb animals in the area. As a result, any construction activities likely result in the migration of fauna species which are endemic to the project area or a loss of animal species currently found on site.	**Medium (40)** **SP= (M + D + S) × P** **SP= (4 + 3 + 3) × 4** **SP = 40**	➢ Construction activities must be limited to the designated development footprint. ➢ During site preparation, special care must be taken during the clearing of the works area in order to minimize damage or disturbance of roosting and nesting sites. ➢ No faunal species are to be disturbed, trapped, hunted or killed during the construction phase. ➢ All construction and maintenance vehicles must stick to properly demarcated and prepared roads. Driving on virgin land is strictly prohibited. ➢ No fires should be allowed at the site. ➢ No dogs or other pets should be allowed at the site	**Very Low (14)** **SP= (M + D + S) × P** **SP= (2 + 3 + 2) × 2** **SP = 14**
Soil erosion due to loss of vegetation cover:	**High (60)**	➢ Vegetation clearance should be kept as minimal as possible to areas as demarcated	**Very Low (12)**

Potential impact	Impact Significance without Mitigation	Proposed Mitigation Measures	Impact Significance with mitigation
Construction Phase			
Erosion and degradation of habitats is likely to occur due to poor construction process during clearing of vegetation, topsoil removal and excavation works for the pump station and associated gravel access road. Also, the project area have a relatively low erosion resistance. Therefore, the disturbed soils are highly prone to erosion and surface run-off.	**SP= (M + D + S) × P** **SP= (5 + 5 + 2 × 5** **SP =60**	by the project plans and to make use of natural erosion suppressors such as good grassland cover. Do not wait for construction to finish in order to start rehabilitation. ➢ No work should be carried out within sensitive wetlands.	**SP= (M + D + S) × P** **SP= (2 + 1 + 1) × 3** **SP = 12**
Encroachment of Alien Invasive Species: The project site has been largely modified with its current condition consisting predominantly by *Eucalyptus* plantations. Also, has weed and alien thicket species. Therefore, the vegetation clearance especially within a wetland would likely cause percolation of alien and weed plant species.	**Medium** **(40)** **SP= (M + D + S) × P** **SP= (4 + 4 + 2) × 4** **SP = 40**	➢ Prevent large scale clearance, and only clear the areas as demarcated by approved project plans. ➢ The control and eradication of a listed invasive species must be carried out during and post construction within the project site. ➢ All sites disturbed by construction activities should be monitored for colonization by exotics or invasive plants and be regular removed.	**Negligible** **(8)** **SP= (M + D + S) × P** **SP= (2 + 1 + 1) × 2** **SP = 8**
Ground water contamination as a result of: There is a potential for leaks of hazardous substances from equipment on site. Such hazardous substances have the potential to enter the soil and wetland systems during construction and the operational phases of the project.	**High** **(52)** **SP= (M + D + S) × P** **SP= (5 + 4 + 4) × 4** **SP = 52**	➢ Suitable storage facilities for handling and storage of oils, paints, grease, fuels, chemicals, and any hazardous materials to be used, must be provided to prevent the migration of spillage into the ground and possible ingress into the groundwater regime.	**Negligible** **(8)** **SP= (M + D + S) × P** **SP= (4+ 2+ 2) × 1** **SP = 8**

Potential impact	Impact Significance without Mitigation	Proposed Mitigation Measures	Impact Significance with mitigation
Construction Phase			
		➢ Machinery must be parked on the designated bunded areas and dip trays must be placed under the machinery, when not used to capture any possible oil leaks. ➢ Portable clean-up kits must be available on site to undertake immediate clean-up, should a spill occur.	
Soil erosion and geological degradation within the project site: The *in-situ* material erodibility is considered to be high. Because the geological formation of sandy soils of Fw10/Fw11 Fernwood soil series has a relatively low erosion resistance. Therefore, excavation works at site should be considered highly sensitive activity as it is prone to erosion. However, as the terrain is relatively flat, this would limit to run-off and sedimentation of nearest wetlands.	**High** **(60)** **SP= (M + D + S) × P** **SP= (5 + 5 + 2) × 5** **SP = 55**	➢ Excavation works must be limited to development area as approved by project plans. Also be carried out in a manner to promote stable development of the site. It is recommended that excavation be carried out along the guidelines given in SANS 1200 (current version). ➢ Construct storm water system and make provision for erosion protection. ➢ Excavations must not be left open for a long duration and must not be undertaken until such time that all required materials are available on-site. ➢ Density control of placed fill material should be undertaken at regular intervals during fill construction.	**Very Low** **(5)** **SP= (M + D + S) × P** **SP= (3 + 1 + 1) × 1** **SP = 5**

Potential impact	Impact Significance without Mitigation	Proposed Mitigation Measures	Impact Significance with mitigation
Construction Phase			
		➢ Sediment barriers (gabions) must be installed in areas sensitive to erosion such as near water supply points, and actively eroding slopes.	
Disturbance of Burial Grounds and Graves: The excavation work would in some unfortunately situation likely to unearth unmarked graves. It must be noted that the project will take place within the urban area, whereby the residents used communal municipal burial site. Therefore, there are the are no chances that the grave be encountered within the project site. Moreover, there were no evidence of isolated graves within the project area.	**Very Low (12)** **SP= (M + D + S) × P** **SP= (5 + 5 + 2) × 1** **SP = 12**	➢ Excavation for pump station and associated infrastructure should be limited to development area as approved by project plans. ➢ Construction vehicles must only use the approved access roads. All construction machinery must be parked at designated areas. ➢ Monitoring must take place during site clearance for possible infant and still-born burials and implement the Chance Finds Procedure (CFP) if any such finds are uncovered. ➢ If any human remains, graves, archaeological and historical residues are discovered, the KwaZulu-Natal Amafa and Research Institute Act (5/2018) and the National Heritage Resources Act, No 25 of 1999. requires that operations should cease immediately pending an evaluation by the heritage authorities.	**Negligible (5)** **SP= (M + D + S) × P** **SP= (3 + 1 + 1)× 1** **SP =5**

Potential impact	Impact Significance without Mitigation	Proposed Mitigation Measures	Impact Significance with mitigation
Construction Phase			
Loss of archaeological and paleontological resources: During the construction phase, activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological and paleontological material or objects. Furthermore, the excavations work could uncover the following: stone foundations; ash middens associated with the farmsteads and homesteads that can contain bone, glass and clay ceramics; ash; metal objects such as spoons, knives, tools and other artefacts. However, there are no archaeological sites within the project site.	**Low** **(24)** **SP= (M + D + S) × P** **SP= (5 + 5 + 2) × 2** **SP = 24**	➢ Excavation for pump station and associated infrastructure should be limited to development area as approved by project plans. ➢ Measures must be taken to avoid any geological structure from being eroded and collapsing, and in the process causing loss of archaeological and paleontological resources. ➢ Regular Archaeological Watching Briefs should be carried out during construction in case any chance findings are made. ➢ Should any artefact or heritage resource be encountered, the contractor is advised to stop the operation immediately, inform the ECO who must refer the matter to KwaZulu-Natal Amafa and Research Institute attention.	**Negligible** **(5)** **SP= (M + D + S) × P** **SP= (3 + 1 + 1) × 1** **SP = 5**
Destruction of heritage resources: The excavation works are most likely to cause disturbance or destruction of non-renewable heritage resources. However, the project site is highly transformed and outside urban area, with no evidence of heritage resources within the locality of the project site.	**Low** **(22)** **SP= (M + D + S) × P** **SP= (5 + 4 + 2) × 2** **SP = 22**	➢ Excavation works for pump station and associated infrastructure should only be be limited to development area as approved by project plans. ➢ A CFP should be implemented where possible heritage finds are uncovered/ discovered. ➢ Should any artefact or heritage resource be encountered, the contractor is advised to stop the operation immediately, report to the ECO	**Negligible** **(5)** **SP= (M + D + S) × P** **SP= (3 + 1 + 1)× 1** **SP =5**

Potential impact	Impact Significance without Mitigation	Proposed Mitigation Measures	Impact Significance with mitigation
Construction Phase			
		who must refer the matter to KwaZulu-Natal Amafa and Research Institute for attention. Therefore, a heritage practitioner / archaeologist must be engaged in the event that any possible heritage resources or artefacts are identified.	
Air pollution, dust and emissions: Dust could be generated during construction as a result of earthworks and stockpiles for the weir upgrading construction. The major dust sources could emanate from the movement of vehicles on access road transporting material and equipment to the working areas. Furthermore, transportation and storage of fine sand, spoils and cement could result in dust. Emissions from construction vehicles, especially those poorly maintained will result in air pollution.	**Medium** **(36)** **SP= (M + D + S) × P** **SP= (5 + 1 + 3) × 4** **SP = 36**	➢ Apply dust suppression to exposed soil and stockpiles. All transported and stored fine product must be covered to prevent spills and been blown by wind. ➢ Excavated material is to be stockpiled along the trench within the working servitude for later backfilling, of not more than 1.5m in height. ➢ Limit on-site vehicle speed to 40 km/h or lower due to driving conditions. ➢ All fine products must be covered during transportation. ➢ Minimise gas emission through regular servicing of construction vehicles to meet minimum emission requirements.	**Negligible** **(7)** **SP= (M + D + S) × P** **SP= (3 + 1 + 3) × 1** **SP =7**
Aesthetic / visual Impact: The viewshed area and zone of visual influence for the proposed weir upgrade is considered ***"low visibility"*** as it can be visible from a small area	**Very Low** **(12)**	➢ Concentrate the construction activity and temporary infrastructure in a designated place. In this regard the site camp, must be constructed close enough to the construction	**Negligible** **(4)**

Potential impact	Impact Significance without Mitigation	Proposed Mitigation Measures	Impact Significance with mitigation
Construction Phase			
around the project site (<1km radius). As this project will take place outside urban area but adjacent to urban area this development would likely blend and be streamlined with the existing local environment. However, during the construction phase, residents who live in close proximity to or overlook the proposed project site will experience a change in their existing views as residents will have a view of the construction site characterized by exposed earth and machinery.	**SP= (M + D + S) × P** **SP= (3 + 1 + 2) × 2** **SP = 12**	area to avoid high visibility of construction activities. ➢ The contractor should maintain good housekeeping on-site to minimise waste generation and avoid litter. ➢ Dust suppression is important to reduce the visibility of the development. ➢ Excavated material is to be stockpiled along the trench within the working servitude for later backfilling, of not more than 2m in height. ➢ Avoid the use of floodlight at site camp. Also, the light must not face the neighboring homesteads and oncoming traffic on the rural access roads.	**SP= (M + D + S) × P** **SP= (1+ 1 + 2) × 1** **SP = 4**
Noise pollution: The main sources of noise associated with the proposed construction activities include the following: construction activities and equipment delivery. Construction activities are likely to be confined to daytime and the noise levels will only affect the adjacent areas for a relatively short period of time.	**Medium** **(40)** **SP= (M + D + S) × P** **SP= (5 + 1 + 2) × 5** **SP = 40**	➢ In recognition of the inherently noisy and temporary nature of construction activities, specify standard construction hours during which the usual fixed noise limits do not apply. ➢ Ensure that operating hours as determined by the EA are adhered to. Where not defined, development must be limited to daylight hours. ➢ All vehicles must be maintained in accordance with manufacturer's specifications to avoid excessive noise.	**Very Low** **(15)** **SP= (M + D + S) × P** **SP= (2+ 1 + 2) × 3** **SP = 15**

Potential impact	Impact Significance without Mitigation	Proposed Mitigation Measures	Impact Significance with mitigation
Construction Phase			
Traffic impact: During construction of the pump station and associated infrastructure it is likely that the traffic could be disturbed, as a results of trucks transporting materials turning from the main road to access road to site, vice versa. In addition, there will also be an increase in construction vehicles in and around the proposed site. However, it will be of temporary duration as it will only last for the construction duration of the project. Local community members (especially children) and stock animals could be exposed to vehicle risks during construction activities and the movement of vehicles and equipment into and out of the project sites	**Medium** **(40)** **SP= (M + D + S) × P** **SP= (5 + 1 + 2) × 5** **SP = 40**	➢ Appropriate temporary signage, traffic control signals, delineators, message boards, must be used for traffic accommodation in the work zone, truck turning points and shall be visible by motorists and pedestrians. ➢ Establish speed limits at an approach to construction vehicle turning point where the road conditions dictate, vehicles must be driven slower and with an awareness of potential risks. ➢ Limit on-site vehicle speed to 40 km/h or lower due to driving conditions.	**Negligible** **(10)** **SP= (M + D + S) × P** **SP= (2 + 1 + 2) × 2** **SP =14**
Waste emanating from construction activities: As in other such operations, the general, health care and hazardous wastes are more likely inherited from construction activities.	**Medium-High** **(50)** **SP= (M + D + S) × P** **SP= (5 + 2 + 3) × 5** **SP = 50**	➢ Educate of workers on pollution prevention practices. Training programmes must provide information on material handling and spill prevention and response. ➢ Have sufficient and separate bins for general, medical and hazardous waste disposal by implementing the Integrated Waste	**Negligible** **(8)** **SP= (M + D + S) × P** **SP= (2 + 1 + 1) × 2** **SP = 8**

Potential impact	Impact Significance without Mitigation	Proposed Mitigation Measures	Impact Significance with mitigation
Construction Phase			
		Management approach: segregation of waste into separate bins and clearly marked for each waste type. ➢ Refuse must be removed regularly to licensed landfill sites. ➢ Hazardous waste must be stored in a secured waste receptacle and disposed of at a registered waste disposal site. ➢ Adequate sanitary facilities and ablutions on the project site must be provided for all personnel throughout the project area. ➢ All waste manifest and disposal certificates must be kept on record	

Potential Impacts	Impact Significance without Mitigation	Proposed Mitigation Measures	Impact Significance with mitigation
Operation Phase			
Soil erosion and geological degradation: Continuation in eroding of *in-situ* material, such as geological formation of sandy soils of *Fw10/Fw11 Fernwood soil series* erosion at sloping areas.	**Medium-High (50)** **SP= (M + D + S) × P** **SP= (5 + 3 + 2) × 5** **SP = 50**	➢ Construct storm water system and make provision for erosion protection. ➢ Installation of gabion baskets and mattresses, energy dissipaters and grass lined drains ➢ Stormwater management through regular inspection for evidence of sediment and debris build-up during wet season.	**Negligible (10)** **SP= (M + D + S) × P** **SP= (5 + 3 + 2) × 1** **SP =10**
Impact of sewer discharge and ingress water: Given that the sewer system are prone to overflow and discharge during operation. The proposed Nordale Sewer Pump station mighty pose environmental hazard during incident of sewer discharge and overflow.	**Medium-High (50)** **SP= (M + D + S) × P** **SP= (5 + 3 + 2) × 5** **SP = 50**	➢ Engineering design to mitigate run-off during sewer discharge. ➢ The sewer overflow containment procedures must be in place.	**Negligible (7)** **SP= (M + D + S) × P** **SP= (5 + 1 + 1) × 1** **SP = 7**
Overall Mean significance: Nature of a project without mitigation	**Medium-High (50)**	Nature of a project post mitigation	**Very Low (13)**

15 CUMULATIVE IMPACT ASSESSMENT AND MITIGATION MEASURES

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

Table 7: Cumulative Impacts

Impact	Description	Mitigation
Prefoliation of alien plant species	The project site has been largely modified with its current condition consisting predominantly by alien thicket. Coupled with sewer, overflow the site vegetation clearance especially within a the site and adjacent wetland would likely cause percolation of alien and weed plant species.	All clearance must be limited to areas as demarcated and approved by project plans. Have alien removal plan, and progressively rehabilitate the site during construction and operational phase.
Deterioration of ground water quality in nearby wetland system as a result of sewer overflow during pump station operation.	Given that the sewer system is prone to overflow and discharge during operation. The proposed Nordale Sewer Pump station mighty pose environmental hazard during incident of sewer discharge and overflow. In the process deteriorate the ground water quality, and wetland system.	Engineering design to mitigate run-off during sewer discharge. The sewer overflow containment procedures must be in place.
Soil erosion and geological degradation	The project site is likely to affected by erosion as the geological formation	Construct storm water system and make provision for erosion protection.

	comprise of sandy soils of *Fw10/Fw11 Fernwood soil series*, with a relatively low erosion resistance	Vegetation clearance should be kept as minimal as possible to areas as demarcated by the project plans and to make use of natural erosion suppressors such as good grassland cover. Excavation should be limited to development area as approved by project plans. Also be carried out in a manner to promote stable development of the site. It is recommended that excavation be carried out along the guidelines given in SANS 1200 (current version).

16 RECOMMENDATIONS BY SPECIALISTS

There were two specialist studies undertaken for this Environmental Assessment, namely:

- Wetland Delineation Assessment; and
- Terrestrial Ecological Impact Assessment;

16.1 Recommendations by a Wetland Specialist

The Aquatic Ecological Impact Assessment was conducted by Zonhla Hydro and Enviro Consulting (Pty) Ltd. and the following recommendations were made:

16.1.1 Working within wetland systems

There are FEPA Wetlands 500m buffer coverage. These wetlands form part of the *Indian Ocean Coastal Belt Group 1* (NFEPA WetVeg). The landscape settings of the identified wetlands are described as bench (HGM1 1) and slope (HGM 2) floors.

A field investigation has determined that the study area is within HGM 2 wetland unit dominantly infested by alien vegetation and weeds with patched of *Imperata Cylindrica grasslands vegetation*.

a) An Environmental Control Officer (ECO) must oversee the construction phase of the project, with wetland areas as a priority.

b) Owing to the proposed sewer pump station and gravel access road being within the regulated 500m radius of the delineated HGM 1 and 2 units, it is therefore the specialist understanding that the proposed activities may trigger the Section 21 (c) and (i) of the NWA No. 36 of 1998, namely:

   - Section 21 (c)- Impeding or diverting the flow of water in a watercourse; and
   - Section 21 (i) - Altering the bed, banks, course or characteristics of a watercourse.

c) Based on the this, it is the specialist opinion then that the project meets the requirements of the "General Authorisation (GA) in terms of Section 39 of the NWA No. 36 of 1998, Water Uses as defined in Section 21(c) and (i)", Notice 509 of 2016. Therefore, a GA in terms of GN 509 should be applied for with the DWS for the proposed project.

d) Construction method statements are to be adhered to. These method statements should consider the environmental facets associated with the wetland and streams such as hydrological flow regimes, flora and fauna. These should be approved by the relevant departments (i.e. EDTEA and DHSWS).

16.1.2 Construction Footprint Limit and Demarcation

a) A site layout plan must be compiled indicating the limits of disturbance associated with the sewer pump station and gravel access road in relation to the identified sensitive areas (i.e. wetland and streams). No-go areas and any stormwater infrastructure must be indicated on this plan.

b) The 15m wetland buffer zones must be demarcated as the no-go areas.

c) All construction activities must be limited to the construction servitude.

16.2 Recommendations by a Terrestrial Ecological Specialist

The hydrological investigations were conducted by Mondise Environmental Services (Pty) Ltd, and the following recommendations were made:

16.2.1 Planning (Design) and construction phase

During the Planning and Design and construction Phases of the proposed project, all mitigations outlined below need to be adhered to.

a) An Environmental Control Officer (ECO) must be appointed to oversee construction activities.

b) A plan to actively rehabilitate the area used for construction post-construction needs to be developed.

c) Construction activities must be limited to the designated footprint of the project area.

d) Where vegetation has been cleared, site rehabilitation in terms of soil stabilisation and re-vegetation must be undertaken.

16.2.2 Construction phase

a) Construction activities need to be restricted to the areas demarcated by the project plans.

b) No indigenous vegetation outside the demarcated project boundaries must be removed.

c) Only the approved haul road must be used and vehicles must not traverse virgin land.

d) There should be minimal disturbance to areas in the immediate vicinity as successful vegetation recovery will depend on the remaining vegetation.

e) Construction boundary must be demarcated and vegetation clearing and top soil removal limited to these areas.

f) Construction activities must be limited to the designated development footprint.

g) No poaching of any wild animals will be allowed.

h) The development area must again be surveyed prior to construction in order to locate and capture any SCC and relocate them.

16.2.3 Operation phase

a) Disturbed areas must be re-vegetated by seeding with plants that are natural to the area.

b) An alien removal plan must be implemented and run during operational phase.

c) A Rehabilitation Management Plan must be implemented.

17 RECOMMENDATIONS FROM THE ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

In light with the current status quo of Mtubatuba sewer challenges including inevitable high sewer discharge and overflow within the Mtubatuba, these scenarios will continue to impose ecological and environmental health hazard within Mtubatuba community (***Section 6***). Therefore, the proposed Nordale Sewer Pump station and associated infrastructure provide the communities of within Mtubatuba with adequate and efficient sewer reticulation system, and connection of Nordale Township into municipal sewer reticulation system which is safe, reliable and sustainable to the benefit of the public for the realisation of the Sustainable Development Goal 6 and the NDP objectives through this project.

The National Web-Based Environmental Screening Tool (NWBEST) was used to generate the environmental sensitivity report of the proposed development site. Additionally, an Initial Site Sensitivity Verification study was undertaken to confirm or dispute the environmental sensitivity as identified by the NWBEST was conducted.

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

17.1 Planning Phase

The following conditions and mitigation measures are recommended and should be considered during the planning:

a) Best practice sewer pump station and access road design, and construction practices to be followed to provide good drainage and prevent erosion within the project area.

b) A detailed method statement consistent with the best practice weir design and construction be developed by the engineering consultants prior to the commencement of the project and that their supervision of the contractor during construction ensures compliance by the contractor with best practice.

c) The design of the storm water system must make provision for erosion protection.

d) Demarcate the project servitude and establish no-go areas, through providing that all vegetation clearance should be kept as minimal as possible to areas as demarcated by the project plans.

17.2 Construction phase

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

17.2.1 Erosion and sediment loads control

It is anticipated that the vegetation clearance and excavation during construction of Nordale Sewer Pump station and associated access road will be undertaken within 500m FEPA coverage underlain by a *Zululand Group Formation* of sandy soils of *Fw10/Fw11 Fernwood soil series*, with a relatively low erosion resistance which would likely exacerbate sediment loads or erosion within the wetland system.

a) Best practice sewer pump station and access road design, and construction practices to be followed to provide good drainage and prevent erosion within the project area.

b) Sediment barriers must be installed in areas sensitive to erosion such as near water supply points, slopes, and actively eroding sloping areas. These measures include but are not limited to the use of sand bags, geotextiles such as soil cells used in the protection of slopes, hessian sheets, rock gabions, silt fences and retention or replacement of vegetation. These erosion control measures must also be used during progressive rehabilitation of the site, where necessary, during and after construction activities.

c) After every rainfall event, the contractor must check the site for erosion damage and immediately repair any damage recorded.

d) Unnecessary clearing of natural areas should be kept as minimal as possible to make use of natural erosion suppressors such as good grassland cover.

e) Detailed method statement for working within wetland coverage must be compiled by the contractor prior to the commencement of the project.

f) Demarcate the site servitude for the development and the demarcation fence must be signed off by the Environmental Control Officer (ECO).

g) No clearance and excavation must be done outside site servitude. The site clearance and excavation must be limited to development area (construction servitude) as approved by project plans. Also, make use of natural erosion suppressors such as progressive rehabilitation using good grassland cover. Do not wait for construction to finish in order to start rehabilitation.

h) Construct storm water system and make provision for erosion protection.

i) Excavations must not be left open for a long duration and must not be undertaken until such time that all required materials are available on-site.

j) Density control of placed fill material should be undertaken at regular intervals during fill construction.

17.2.2 **Soil management**

It is anticipated that construction activities for the purpose of Nkandla Weir upgrade will likely have impact on Mhlathuze River within the locality of the downstream of Nkandla Weir.

a) Prior to commencing with earthworks, the topsoil must be stripped and stockpiled separately from subsoil, if necessary.

b) All stockpiles including striped top soil must be established, ideally on flat ground not exceeding 2m height at least 30m buffer from the wetland systems.

c) If at risk of being eroded, all stockpiles must be secured with sandbags around the base of the soil stockpile. Sediment barriers must be installed in areas sensitive to erosion to prevent stream siltation.

d) After every rainfall event, the contractor must check the site for erosion damage and immediately repair any damage recorded.

e) Topsoil must be kept for use during rehabilitation of disturbed areas.

f) All stockpiles must be kept free of weeds and invasive alien plants.

17.2.3 Wetland systems ground water pollution prevention measures

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

b) Chemical toilets must be placed at least 30m away from any watercourse habitat.

c) Fuel must be stored in a bunded structure with a roof. The bund must be able to contain at least 110% of the volumes of fuel.

d) Mixing and/or decanting of all chemicals and hazardous substances must take place on a tray, shutter boards or on an impermeable surface.

e) Drip trays should be utilised at all dispensing areas.

f) A chemical spill kit must be present onsite at all times and once used it must be disposed of at a registered hazardous landfill site.

g) During construction of wet well within EGL, when required the dewatering must be approved by the Department of Water and Sanitation. And meter recording to be provided. Also, ECO to conduct the ground water quality during the dewatering process.

h) Detailed method statement for working within the systems with provision for spillage and construction debris management must be compiled by the contractor prior to the commencement of the project.

i) It is highly recommended that site camp be developed at already disturbed site, on ideal flat surface area which is at least 100m away from the wetland system buffer. Also, the construction machinery must be parked only at site camp on the designated bunded areas and dip trays must be placed under the machinery, when not used to capture any possible hazardous substance leaks.

17.2.4 Invasive Alien Plant control

a) The control and eradication of a listed invasive species from the construction footprint, including the site camp must be carried out using methods that are appropriate for the species concerned and the environment within which it occurs.

b) The methods employed to control and eradicate a listed invasive species must also be directed at the new growth, propagating material and re-growth of such invasive species in order to prevent such species from producing offspring, forming seed, regenerating or re-establishing itself in any manner.

c) Mechanical control methods such as digging, hoeing, pulling out of weeds and invasive plants are recommended.

17.3 Operation and maintenance

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

17.3.1 Stormwater management

The stormwater management is critical to mitigate the run-off of ingress water and erosion control within the pump station.

a) The project design must take into consideration stormwater management. The design of the storm water system must make provision for erosion protection, channelling away ingress water from pump station vicinity and preventing it to overflow the pump station's wet well.

b) Develop and implement the stormwater management plan throughout the construction and operational phase.

c) Ongoing maintenance and monitoring regimes be implemented for the stormwater management system. Such as inspection for evidence of sediment and debris build-up, particularly on a regular basis during the wet season and after any rainfall events during the dry season.

17.3.2 Management of sewer effluent discharge and overflow

To minimise the risk of environmental and water resources pollution as a result of the sewer effluent discharge and overflow at sewer pump station.

a) Construction best practice that follows engineering designs to mitigate the impact of effluent discharge and overflow during operation and maintenance.

b) Development an Operation and Maintenance Plan, as well as Effluent Spillage Contaminant Procedure for the Nordale Sewer Pump station.

18 CONCLUSION

The decision to grant or refuse authorisation in terms of Section 24 of NEMA must be made in the light of the provisions of NEMA. Section 24 provides that, in order to give effect to the general objectives of integrated environmental management laid down in NEMA, the potential impact on the environment of listed activities must be considered, investigated, assessed and reported on to the Competent Authority charged by the Act with deciding applications for environmental authorisation. A Basic Assessment Report (BAR) concerning the impact of the proposed activity and alternative activity options on the environment, has been compiled and submitted as prescribed and authorisation may only be issued after consideration of such report.

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

Based on comparative evaluation of the various alternatives, including the No-Go option, it is evident that the preferred Location/Site Alternative for the construction of Nordale Sewer Pump station can meet the required objections to offset the No-Go option (subject to the implementation of recommended development mitigation measures). This Draft BAR (DBAR)

therefore, concludes that the proposed development has been considered via a balanced approach, mindful of cumulative impacts, need and desirability of the project and that the overall negative environmental impacts will be of very low significance. As such, the project can be considered for environmental authorisation subject to implementation of the recommended phased approach and specialist mitigation measures as specified in the EMPr.

This DBAR is available for a review and comment period of 30 days, extending from 05th of May 2021 to the 10th of June 2021. Comments and submissions received in response to this report will be submitted to the competent authority.

Written submissions must be addressed to:

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APPENDICES

APPENDIX A. DECLARATION OF INFORMATION

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

04th May 2021

Signature | Date

EAP | **Emvelo Quality and Environmental Consultant**

Position | Company

APPENDIX B. ENVIRONMENTAL MANAGEMENT PLAN(EMPR)

APPENDIX C. SITE PHOTOGRAPHS AND LOCALITY MAPS

C-1: Case Images

C-2: Locality Map

APPENDIX D. SITE LAYOUT AND DESIGNS

APPENDIX E. PUBLIC PARTICIPATION PROCESS

E-1: Onsite notices

E-2: Newspaper advert

E-3: Register of I&APs

E-4 I&APs Involvement and Comments

E-5: Background Information Document (BID)

E-6: Minutes of the pre-application meeting

APPENDIX F. EAP'S CV(S)

APPENDIX G. SPECIALIST STUDIES

G-1: Wetland Delineation Assessment

G-2: Terrestrial Ecological Assessment

APPENDIX H: WEB-BASED ENVIRONMENTAL SCREENING REPORT