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JUNE 2022

DRAFT BASIC ASSESSMENT REPORT  
NORTHDALÉ SEWER PUMP STATION AND RISING  
MAIN

ETHEKWINI MUNICIPALITY  
EIA REF NO: DM/0021/2022



**This report was prepared by EnviroPro Environmental Consulting in terms of  
Appendix 1 to GNR 982**

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## Executive Summary

The eThekweni Municipality proposes to construct a new sewer pump station and rising main within Ward 62 of the eThekweni Municipality. An existing pump station and rising main are currently in place, however this aging infrastructure is extremely dilapidated and as a result, suffers from continual blockages. The existing pump station will therefore be demolished once the new infrastructure has been constructed and the existing rising main will be abandoned and left in place. The proposed new sewer pump station will be located at the following point location, 29°32'29.94"S; 31°7'52.25"E. The proposed new connection point for incoming sewage will be at the following point location, 29°32'29.87"S 31°07'53.50"E which will connect directly to the proposed new pump station. Sewage discharged from the new proposed pump station will then enter the new proposed 160mm Ø HDPE rising main which will be approximately 430m in length and will connect to an existing 160mm Ø gravity bulk sewer line at the following point, 29°32'38.58"S 31° 7'53.44"E. Although the entire area is urban, the site where the new pump station will be located as well as a portion of the rising main route will be within 32m of a watercourse in an area zoned as Public Open Space.

The construction of the new sewer pump station and rising main will have a positive socio-economic and environmental impact. The continual blockages that occur within the existing sewer infrastructure results in frequent spillages of raw sewage into the environment. This is not only detrimental to the local biophysical environment but also creates a health and nuisance impact for the nearby residents. The proposed sewer pump station and rising main will ultimately improve sanitation services in the area and ensure better protection of the local environment.

The following vital impacts and mitigation measures were assessed:

- **Damage to the delineated wetland, the riparian area and the associated buffers:**  
Caution must be exercised when working near the delineated wetland and riparian area. Construction materials must be stockpiled outside the recommended buffer of 20m for wetlands and 30m for riparian areas. Heavy vehicles must be kept outside the recommended buffers except where needed for the construction process. The construction footprint must not be widened more than is strictly necessary.
- **Degradation and destruction of riparian and wetland vegetation:**  
No construction activity and/or construction-related activity must be undertaken within the 20m buffer area of the wetland habitat or the 30m buffer of riparian areas. These sensitive habitats must be clearly demarcated and regarded as 'no-go' areas i.e. construction staff must not be permitted access. Areas to be developed must be specifically demarcated to prevent movement of workers into sensitive surrounding environments during construction.
- **Decreased groundwater quality beneath and down-gradient of the site during operation:**  
The Northdale pump station and rising main must be managed by trained competent personnel. A maintenance schedule and checklist must be compiled and strictly adhered to. Any complaints received from the residents regarding odour must be investigated. A bi-annual surface water monitoring plan must be implemented.
- **Cessation of all raw sewage spillages within the community and environment:**  
This is a positive impact which is the aim of the proposed development.

These impacts can be mitigated by following the recommendations in this report and EMP. Construction activities will be monitored and controlled through the implementation of the Environmental Management Programme (EMP).

Only one feasible site alternative was identified due to the incoming sewer infrastructures location and the sites gradient. Two technology alternatives were investigated with the preferred technology alternative being to construct a new pump station and rising main. Technology Alternative 1 would be to refurbish the existing pump station which would require the construction of temporary conservancy tank/s to service the area while the pump station is offline. Conservancy tanks are quick to build, however, the running costs are very high due to the transportation requirements, as all sewage has to be pumped out and transported to the nearest wastewater treatment works. Maintenance of the conservancy tanks as well as the transportation costs and risks associated with spillages should the conservancy tanks not be emptied regularly and start to overflow make this option less viable from a socio-economic and environmental perspective. Connection to a waterborne sewage connection is considered preferable to on site management and disposal especially when a sewage connection is available. Constructing a new pump station and decommissioning the existing one is the preferred option. Both alternatives would have a similarly sized construction footprint.

Taking impacts and mitigation measures into consideration the EAP is of the opinion that there are no significant environmental impacts associated with the proposal, which cannot be mitigated. Therefore, it is recommended that the preferred site and technology alternative be authorised for the Northdale sewer pump and rising main.

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## Section 1: Scope of Work and Location of Activity

### 1.1 Project Title

Northdale sewer pump station and rising main

### 1.2 A Description of the Activities to Be Undertaken Including Associated Structures and Infrastructure As per Section 3(d) (ii)

The eThekweni Municipality proposes to construct a new sewer pump station and rising main within the urban edge associated with the town of Maidstone in Ward 62 of the eThekweni Municipality (Figure 1). An existing pump station and rising main are currently in place, however, this aging infrastructure is extremely dilapidated and as a result, suffers from continual blockages. The existing pump station will therefore be demolished once the new infrastructure has been constructed and the existing rising main will be abandoned and left in place. The proposed new sewer pump station will be located at the following point location, 29°32'29.94"S; 31°7'52.25"E. The proposed new connection point for incoming sewage will be at the following point location, 29°32'29.87"S 31°07'53.50"E which will connect directly to the proposed new pump station. Sewage discharged from the new proposed pump station will then enter the new proposed 160mm Ø HDPE rising main which will be approximately 430m in length and will connect to an existing 160mm Ø gravity bulk sewer line at the following point, 29°32'38.58"S 31° 7'53.44"E.

The new proposed pump station and 140m of the proposed 430m long rising main will be located within 32m of a watercourse in an area zoned as public open space as per eThekweni Municipality's northern town planning scheme. The remaining portion of the pipeline although part of the application does not require Environmental Authorisation and such has not been assessed in this application (Figure 2).

Please note all proposed works will be taking place outside of the delineated watercourses on site (Figure 3). A portion of the site also falls within an area designated as D'MOSS. This designation is not a zoning however it is rather an important special tool used by the eThekweni Municipality with regard to maintaining ecosystem linkages.

The works that require Environmental Authorisation have been summarized below. See Figure 4 below for a visual representation of the sections of the project that require environmental authorisation and Appendix A - Design Drawings and Maps:

- Northdale Pump Station (located in public open space):
  - The fenced area of the pump station site has a total footprint of 218m<sup>2</sup> and will include the following items:
    - Generator (4m<sup>2</sup>)
    - Overflow manhole (3m<sup>2</sup>)
    - Pump station building (47m<sup>2</sup>)
    - Toilet (4m<sup>2</sup>)
    - Wash down slab (1m<sup>2</sup>)
  - The pump station building will be divided into two wells, i.e. a dry well and a wet well;
  - A 30m (166m<sup>2</sup>) new access road will also form part of the proposal to connect the new pump station to the existing access roads.
  - A stormwater cut-off drain and associated outlet with a reno mattress will form part of the pump station site.
- Rising Main Pipeline (160mm Ø HDPE pipe):
  - The total length of the rising main outside the pump station site that requires Environmental Authorisation is 80m;
  - A 1m wide trench will be required to install the rising main which will have a total area of 80m<sup>2</sup>.

The construction of the new sewer pump station and rising main will have a positive socio-economic and environmental impact. Due to continual blockages of the existing sewer infrastructure, there are frequent spillages of raw sewage into the environment. This is not only detrimental to the local biophysical environment but also creates a health and safety risk as well as a nuisance impact for all nearby residents. The proposed sewer pump station and rising main will ultimately improve sanitation services in the area and ensure better protection of the local receiving environment.

Taking the above project description into consideration and the proposed works, the Northdale sewer pump station and rising main project will require Environmental Authorisation through a Basic Assessment for the following reasons:

- Construction of 464m<sup>2</sup> infrastructure within 32m of a watercourse in an area zoned as public open space as per eThekweni Municipality's northern town planning scheme (Listing Notice 3, Activity 14).

Figure 1: Locality Map

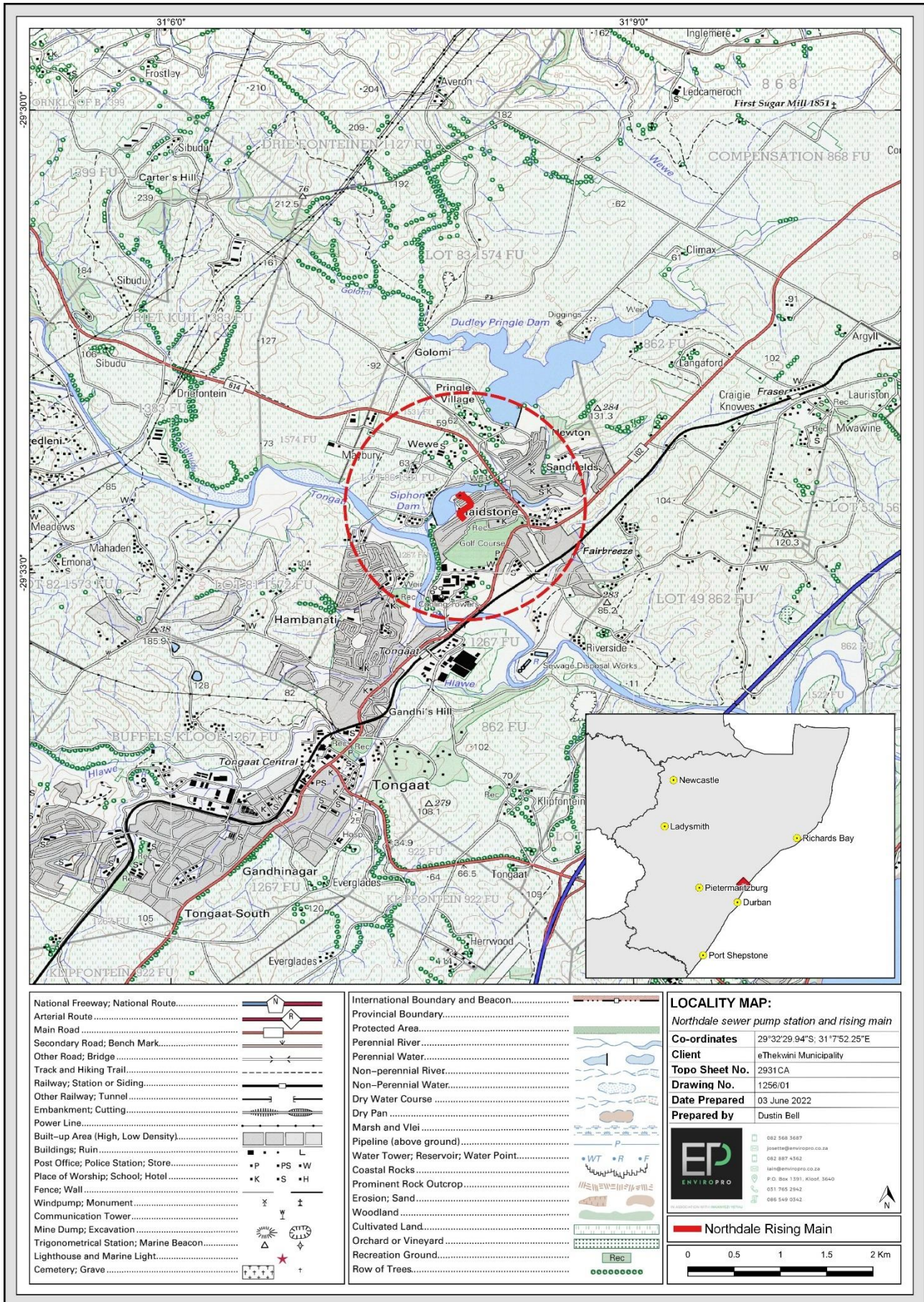




Figure 2: Aerial Photograph Showing Zoning Of the Site

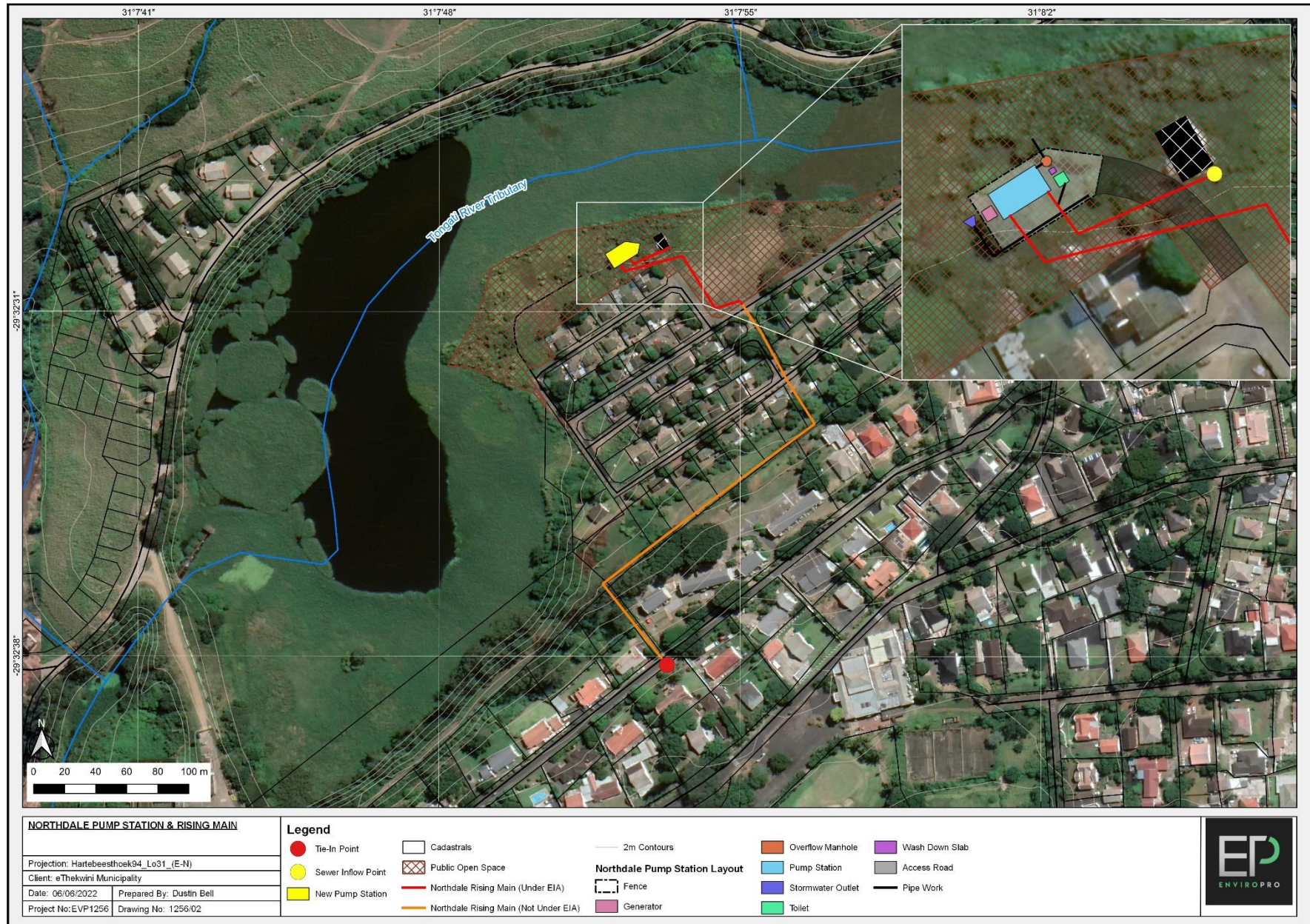


Figure 3: Aerial Photograph Showing All Watercourse in And Around the Site

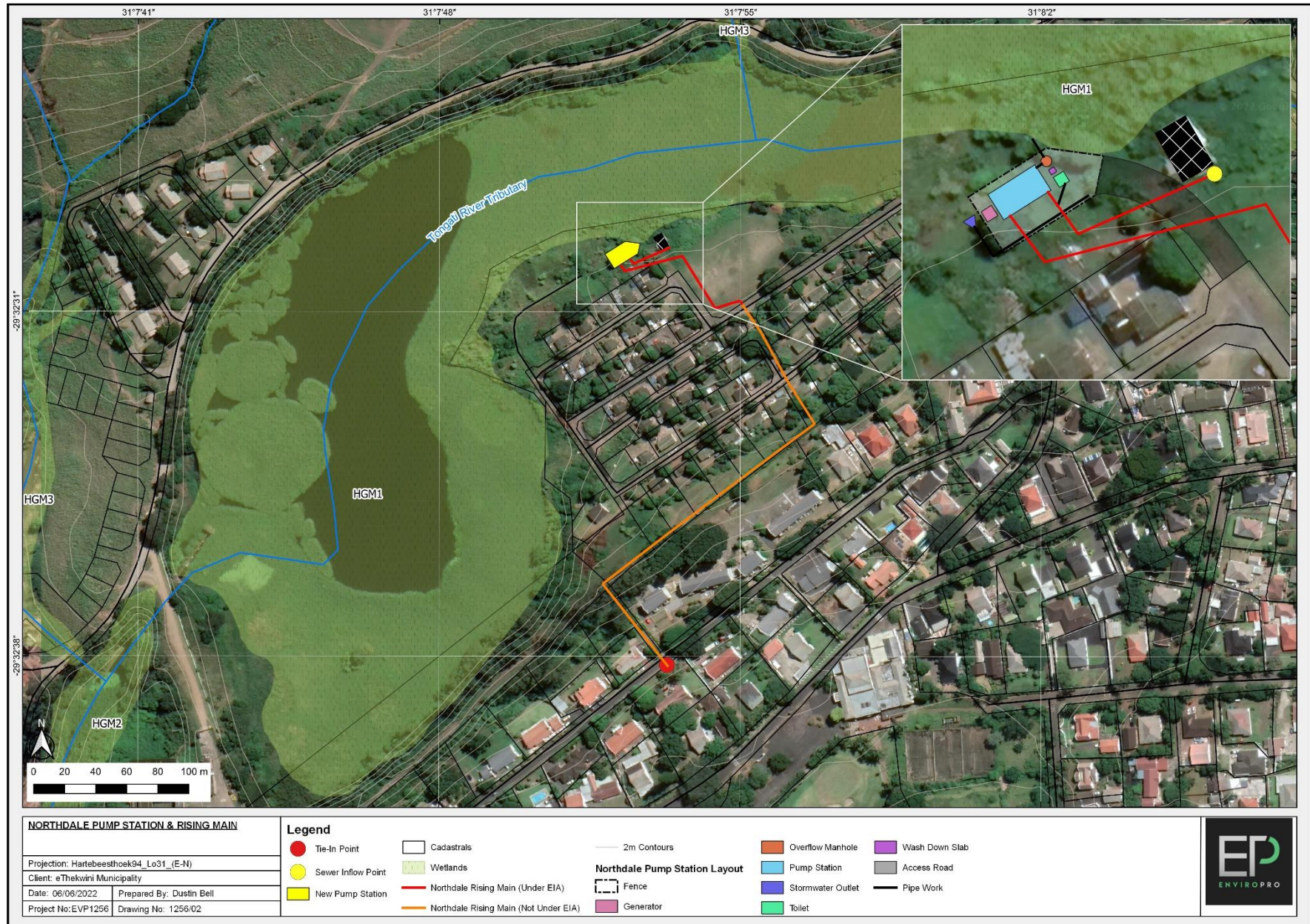
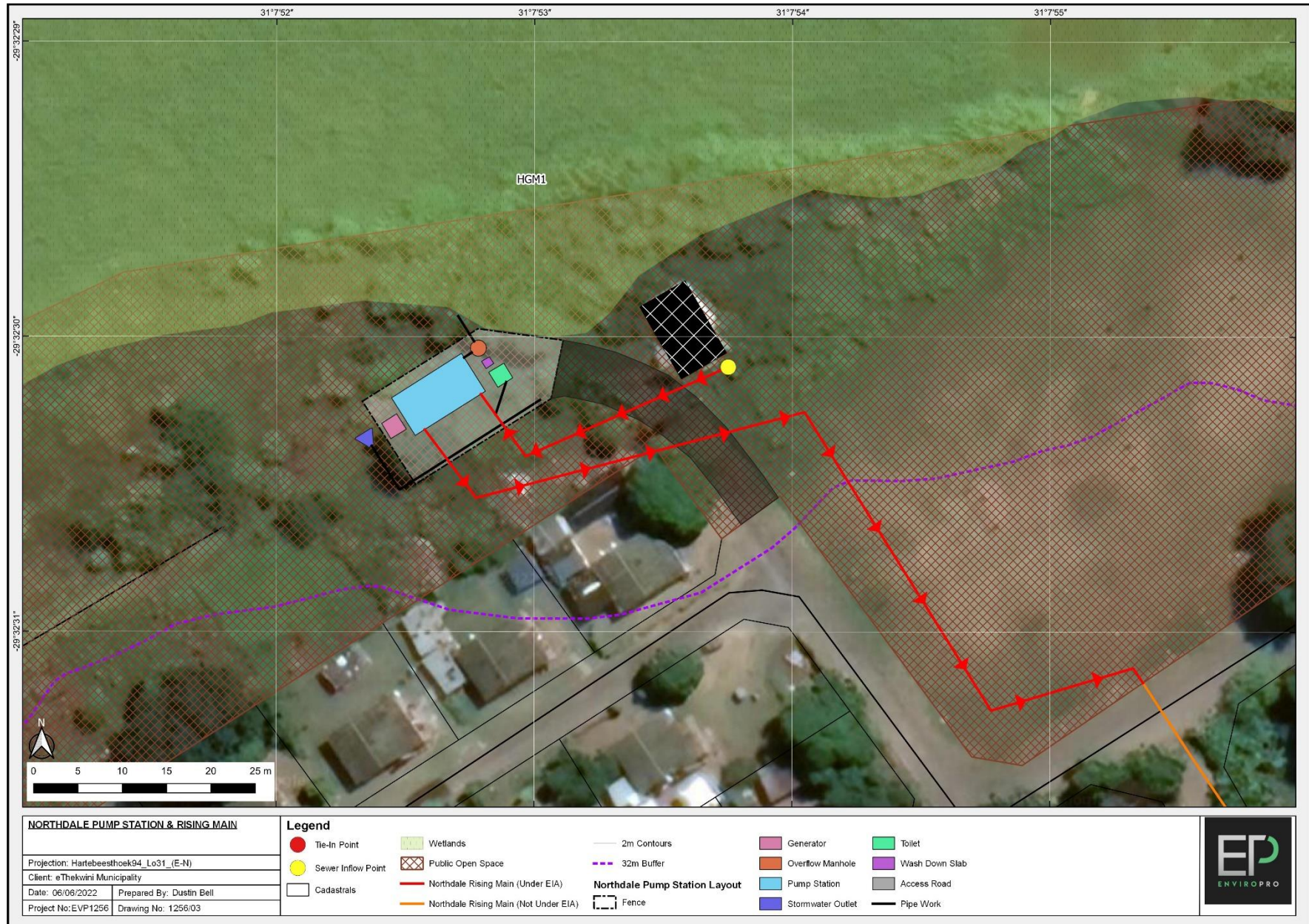


Figure 4: Aerial Photograph Showing Sections of the New Rising Main and the New Pump Station That Require Environmental Authorisation



### 1.2.1 Construction Methodology

The following provides the construction methodology for the project:

- Necessary clearing and grubbing of the site for access and construction of the works will be carried out. This will include the clearing of vegetation from within the construction footprint. Permission for the removal of any tree on the site must be obtained from the ECO. Please note the vegetation clearing on-site will be less than 1ha, with most of the vegetation to be removed comprising of alien invasive vegetation. Clearing and grubbing of the site will be undertaken by heavy machinery i.e. a TLB.
- Remove topsoil and stockpile for later use.
- Excavate trench for pipeline and the footprint for the pump station to the design levels.
- If the material is firm, normal excavation techniques will apply. In soft material, shoring of the excavation sides may be required. In hard rock material, trench excavation may require the use of pneumatic breakers.
- Install temporary de-watering pumps to keep the excavation dry (if required due to groundwater ingress).
- Construct stormwater diversion berms where required.
- The concrete base slab and side walls will be cast on the pump station site to enable the fitting of the pump station components including the dry and wet wells. A concrete slab will also be cast on top of the structure.
- Bedding material will be placed along the pipeline trench
- The pipeline will be laid and compact selected fill will be placed over the pipeline.
- Manholes will be constructed at selected points along the pipeline route at changes in grade and direction.
- All excavations will be backfilled to design specification.
- Finally, rehabilitation / re-vegetation of all areas affected by the construction activities using intensive grass sod planting or hydroseeding with a suitable indigenous grass seed mix will be undertaken. The indigenous grass seed mix will be approved by the ECO.

### 1.3 Description of Feasible Alternatives as Per Section 3(h)(i)

#### Site Alternatives

##### **Site Alternative 1** (Preferred Alternative)

The project entails the construction of a new pump station and rising main. When looking at macro scale site alternatives no other alternatives are feasible as the existing infrastructure already routes to this site and re-locating the pump station anywhere other than the site proposed would require re-routing of significant sewer infrastructure at a regional scale. This would not be feasible from either an economic or environmental perspective.

When looking at site alternatives at a micro-scale perspective, placing the pump station either further south or east. The existing bulk sewer pipeline feeding the pump station is gravity fed and locating the new pump station upgradient would not be feasible from an economic point of view as the feeder bulk sewer line would then need to be re-routed, which would incur additional costs. Siting the new pump station upgradient from the incoming sewer tie-in point is also not feasible from an engineering perspective as the drainage of sewage would be hindered (see Figure 5 showing gradients of the site). In addition, the proposed pump station could not be located in the area north of the existing pump station due to space constraints (see Figure 6). The distance between the current pump station and the edge of the waterbody associated with the wetland is approximately 13m. This distance is too small to maintain a safe working distance between the new infrastructure and the existing infrastructure which will remain functioning during the duration of construction. Therefore, the only feasible site alternative from a micro-scale perspective is to situate the site west of the existing pump station at the preferred location. Please note the land on which the project is being proposed is all privately owned and therefore the proposed location is dependent on the landowner's consent.

In terms of the rising main site alternative, no other routes that would satisfy the engineering requirements were deemed possible.

Figure 5: Gradient of the Site (Source: Shuttle Radar Topography Mission (SRTM))

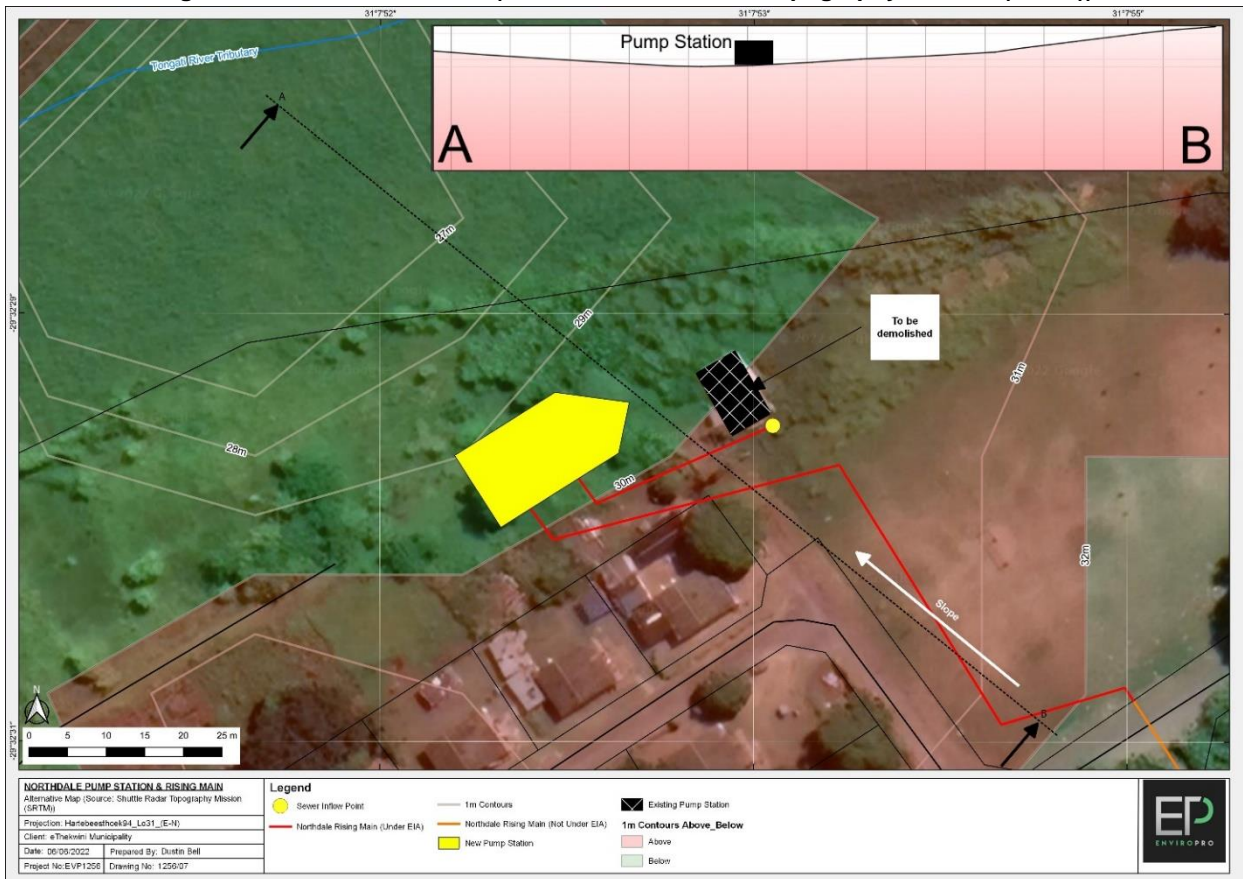


Figure 6: Oblique View of the Proposed Pump Station Site (Source: eThekweni Municipality, Oblique Viewer)



## Technology Alternatives

### **Technology Alternative 1** (Preferred Alternative)

The preferred technology alternative is to construct a new modern sewer pump station and rising main to replace the existing infrastructure in place. Please see Appendix A for design drawings.

### **Alternative 2**

Alternative 2 would be to fully refurbish the existing pump station and existing sewer pipeline reticulation. As the pump station would need to be non-operational during the refurbishment a temporary conservancy tank would need to be constructed whereby all sewage would need to be removed by honey suckers and transported to the nearest wastewater treatment works for disposal. Alternative 1 would require a construction footprint much similar to the preferred alternative and so the biophysical impacts would be very similar. However, due to the nature of a conservancy tank i.e. requiring continuous emptying, there is a potential for the conservancy tank to overflow as the sewage inflow would be continuous. Any spillages from the conservancy tanks would result in raw sewage entering directly into the delineated wetland. The potential for this to happen is low however if a spillage were to take place the risk rating would be high. For this reason, from an environmental perspective constructing a new pump station and decommissioning the existing one is the preferred option.

### **The No Go Alternative**

The existing Northdale pump station and sewer pipelines will remain in its current state. Blockages would continue to take place resulting in raw sewage spillages into the environment.

See Appendix A for Engineering Drawings.

## **1.4 All Listed and Specific Activities to Be Triggered and Being Applied For As Per Section 3(d) (i)**

**Table 1: All Listed and Specific Activities to Be Triggered and Being Applied For.**

<b>GNR</b>	<b>Activity Number</b>	<b>Activity as per the legislation</b>	<b>Activity as it applies to the proposal</b>
Listing Notice 3 of 2014 EIA Regs as amended	14	<p><i>The development of—</i></p> <p><i>(i) dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or</i></p> <p><i>(ii) infrastructure or structures with a physical footprint of 10 square metres or more;</i></p> <p><i>where such development occurs—</i></p> <p><i>(a) within a watercourse;</i></p> <p><i>(b) in front of a development setback; or</i></p> <p><i>(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.</i></p> <p><b>d. KwaZulu-Natal</b></p> <p><i>xi. Inside urban areas:</i></p> <p><i>(aa) Areas zoned for use as public open space;</i></p>	Construction of 464m <sup>2</sup> infrastructure within 32m of a watercourse in an area zoned as public open space as per eThekweni Municipality's northern town planning scheme

1.5 Location of Activity as per Section 3 (b)(i)-(iii)

Table 2: Location Information (Figure 6)

<b>Metro Municipality</b>	eThekweni Municipality																					
<b>Wards</b>	Ward 62																					
<b>Area / Town / Village</b>	Within the Maidstone suburb																					
<b>Co-ordinates:</b>	<b>Latitude</b>								<b>Longitude</b>													
<b>Pump Station:</b>	29°32'29.94"S								31°07'52.25"E													
<b>Incoming Sewage Tie-In:</b>	29°32'29.87"S								31°07'53.50"E													
<b>End of Pipeline Requiring EA:</b>	29°32'31.03"S								31°07'55.23"E													
<b>Property Description:</b>	Remainder of Sub 1 of Lot 86 No. 1531																					
<b>21 Digit Surveyor General no.</b>	N	0	F	U	0	0	0	0	0	0	0	0	0	1	5	3	1	0	0	0	0	1

## Section 2: Site Description and Surrounding Land Use as per section 3(h)(iv) and (k)

### 2.1 DFFE Screening Report

A Screening Report was generated via the DFFE Screening Tool (please refer to Appendix B for the full DFFE report) which details potential specialist reports that may be required based on a desktop level assessment conducted by the screening tool. Table 3 below summarises the screening tool recommendations, indicating whether they are applicable to the specifics of the site and project in question and where they are applicable, indicates the sections of the BAR where these have been addressed. As per the Screening Tool Guidelines, it is the responsibility of the EAP to confirm this list and to motivate in the BAR, the reason for not including any of the identified specialist studies by providing photographic evidence of the site situation.

**Table 3: National Screening Tool specialist requirements and comments**

Specialist Assessment	Conducted	Reason
Agricultural Impact Assessment	No	An agricultural impact assessment is not deemed necessary as the proposed pump station and rising main is to be undertaken on land that is zoned as public open space. Therefore it is the EAP opinion who is SACNASP registered that no agricultural areas will be negatively impacted by the pipeline and such the project is not considered to impact any agricultural activities and/or resources. Please refer to Figure 10 which provides photographic evidence of the site's characteristics.
Archaeological and Cultural Heritage Impact Assessment	No	The project area falls within the urban area associated with Maidstone. Refer to Figure 10 (photographs) which indicates the disturbed and urban nature of the site.
Palaeontology Impact Assessment	Yes	Please refer to <i>Paleontological Environment</i> under Section 2.8.
Terrestrial Biodiversity Impact Assessment	Yes	Please refer to <i>Flora and Fauna</i> under Section 2.4.
Aquatic Biodiversity Impact Assessment	Yes	Please refer to <i>Drainage Lines</i> under Section 2.3.1
Hydrology Assessment	No	As there will be no abstraction and discharge into any watercourse and therefore it was agreed upon with EDTEA that a Hydrology Assessment was not required. However please note a geohydrological Assessment was conducted for the project. Please refer to <i>Geohydrological Investigations</i> under Section 2.6
Geotechnical Assessment	Yes	Please refer to <i>Geotechnical Investigations</i> under Section 2.7
Socio-Economic Assessment	No	As the project is for the provision of public sewer infrastructure that will be replacing existing dilapidated infrastructure it was agreed upon with EDTEA that a Socio-Economic Assessment was not required.
Seismicity Assessment	No	A seismicity assessment is done to quantify seismic hazard and its associated uncertainty in time and space and to provide seismic hazard estimates. Due to the nature of the project, being a small scale sewage pump station and rising main, and following standard engineering practise a seismicity assessment was not deemed necessary.
Plant Species Assessment	Yes	Please refer to <i>Flora and Fauna</i> under Section 2.4, specifically Section 2.4.1 <i>Flora</i> .
Animal Species Assessment	Yes	Please refer to <i>Flora and Fauna</i> under Section 2.4, specifically Section 2.4.2 <i>Fauna</i> .



## 2.2 Topography and Physical Characteristics of Site

The following applies to the area surrounding the project area.

The gradient of the site is as per Table 4 below:

**Table 4: The gradient of the site.**

Gradient	Description
Flat	N/A
<b>1:50 – 1:20</b>	The site is virtually flat
1:20 – 1:15	N/A
1:15 – 1:10	N/A
1:10 – 1:7,5	N/A
1:7,5 – 1:5	N/A
Steeper than 1:5	N/A

The topographical features and landforms of the site and surrounding area are as per Table 4 below:

**Table 5: The topographical features and landforms of the site.**

Topographical Feature	Description
Ridgeline	N/A
Plateau	N/A
Side slope of hill/mountain	N/A
Closed valley	N/A
<b>Open valley</b>	The site is located in an open valley
Plain	N/A
Undulating plain/low hills	N/A
Dune	N/A
Sea-front	N/A

## 2.3 Surface Water

The following information has been obtained from the Water Resource Assessment for the Proposed Northdale Sewage Pump Station compiled by The Biodiversity Company (2020).

The project area is situated in the quaternary catchment U30D, within the Pongola to Mtamvuna Water Management Area (WMA 4). The site is drained by a tributary of the Tongati River, refer to Figure 2 above.

### 2.3.1 Drainage Lines

The sampling points for the study were selected to adequately assess the current state of the system to identify the potential risks that may result from constructing the sewage pump station and rising sewer main. The site ND1 is an upstream site and ND2 a downstream site of the existing sewage pump station.

#### 2.2.1.1. In situ water quality<sup>1</sup>

The *in-situ* water quality results indicate modified conditions within the reach due to upstream catchment activities which contribute to elevated dissolved solids and eutrophication. Please refer to Table 6 below:

**Table 6: *In situ* surface, water quality results**

Site	pH	Conductivity (µS/cm)	DO (mg/l)	Temperature (°C)
<b>TWQR*</b>	<b>6.5-9*</b>	-	<b>&gt;5.00*</b>	<b>5-30*</b>
<b>ND1</b>	6.90	5860	2.33	28.6
<b>ND2</b>	6.92	4950	5.05	26.2

\*TWQR – Target Water Quality Range.

<sup>1</sup> The Biodiversity Company (2020) Water Resource Assessment for the Proposed Northdale Sewage Pump Station – Appendix B

**2.2.1.2. Habitat Integrity Assessment<sup>1</sup>**

The results of the instream and riparian habitat assessment in the Tongati River tributary associated with the proposed Northdale sewage pump station upgrade indicate a largely modified state (class D) in the riparian habitat and the instream habitat.

**2.2.1.3. Riparian Habitat<sup>1</sup>**

Figure 8 below depicts the delineated riparian edge and its recommended 30m buffer in relation to the project area. The riparian edge and buffer area were determined by the water resources specialist<sup>2</sup>. The riparian areas for the Tongati River tributary associated with the project area are extensive and well established. It is comprised of a diverse range of trees, shrubs, grasses and sedges. Alien vegetation was noted during the survey in the riparian area such as *Colocasia esculenta* (elephant ear).

**Figure 7: Riparian Area of the Site**



**2.2.1.4. Aquatic Macroinvertebrate Assessment<sup>2</sup>**

The SASS5 assessment results indicated that both sampled sites are categorized as class C (Moderately modified) (Dallas, 2007). Please see Table 7 below.

**Table 7: Macroinvertebrate assessment results**

Site	SASS Score	No. of Taxa	ASPT*	Category (Dallas, 2007)**
ND1	90	20	4.5	Class C
ND2	88	19	4.6	Class C

<sup>2</sup> The Biodiversity Company (2020) Water Resource Assessment for the Proposed Northdale Sewage Pump Station – Appendix B

### 2.2.1.5. The Present Ecological State<sup>2</sup>

The Present Ecological State of the reach assessed for the study is presented in Table 8 below.

**Table 8: The Present Ecological State for the Tongati reach**

Category	Score	Ecological Category
Riparian	53.8	Class D
Macroinvertebrate	44.4	Class D
EcoStatus	Class D	

### 2.2.1.6. Fish Assessment<sup>2</sup>

The sampled fish results indicate 33% of the expected fish species were recorded during the survey. One of the vulnerable species Mozambique Tilapia (*Oreochromis mossambicus*) was found to be in the system. *Oreochromis mossambicus* is threatened by hybridisation with *O. niloticus* and therefore the proposed activities will not pose a threat to the species.

### 2.3.2 Wetlands<sup>2</sup>

One wetland was located within 32m of the proposed project area namely:

- Channelled Valley Bottom wetland (HGM1 within the Water Resource Assessment for the Proposed Northdale Sewage Pump Station report). Please note that other wetlands were identified within 500m of the proposed project area to compile with the requirements of the National Water Act, please refer to Figure 6-4 of the attached Water Resources Report within Appendix B for the full 500m wetland delineation.

#### 2.2.2.1. Present Ecological State (PES)<sup>2</sup>

The PES for the assessed HGM unit is presented in Table 9 below. The overall wetland health for HGM 1 was determined to be Largely Modified (class D).

**Table 9: Summary of the scores for the wetland PES**

Component	PES Rating	Description
Hydrology	E	<b>Seriously Modified:</b> The wetland unit is largely covered in alien vegetation which changes the water uptake and flows of surface water, the damming of this unit impacts on the flow velocities as well as the hydrodynamics of the system.
Geomorphology	D	<b>Largely Natural:</b> The seriously modified hydrology impacts the geomorphology through the alteration of the interaction between the wetland and the landscape. The damming of this unit has increased the wetland size upstream and altered the wetland shape downstream.
Vegetation	D	<b>Largely Modified:</b> The vegetation cover is largely alien vegetation in composition. With areas of deep flooding as a result of the dam.
Overall	D	<b>Largely Modified.</b> A large change in ecosystem processes and loss of natural habitats has taken place, but the natural habitat remains predominantly intact.

#### 2.2.2.2. Recommended Ecological Category<sup>3</sup>

The REC is set based on the combination of the PES and EIS values and is determined to set targets for the ecological state of the identified wetlands during and after the project has occurred. Table 10 shows the PES, EIS and the determined REC for HGM1. The wetland has a REC of class C. The pipeline construction must aim to not reduce these ratings.

**Table 10: Wetland recommended ecological categories based on the PES and EIS results**

HGM	Wetland Type	Overall PES	Overall EIS	REC
1	Channelled valley bottom	D	B	C (Improve)

### 2.3.3 Buffer Zones<sup>3</sup>

According to Ezemvelo KZN Wildlife,<sup>4</sup> a minimum recommended buffer size of 30m is required for wetlands within the province. The wetland buffer zone tool was used to calculate the appropriate buffer required for

<sup>3</sup> The Biodiversity Company (2020) Water Resource Assessment for the Proposed Northdale Sewage Pump Station – Appendix B

<sup>4</sup> Ezemvelo KZN Wildlife. (2013). Guideline: Biodiversity Impact Assessments in KwaZulu-Natal, Version 2.

the construction of the sewer pipelines. The model shows that during the construction phase the most significant risks are that of increased sediment and turbidity as well as possible inputs of toxic organic contaminants. The operational phase, however, has high risks associated with the pipeline. These are related to the risk of “increased nutrient and pathogen inputs”.

According to the buffer guideline,<sup>5</sup> a high-risk activity would require a buffer that is 95% effective to reduce the risk of the impact to a low-level threat. The risks were then reduced to low with the prescribed mitigation measures and therefore the recommended buffer was calculated to be 20m (Table 11 for the construction and operational phases).

**Table 11: Post-mitigation buffer requirement.**

Required Buffer after mitigation measures have been applied	
Construction Phase	20 m
Operational Phase	20 m

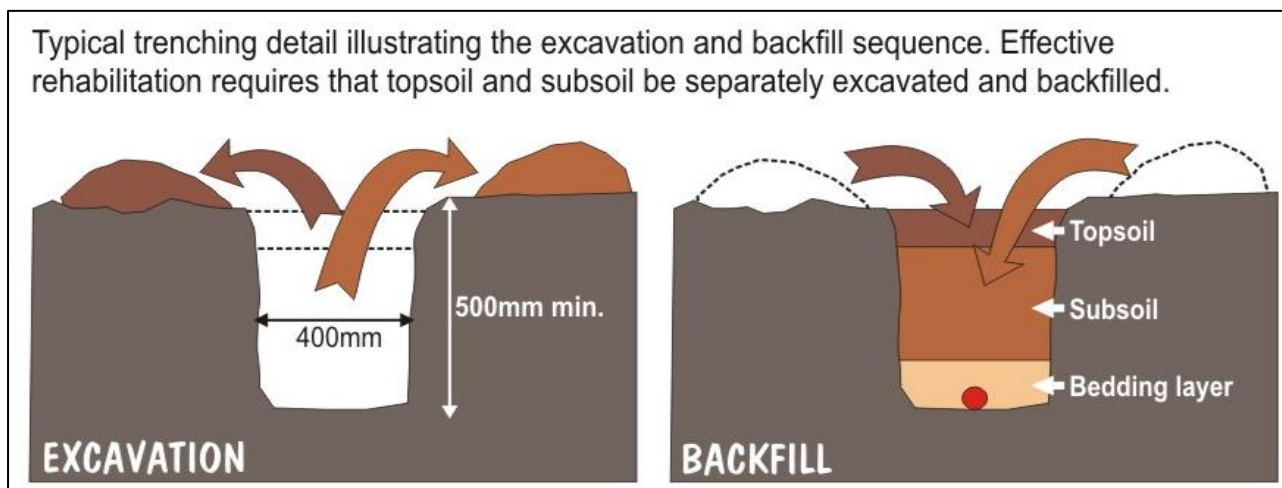
#### 2.3.4 Specialist Risk Assessment and Recommendations<sup>3</sup>

The specialist did not identify any moderately significant risks during construction, with all risks being low. The aspects considered for the construction phase pose an indirect risk to the systems, riparian and aquatic habitat, specifically considering the position of the pump station and the proximity to the systems. These indirect risks are unavoidable; however, they are short term because during the physical upgrade of the existing network and facilities there would typically be sewerage leakages and spillages anyway which would prove detrimental to the health of the water resource. It is the specialist’s opinion that leakages are unlikely to occur if the contractor takes appropriate precautionary measures and provided mitigations. As per the specialist report, the operational phase is where the risk lies, as the rising main will be transporting sewerage which has the potential to impact on the water resource significantly should there be a leak. The highest risk is therefore related to the potential burst/leaking of the rising main which would impact on the water resource (not during normal operation); this is rated as a moderate risk. The establishment of alien vegetation is also classified as a moderate risk based on the current impact that the alien vegetation is having on the water resources. These can be reduced to a low rating if the mitigation measures are followed. The rising main and pump station will be located within the 20m wetland buffer and 30m riparian buffer which cannot be avoided. However, the buffers must be implemented for all secondary activities such as laydown yards, storage areas and campsites.

The following recommendations have been proposed by the specialist:

- A soil management strategy must be compiled and implemented for the excavation and backfilling of trenches. A proposed soil handling sequence is presented in Figure 8 below.
- An infrastructure monitoring and service plan must be compiled and implemented during the operational phase.

<sup>5</sup> Macfarlane, D.M., Bredin, I.P., Adams, J.B., Zungu, M.M., Bate, G.C. and Dickens, C.W.S. 2014. Preliminary guideline for the determination of buffer zones for rivers, wetlands and estuaries. Final Consolidated Report. WRC Report No TT 610/14, Water Research Commission, Pretoria.

Figure 8: The Proposed Excavation and Back-Filling Handling of Soil<sup>6</sup>

## 2.4 Fauna and Flora

The following information has been obtained from the Northdale Sewage Pump Station and Rising Main System Upgrade, Ecological Assessment compiled by The Biodiversity Company (2020).

The specialist divided the fieldwork into three distinct areas to essentially increase sampling efficacy by maximising coverage in a relatively rapid manner:

- 1 – the footprint of the sewage development upgrade;
- 2 – the wetland adjacent to the development (excluding the northern forested edge) and
- 3 – the proximal CBA.

### 2.4.1 Flora

#### 2.3.1.1. Indigenous Flora<sup>7</sup>

Twenty-eight (28) species of indigenous flora were recorded within the assessment area. None were red-listed species. Two species recorded within the assessment area are protected under the legislation, namely *Podocarpus falcatus* – National Forest Act (Act No. 84 of 1998) and *Ledebouria petiolate* – KwaZulu-Natal Nature Conservation Ordinance (Ordinance 15 of 1974). Please note these species were not recorded within the development footprint (as per area 1 above), please see Table 12 below for all indigenous flora recorded.

Table 12: Summary Of Indigenous Floral Species Recorded Within The Assessment Area.

Species Name	Growth Form	Conservation Status
<i>Albizia adianthifolia</i>	Large tree	LC
<i>Aneilema aequinoctiale</i>	Herb	LC
<i>Apodytes dimidiata</i>	Large tree	LC
<i>Asystasia gangetica</i>	Herb	LC
<i>Bridelia micrantha</i>	Large tree	LC
<i>Canthium inerme</i>	Small tree	LC
<i>Celtis africana</i>	Tree	LC
<i>Cyperus albostratus</i>	Cyperoid	LC
<i>Cyperus compressus</i>	Cyperoid	LC
<i>Dalbergia obovata</i>	Woody scrambler	LC
<i>Desmodium incanum</i>	Herb	NE
<i>Diospyros dicrophylla</i>	Small tree	LC

<sup>6</sup> The Biodiversity Company (2020) Water Resource Assessment for the Proposed Northdale Sewage Pump Station – Appendix B

<sup>7</sup> The Biodiversity Company (2020) Northdale Sewage Pump Station and Rising Main System Upgrade, Ecological Assessment – Appendix B

Species Name	Growth Form	Conservation Status
<i>Dissotis canescens</i>	Herbaceous shrub	LC
<i>Ficus burkei</i>	Large tree	LC
<i>Hewittia malabarica</i>	Herbaceous climber	LC
<b><i>Ledebouria petiolata</i></b>	<b>Geophytic herb</b>	<b>LC</b>
<i>Leptochloa fusca</i>	Graminoid	LC
<i>Obetia tenax</i>	Herbaceous shrub	LC
<i>Oplismenus hirtellus</i>	Graminoid	LC
<i>Phragmites australis</i>	Megagraminoid	LC
<b><i>Podocarpus falcatus</i></b>	<b>Large tree</b>	<b>LC</b>
<i>Senecio deltoideus</i>	Herbaceous scrambler	LC
<i>Setaria megaphylla</i>	Graminoid	LC
<i>Thunbergia alata</i>	Herbaceous climber	LC
<i>Trema orientalis</i>	Large tree	LC
<i>Trichilia dregeana</i>	Large tree	LC
<i>Trichilia emetica</i>	Large tree	LC
<i>Typha capensis</i>	Cyperoid	LC

### 2.3.1.2. Invasive Alien Plants (IAP)<sup>8</sup>

Thirty (30) IAP species were recorded within the project area with seventeen (17) categorised as Category 1b and three (3) as Category 2. Therefore, these must be controlled by implementing an alien invasive plant management programme in compliance with section 75 of the National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEMBA). Please see Table 13 below for all IAPs recorded.

**Table 13: Summary Of Invasive Alien Plants (IAPs) Recorded**

Species Name	Growth Form	NEMBA Category
<i>Albizia lebbeck</i>	Large tree	1b
<i>Anredera cordifolia</i>	Succulent climber	1b
<i>Bauhinia variegata</i>	Large tree	1b
<i>Bidens pilosa</i>	Herb	-
<i>Canna indica</i>	Herb	1b
<i>Chromolaena odorata</i>	Herbaceous shrub	1b
<i>Colacasia esculenta</i>	Geophytic herb	-
<i>Eucalyptus grandis</i>	Large tree	1b
<i>Ipomoea purpurea</i>	Herbaceous climber	1b
<i>Jacaranda mimosifolia</i>	Large tree	1b
<i>Lantana camara</i>	Herbaceous shrub	1b
<i>Mangifera indica</i>	Large tree	-
<i>Melia azedarach</i>	Large tree	1b (3 in urban areas)
<i>Montanoa hibiscifolia</i>	Small tree	1b
<i>Morus alba</i>	Large tree	3
<i>Pennisetum clandestinum</i>	Graminoid	1b (only in protected areas or wetlands)
<i>Pennisetum purpureum</i>	Graminoid	2
<i>Pereskia aculeata</i>	Woody climber	1b
<i>Phytolacca diocoea</i>	Large tree	3

<sup>8</sup> The Biodiversity Company (2020) Northdale Sewage Pump Station and Rising Main System Upgrade, Ecological Assessment – Appendix B

Species Name	Growth Form	NEMBA Category
<i>Pinus patula</i>	Large tree	2
<i>Pistia stratiotes</i>	Aquatic macrophyte	1b
<i>Pontederia cordata</i>	Aquatic macrophyte	1b
<i>Ricinus communis</i>	Herbaceous shrub	2
<i>Rivina humilis</i>	Herb	1b
<i>Schinus terebinthifolius</i>	Large tree	1b
<i>Solanum mauritianum</i>	Small tree	1b
<i>Solanum seaforthianum</i>	Herbaceous climber	1b
<i>Spathodea campanulata</i>	Large tree	3
<i>Syzygium cumini</i>	Large tree	1b
<i>Tithonia diversifolia</i>	Herbaceous shrub	1b

## 2.4.2 Fauna

### 2.3.2.1. Herpetofauna<sup>9</sup>

Overall, herpetofauna species richness in the project area was considered depauperate, with no species being recorded during the survey based on either direct observation or the presence of visual tracks and signs.

### 2.3.2.2. Avifauna<sup>9</sup>

Avifauna species richness within the assessment was regarded as low as only 20 species were recorded in the project area during the survey, based on either direct observations or species calls. The relatively low species richness was attributed to the transformed landscape. Please see Table 14 below for all species recorded.

**Table 14: Summary Of Avifauna Species Recorded**

Scientific Name	Common Name	Conservation Status
<i>Acrocephalus baeticatus</i>	African Reed-warbler	LC
<i>Actophilornis africanus</i>	African Jacana	LC
<i>Amaurornis flavirostris</i>	Black Crake	LC
<i>Apus caffer</i>	White-rumped Swift	LC
<i>Ciconia episcopus</i>	Woolly-necked Stork	LC
<i>Colius striatus</i>	Speckled Mousebird	LC
<i>Dendropicus fuscescens</i>	Cardinal Woodpecker	LC
<i>Dicrurus adsimilis</i>	Fork-tailed Drongo	LC
<i>Estrilda astrild</i>	Common Waxbill	LC
<i>Halcyon albiventris</i>	Brown-hooded Kingfisher	LC
<i>Ploceus cucullatus</i>	Village Weaver	LC
<i>Ploceus ocularis</i>	Spectacled Weaver	LC
<i>Pogoniulus bilineatus</i>	Yellow-rumped Tinkerbird	LC
<i>Prinia subflava</i>	Tawny-flanked Prinia	LC
<i>Pycnonotus tricolor</i>	Dark-capped Bulbul	NE
<i>Riparia paludicola</i>	Brown-throated Martin	LC
<i>Spermestes cucullatus</i>	Bronze Mannikin	LC
<i>Trachyphonus vaillantii</i>	Crested Barbet	LC
<i>Turtur tympanistria</i>	Tambourine Dove	LC
<i>Zosterops virens</i>	Cape White-eye	LC

<sup>9</sup> The Biodiversity Company (2020) Northdale Sewage Pump Station and Rising Main System Upgrade, Ecological Assessment – Appendix B

### 2.3.2.3. Mammals<sup>10</sup>

Mammal diversity in the project area was considered low, with only a single mammal species being recorded during the survey based on either direct observation or the presence of visual tracks and signs. Please see Table 15 below for all species recorded. *Chlorocebus pygerythrus* (Vervet monkey) are protected under Schedule 3 of the KZNEBPA and appear in Appendix II of CITES.

**Table 15: Summary Of Mammal Species Recorded**

Scientific Name	Common Name	Conservation Status
<i>Chlorocebus pygerythrus</i>	Vervet Monkey	LC

### 2.4.3 Habitat Types and Habitat Sensitivity<sup>10</sup>

The habitat type delineated within the development footprint area can be described as a transformed area comprised of homesteads, secondary roads, servitudes and typically comprised of IAPs such as *Lantana camara*, *Anredera cordifolia*, *Solanum seafortianum* and *Melia azedarach*. As per the specialist, this habitat was regarded as not sensitive.

### 2.4.4 Specialist Risk Assessment and Recommendations<sup>10</sup>

As per the specialist report, impacts during construction and prior to the implementation of mitigation measures the significance of impact were rated as 'Moderately High' due to the proximal wetland habitat. However, the implementation of mitigation measures reduced the significance of the potential impact on the biodiversity community to a low rating. The significance of the displacement of fauna due to disturbance and/or direct mortalities was rated as 'Moderate' prior to the implementation of mitigation measures. During the operational phase, the impact significance of encroachment by alien invasive plant species and the introduction of pest species was rated as moderately high prior to mitigation. However, due to the implementation of mitigation measures the significance of these impacts has been reduced to an 'Absent' level. The impact of sewage spills into the wetland system if the pump station fails and/or pipe leaks was rated as 'Moderately High' prior to the implementation of mitigation measures but is reduced to a 'Low' impact level subsequent to the implementation of mitigation measures. The permanent degradation of the surrounding wetland habitat due to improper waste control was rated as a 'High' impact prior to the implementation of mitigation measures. This was reduced to a 'Low' impact level in consideration of the implementation of mitigation measures. The specialist concluded that in their opinion, the project is feasible. However, the impacts associated with the proposed development activities must be mitigated against to ensure the maintenance of ecological processes of nearby habitats.

<sup>10</sup> The Biodiversity Company (2020) Northdale Sewage Pump Station and Rising Main System Upgrade, Ecological Assessment – Appendix B



## 2.5 D'MOSS

The Durban Metropolitan Open Space System (D'MOSS) is associated with the tributary of the Tongati River, which serves as a biodiversity corridor area, please see Figure 9 below.

**Figure 9: D'MOSS map associated with the project.**



There will be some loss of D'MOSS, however, the significance of the impact on D'MOSS is deemed to be low due to the small area of the proposed development. In addition, the impact will occur on the edge of D'MOSS and as such the infrastructure will not block or cut off any corridors or prevent species movement within the D'MOSS area. The biodiversity specialist did not identify any flora or fauna of conservation significance in this area. Therefore, the project is not expected to have significant loss of area under D'MOSS provided the mitigation measures presented in this report and EMP are followed.

## 2.6 Geohydrological Investigations<sup>11</sup>

Geomeasure Group has undertaken a geohydrological investigation for the proposed Northdale sewer pipeline and pump station in the Maidstone area of KwaZulu-Natal Province. The site is underlain by shales of the Pietermaritzburg Formation. Typical borehole yields, which are to be expected in this area in these sediments, are considered to be moderate and in the range of > 0.5 l/s 3.0 l/s. The ambient groundwater quality in the Pietermaritzburg Formation shales is reportedly quite good, with electrical conductivity (EC) values of 18 mS/m with reported higher concentrations of iron, and sulphates.

A field hydrocensus identified three (3) potential boreholes and water sources in the area deemed geohydrologically sensitive by an on-site assessment, with the borehole not registered on the various available databases. A total of one (1) groundwater sample was taken from the above-mentioned borehole in the vicinity of the site. The water quality results returned indicated that the water is generally of poor quality with multiple physical properties, macro chemical and microbiological determinants exceeding the limits.

<sup>11</sup> Geomeasure (2020) Report On The Desktop Study And Geohydrological Investigation Undertaken For The Proposed Northdale Sewer Pipeline And Pump Station Maidstone KwaZulu Natal Province – Appendix B

A total of two (2) surface water samples were taken upstream and downstream of the site. The water quality results that were returned indicated that the surface water quality is generally moderate with selected macro and micro chemical determinants exceeding the limits. Whilst there are no limits for E.coli or total coliforms, the levels are significantly elevated. The point-pollution sources identified were the Tongaat Waste Water Treatment Works, a fuel retail service station, the Tongaat Hulett Sugar Mill, an animal feeds facility, a farm with diesel storage as well as a construction and sugar cane logistics facility.

The provided scoring system indicates that the risk from a leaking pipeline or pump station system is low and impacts can be further mitigated if the recommendations are adhered to.

The following recommendation has been proposed by the specialist:

- design of the infrastructure by a competent engineer
- construction of the facilities under the supervision of a competent engineer and through the use of competent contractors
- regular surface water monitoring (as recommended hereafter) to identify any impacts, so that they can be remediated as soon as practically possible
- Any leakage in the pipeline should be reported immediately and repaired as soon as possible, so to minimise any impacts.

## 2.7 Geotechnical Investigations<sup>12</sup>

Based on the 1:250 000 Geological Map titled "2930 Durban", at a regional scale, the site is seen to be underlain by shale with thin siltstones and sandstones of the Pietermaritzburg Formation, Ecca Group, Karoo Supergroup. However, at a local level, the site appeared to be underlain by transported colluvial and alluvial soils.

From the results of the geotechnical report, the site is suitable for the proposed development. However, the following recommendations must be implemented.

- All excavations exceeding 0.5 m should have proper sidewall protection and temporary lateral support to ensure safety for workers.
- Due to the depth of excavations planned for the structure, foundations should be placed at an average depth of 5.5m below the surface with an Estimated Allowable Bearing Capacity (EABC) of approximately 250 kPa. Placement of the foundations on the residual shale or highly weathered shale bedrock will negate any settlement of the structure.
- It is suggested that due to the nature of the excavation, the deep excavation sidewalls will require appropriate lateral support prior to pouring of concrete, possibly in the form of shoring and bracing, to final depths excavated due to the presence of water. It is recommended that a geotechnical professional be present on-site during the excavation process to ensure that on-site instructions can be issued for lateral support in order to limit the time that the excavations remain open.
- Due to the shallow groundwater table across the site, combined with the deep excavation and the light concrete shell to be constructed, buoyancy effects should be accounted for in the design process and during the construction of the pump station.
- Drainage should be such that any rainfall is diverted to the nearest stormwater drainage system. Areas of potential pooling or damming of rainfall on-site should be carefully designed and sloped so as to remove this water from the site.

## 2.8 Paleontological Environment

To comply with the South African Heritage Resources Agency (SAHRA) in terms of Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA), a desktop Palaeontological Impact Assessment (PIA) was completed for the proposed project.

The site lies on the shales of the Pietermaritzburg Formation (Ecca Group, Karoo Supergroup). These sediments only very rarely preserve fossil plant fragments that have been transported from the land and deposited. In the shoreline there are rare trace fossils of invertebrate burrows, but these have been microbioturbated<sup>13</sup> so their structures are unrecognisable. The much more fossiliferous shales of the Vryheid formation are not within the project footprint. According to the SAHRIS palaeosensitivity map the site is indicated

<sup>12</sup> GCS (2020) Geotechnical Investigation for the Proposed Northdale Pump Station in Fairbreeze, Tongaat, Kwa-Zulu Natal Province: Final Report – Appendix B

<sup>13</sup> Johnson, M.R., van Vuuren, C.J., Visser, J.N.J., Cole, D.I., Wickens, H.deV., Christie, A.D.M., Roberts, D.L., Brandl, G., 2006. Sedimentary rocks of the Karoo Supergroup. In: Johnson, M.R., Anhaeusser, C.R. and Thomas, R.J., (Eds). The Geology of South Africa. Geological Society of South Africa, Johannesburg / Council for Geoscience, Pretoria. Pp 461 – 499.

as moderately sensitive, however it is in a dully developed urban area so the soils have been disturbed. Soils do not preserve fossils because they are naturally weathered sediments that have been vegetated. Jurassic Dolerite dykes are volcanic in origin and do not preserve any fossils. They intruded through the Karoo Basin sediments at about the same time as the massive Drakensberg Basaltic outpourings, and destroyed any fossils in their immediate vicinity.

Based on experience and the lack of any previously recorded fossils from the area, it is very unlikely that any fossils would be preserved in the soils of the Pietermaritzburg Formation (Ecca Group Group). Since there is a small chance that fossil fragments could be found below the surface, only to be revealed once excavations begin, a Fossil Chance Find Protocol has been included in the EMPr.

## 2.9 Heritage and Cultural Aspects

No items of archaeological significance were noted within the immediate area of the site associated with the Northdale project. Construction workers will be cautioned to operate with care on the site and should any unidentified archaeologically, or culturally sensitive aspects be discovered on-site, construction activities are to stop immediately and the issue assessed and the authorities (AMAFA) notified if need be.

## 2.10 Socio-Economic Environment

This is a 'low to middle-income area'. The proposed pump station and rising main will improve sanitation to all in the area. The site of the pump station and route of the rising main does not directly impact any homestead. However, a Permission to Occupy has been signed and agreed between the applicant, eThekweni Municipality and the landowner, Tongaat Hulett. Special care will be taken during the construction of the road to avoid any hidden infrastructure. If there is a requirement to relocate any infrastructure, an agreement must be made with the contractor and the relevant stakeholder. Ultimately, the community, in general, will have improved sanitation and living conditions.

## 2.11 Surrounding Environment and Land Uses

The land uses surrounding the site are as follows:

- Located within an urban area.
- The houses within the area are fairly dense and form part of Maidstone.
- The land surrounding the pump station and rising main:
  - Open community sportsfield;
  - Subsistence urban farming
  - Delineated wetland; and
  - Road infrastructure.

## 2.12 Photographs

The following photographs (Figure 10) have been provided below to reflect the proposed site.

**Figure 10: Photographs of the Site.**



**(a)** View of the current pump dilapidated station; **(b)** Additional view of the current pump station.



**(c)** View of the pump station looking towards the location of the new rising main; **(d)** View of the public open space where the rising main will be located



**(e)** View of the overgrown disturbed site looking south west; **(f)** Additional view of the proposed pump station site looking west.



**(g)** View of the current Tongati River Tributary; **(h)** View of the proposed tie-in point to the existing rising main

### Section 3: Policy and Legislative Context

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

**Table 16: All identify legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments**

Legislation	Compliance of Activity
The Constitution of South Africa (No. 108 of 1996)	The Constitution cannot manage environmental resources as a standalone piece of legislation, hence additional legislation has been promulgated in order to manage the various spheres of both the social and natural environment. Each promulgated Act and associated Regulations are designed to focus on various industries or components of the environment to ensure that the objectives of the Constitution are effectively implemented and upheld on an on-going basis throughout the country. In terms of Section 24, the constitution gives every person the right to an environment that is not harmful to their health and wellbeing.
National Environmental Management Act (Act 107 of 1998)	<p>The National Environmental Management Act (Act 107 of 1998) (NEMA) is South Africa's overarching environmental legislation. It includes a set of principles that govern environmental management and against which all Environmental Management Programmes (EMPr) and actions are measured. These principles include and relate to sustainable development, protection of the natural environment, waste minimisation, public consultation, the right to an environment that is not harmful to one's health or wellbeing, and a general duty of care.</p> <p>The Environmental Impact Assessment (EIA) Regulations, 2014: GNR.982, R.983, and R.985 under Section 24 of the NEMA define the activities that require Environmental Authorisation and the processes to be followed to assess environmental impacts and obtain Environmental Authorisation.</p> <p>The proposed development triggers Activity 19 of Listing Notice 1 and Activity 14 of Listing Notice 3. The proposed development thus requires EA in the form of a BA process. The associated EMPr will include mitigation measures, recommended by specialists that are required to be implemented to ensure that environmental resources are protected.</p>
National Water Act (Act 36 of 1998)	<p>NWA states that a person may only use water if the water use is authorised by a license under NWA or if the responsible authority has dispensed with a license requirement if it is satisfied that the purpose of the NWA will be met by the granting of a license, permit or other authorisation under any other law.</p> <p>There will be alterations to the bed and banks of a watercourse. Therefore, a water use authorisation will be required as per Section 21 (c) and (i) of the National Water Act.</p>
National Environmental Management: Waste Act (Act 59 of 2008)	To reform the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development; to provide for institutional arrangements and planning matters; to provide for national norms and standards for regulating the management of waste by all spheres of government; to provide for specific waste management measures; to provide for the licensing and control of waste management activities; to provide for the remediation of contaminated land; to provide for the national waste information system; to provide for compliance and enforcement, and to provide for matters connected therewith. Section 19 allows the Minister to publish a list of activities, which require a Waste

	<p>Management License. The most recent list is published in Government Gazette 37083 Notice No. 921 dated 29 November 2013.</p> <p>It is unlikely that any activities carried out by the development will trigger a Waste Management Activity.</p>
National Environmental Management: Air Quality Act (Act 39 of 2004)	<p>To reform the law regulating air quality in order to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social development; to provide for national norms and standards regulating air quality monitoring, management and control by all spheres of government; for specific air quality measures; and for matters incidental thereto.</p> <p>It is unlikely that any activities carried out by the development will impact on the local and regional air quality.</p>
National Environmental Management: Protected Areas Act (Act 57 of 2003)	<p>The National Environmental Management: Protected Areas intends to provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes, for the establishment of a national register of all national, provincial and local protected areas, for the management of those areas in accordance with national norms and standards, for intergovernmental co-operation and public consultation in matters concerning protected areas, and for matters in connection therewith.</p> <p>The proposed development will not have an impact on any protected areas.</p>
National Environmental Management: Integrated Coastal Management Act (Act 24 of 2008)	<p>The National Environmental Management: Integrated Coastal Management Act aims to establish a system of integrated coastal and estuarine management in the Republic, including norms, standards and policies, in order to promote the conservation of the coastal environment, and maintain the natural attributes of coastal landscapes and seascapes, and to ensure that development and the use of natural resources within the coastal zone is socially and economically justifiable and ecologically sustainable, to define rights and duties in relation to coastal areas, to determine the responsibilities of organs of state in relation to coastal areas, to prohibit incineration at sea, to control dumping at sea, pollution in the coastal zone, inappropriate development of the coastal environment and other adverse effects on the coastal environment, to give effect to South Africa's international obligations in relation to coastal matters and to provide for matters connected therewith.</p> <p>The proposed development will not have an impact on any coastal areas.</p>
National Forest Act (Act 84 of 1998)	<p>To reform the law on forests as the government recognises that everyone has the constitutional right to have the environment protected for the benefit of present and future generations, natural forests and woodlands form an important part of that environment and need to be conserved and developed according to the principles of sustainable management, plantation forests play an important role in the economy; plantation forests have an impact on the environment and need to be managed appropriately, the State's role in forestry needs to change; and the economic, social and environmental benefits of forests have been distributed unfairly in the past.</p> <p>The proposed development will not have an impact on any forest areas.</p>
Environmental Conservation Act (Act 43 of 1996)	<p>This Act makes provisions for the application of general environmental principles for the protection of ecological processes, promotion of</p>

	sustainable development and the protection of the environment. This Act has mostly been repealed by NEMA.
National Environmental Management: Biodiversity Act (Act 10 of 2004)	<p>The National Environmental Management: Biodiversity Act intends, to provide for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998, the protection of species and ecosystems that warrant national protection, the sustainable use of indigenous biological resources, the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources, the establishment and functions of a South African National Biodiversity Institute and for matters connected therewith.</p> <p>The site is not located within a threatened ecosystem.</p>
National Heritage Resources Act (Act 25 of 1999)  KwaZulu-Natal Heritage Act (Act 4 of 2008)	<p>The National Heritage Act (No. 25 of 1999) aims to promote good management of the national estate in order to preserve the country's unique heritage for current and future generations. The KwaZulu-Natal Heritage Act (Act No. 4 of 2008) provides for the conservation and preservation of the physical and intangible heritage resources of the KwaZulu-Natal province.</p> <p>No significant archaeological artefacts will be disturbed during this project; therefore; no permits will be required from the provincial heritage authority, AMAFA.</p>
Mineral & Petroleum Resources Development (Act 28 of 2002)	<p>To provide for the sustainable development of the nation's mineral and petroleum resources which includes activities carried out for the winning of any mineral on, in or under the earth (i.e. the use of borrow pits).</p> <p>Mined material used to construct the pump station and rising main must be obtained from licensed sources.</p>
Occupational Health and Safety Act (Act 181 of 1993)	<p>These regulations provide for the health and safety of persons at work, including aspects which are hazardous to health and safety. In terms of major hazardous installation, the regulations shall apply to employers, self-employed persons and users, who have on their premises, either permanently or temporarily, a major hazard installation or a quantity of a substance which may pose a risk that could affect the health and safety of employees and the public.</p> <p>During both the construction phase of this development all the requirements of Occupational Health and Safety Act 1993 will need to be adhered to.</p>
Hazardous Substances Act (Act No. 15 of 1973)	<p>This Act aims to provide for the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure thereby in certain circumstances, and for the control of certain electronic products, to provide for the division of such substances or products into groups in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of such substances and products and to provide for matters connected therewith.</p> <p>A Spill Contingency Plan will be compiled for managing spills during the construction of the proposed Development.</p>
National Building Regulations and Building Standards Act (Act 103 of 1977)	This Act aims to provide for the promotion of uniformity in the law relating to the erection of buildings in the areas of jurisdiction of local authorities and for the prescribing of building standards.
Guideline on Need and Desirability (2017)	Guideline considered determining the need and desirability of proposed development.
<b>Municipal Planning Framework</b>	

eThekweni Municipality Integrated Development Plan.	<p>Chapter 3: The Eight Point Plan, Programme 3.11: Infrastructure Asset Management, states:</p> <p><i>'The goal of Infrastructure Asset Management is to meet a required level of service, in the most cost-effective manner, through the management of assets for present and future generations. National Government has legislated the need for local government to formulate Asset Management Programmes in all sectors. An Integrated Infrastructure Asset Management Plan is being established that will, in the first instance, involve the management of the following strategic assets: Electricity, Water and Sanitation, Roads, Transport, Parks and Leisure, Storm Water, Solid Waste and Property and Buildings.'</i></p> <p>Therefore, this project falls in line with the eThekweni Municipality's goals to improve all water and sanitation infrastructure.</p>
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## Section 4: Motivation, Need and Desirability

### 4.1 Need and Desirability as Per Section 3(F)

The following table has been prepared as per the 2017 Integrated Environmental Management Guideline: Guideline on Need and Desirability compiled by the Department of Environmental Affairs.

**Table 17: Need and Desirability as per the 2017 Guideline on Need and Desirability**

<b>“securing ecological sustainable development and use of natural resources”</b>	
<i>How will this development (and its separate elements/aspects) impact on the ecological integrity of the area?</i>	The impact on the ecological integrity of the area has been rated as low during the construction phase. In terms of water resources these risks relate to sewerage leakages and spillages. In terms of terrestrial biodiversity risk displacement of fauna due to disturbance and/or direct mortalities is the leading factor. There is very little impact anticipated during the operational phase. The greatest impact identified relates to potential sewage spillage as a result of damage to the pump station and rising main. These impacts, however, are unlikely if all mitigation measures identified in this report and EMPr are implemented.
<i>How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity? What measures were explored to firstly avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?</i>	The proposal will result in the infill of 22m <sup>3</sup> of material within the wetland. Alternatives investigated included refurbishment of the existing infrastructure; however, this was not feasible from a cost and engineering perspective please refer to Section 4.2.2. Alternate locations for placement of the new pump station and rising main were investigated but however no other feasible alternative could be identified, please refer to Section 4.2.1.  The proposal will however improve the current situation which is resulting in the spillage of raw sewage into the environment due to blockages occurring in aging infrastructure. The impacts associated with the proposed development are unavoidable, however looking at the greater scheme of things the new infrastructure will improve the current status of the local environment.
<i>How will this development pollute and/or degrade the biophysical environment? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?</i>	Apart from construction impacts, the development will not pollute and/or degrade the biophysical environment as the pump station and rising main are both closed systems. The proposed project will in fact rectify an existing situation whereby sewage is contaminating the environment as a result of blockages occurring in ageing infrastructure.
<i>What waste will be generated by this development? What measures were explored to firstly avoid waste, and where waste could not be avoided altogether, what measures were explored to minimise, reuse and/or recycle the waste? What measures have been explored to safely treat and/or dispose of unavoidable waste?</i>	General waste and a small amount of hazardous waste such as oil spills will be generated during construction. No waste will be generated during operation. An EMPr has been provided to ensure waste is sufficiently managed on-site.
<i>How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?</i>	There are no negative or positive impacts on any cultural heritage sites.
<i>How will this development use and/or impact on non-renewable natural resources? What measures were explored to ensure responsible and equitable use of the resources? How have the consequences of the depletion of the non-renewable natural resources been considered? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to</i>	Apart from construction materials, there will be no other non-renewable natural resources will be used on site.

<p><i>minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?</i></p>	
<p><i>How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part? Will the use of the resources and/or impact on the ecosystem jeopardise the integrity of the resource and/or system taking into account carrying capacity restrictions, limits of acceptable change, and thresholds? What measures were explored to firstly avoid the use of resources, or if avoidance is not possible, to minimise the use of resources? What measures were taken to ensure responsible and equitable use of the resources? What measures were explored to enhance positive impacts?</i></p> <ul style="list-style-type: none"> <li>• <i>Does the proposed development exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e. dematerialised growth)? (note: sustainability requires that settlements reduce their ecological footprint by using less material and energy demands and reduce the amount of waste they generate, without compromising their quest to improve their quality of life)</i></li> <li>• <i>Does the proposed use of natural resources constitute the best use thereof? Is the use justifiable when considering intra- and intergenerational equity, and are there more important priorities for which the resources should be used (i.e. what are the opportunity costs of using these resources this the proposed development alternative?)</i></li> <li>• <i>Do the proposed location, type and scale of development promote a reduced dependency on resources</i></li> </ul>	<p>The development is not expected to impact on renewable natural resources.</p>
<p><i>How were a risk-averse and cautious approach applied in terms of ecological impacts?</i></p> <ul style="list-style-type: none"> <li>• <i>What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)</i></li> <li>• <i>What is the level of risk associated with the limits of current knowledge</i></li> <li>• <i>Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?</i></li> </ul>	<p>During the construction phase, the impact on the ecological integrity of the area has been rated as low. During operation, there is very little impact. The greatest impact identified relates to potential sewage spillage. This, however, is unlikely if all mitigation measures identified in this report and EMPr are implemented. When looking at macro scale site alternatives, no other alternatives have been considered as the site is already fed by existing infrastructure, therefore relocating the pump station to a completely new location would require re-routing of all sewer infrastructure on a regional scale. This would not be feasible from an economic and environmental perspective.</p>
<p><i>How will the ecological impacts resulting from this development impact on people's environmental right in terms following</i></p> <ul style="list-style-type: none"> <li>• <i>Negative impacts: e.g. access to resources, opportunity costs, loss of amenity (e.g. open space), air and water quality impacts, nuisance (noise, odour, etc.), health impacts, visual impacts, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?</i></li> <li>• <i>Positive impacts: e.g. improved access to resources, improved amenity, improved air or water quality, etc. What measures were taken to enhance positive impacts?</i></li> </ul>	<p>The proposed development will address a situation that is currently negatively impacting on people's environmental rights. The proposal will ensure that raw sewage spillages will no longer take place.</p>
<p><i>Describe the linkages and dependencies between human wellbeing, livelihoods and ecosystem services</i></p>	<p>The project area is a formal residential area whereby the pump station will pump raw sewage to the wastewater treatments</p>

<p>applicable to the area in question and how the development's ecological impacts will result in socio-economic impacts (e.g. on livelihoods, loss of heritage site, opportunity costs, etc.)?</p>	<p>works to ensure that waterborne sewage functions in the area. This will aid in providing good sanitation services which ultimately improve people's health and well-being. The current system is old and dilapidated and such is continually failing leading to raw sewage spillages in the environment which is impacting on the water quality, negatively affecting the natural environment and putting people's health at risk and affecting their sense of well-being. By addressing this situation these current impacts will be mitigated.</p>
<p>Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives/targets/considerations of the area?</p>	<p>The development should have no significant negative impact on ecological integrity based on the understanding that the pump station will be operated as per the conditions of the EMPr. In fact, there will be a positive environmental impact which is related to the prevention of raw sewage spillages.</p>
<p>Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the "best practicable environmental option" in terms of ecological considerations?</p>	<p>Due to the nature of the development, no other feasible site alternatives could be considered, please refer to Section 1.3 and 4.2. In terms of technology alternatives, the preferred alternative results in a much lower level of impact due to the existing sewer infrastructure remaining functional during the construction period. Technology Alternative 1 would need the construction of a temporary capture system.</p>
<p>Describe the positive and negative cumulative ecological/biophysical impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and existing and other planned developments in the area?</p>	<p>As a pump station and sewer reticulation are already in place the proposed development will not result in any further negative cumulative impacts. In fact It will result in a positive cumulative impact which is improving downstream water quality due to the cessation of raw sewage spillages.</p>
<b>"promoting justifiable economic and social development"</b>	
<p>What is the socio-economic context of the area, based on, amongst other considerations, the following considerations:</p> <ul style="list-style-type: none"> <li>• The IDP (and its sector plans' vision, objectives, strategies, indicators and targets) and any other strategic plans, frameworks of policies applicable to the area,</li> <li>• Spatial priorities and desired spatial patterns (e.g. need for integrated of segregated communities, need to upgrade informal settlements, need for densification, etc.),</li> <li>• Spatial characteristics (e.g. existing land uses, planned land uses, cultural landscapes, etc.), and</li> <li>• Municipal Economic Development Strategy ("LED Strategy").</li> </ul>	<p>The land uses surrounding the site are as follows:</p> <ul style="list-style-type: none"> <li>• Located within a low to middle-income urban area.</li> <li>• The houses within the area are fairly dense and form part of Maidstone.</li> <li>• The land surrounding the pump station and rising main: <ul style="list-style-type: none"> <li>○ Open community sports field;</li> <li>○ Subsistence urban farming</li> <li>○ Delineated wetland; and</li> <li>○ Road infrastructure.</li> </ul> </li> </ul>
<p>Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate elements/aspects), and specifically also on the socio-economic objectives of the area?</p>	<p>The construction of the new sewer pump station and rising main will have both a positive socio-economic and environmental impact. Due to continual blockages of the existing sewer infrastructure, spillages of raw sewage into the environment are frequent. This is not only detrimental to the local biophysical environmental but also creates a health and nuisance impact for all residents. The proposed sewer pump station and rising main will ultimately improve sanitation services in the area and ensure better protection of the local receiving environment.</p>
<p>How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?</p>	<p>The new sewer infrastructure will aid in improving sanitation for the community of Maidstone and surroundings.</p>
<p>Will the development result inequitable (intra- and inter-generational) impact distribution, in the short- and long-term?</p>	<p>As the proposed development is a municipal sanitation project it will benefit the public in general and will not result in inequitable (intra- and inter-generational) impact distribution.</p>
<p>Will the impact be socially and economically sustainable in the short- and long-term?</p>	<p>Yes, the development will be socially and economically sustainable as there have not been any significant socio-economic impacts identified. The pump station and rising main will have a positive long-term social impact on all residents in the Maidstone area.</p>

<p><i>In terms of location, describe how the placement of the proposed development will:</i></p> <ul style="list-style-type: none"> <li>• <i>result in the creation of residential and employment opportunities in close proximity to or integrated with each other,</i></li> <li>• <i>reduce the need for transport of people and goods,</i></li> <li>• <i>result in access to public transport or enable non-motorised and pedestrian transport (e.g. will the development result in densification and the achievement of thresholds in terms public transport),</i></li> <li>• <i>compliment other uses in the area,</i></li> <li>• <i>be in line with the planning for the area,</i></li> <li>• <i>for urban related development, make use of underutilised land available with the urban edge,</i></li> <li>• <i>optimise the use of existing resources and infrastructure,</i></li> <li>• <i>opportunity costs in terms of bulk infrastructure expansions in non-priority areas (e.g. not aligned with the bulk infrastructure planning for the settlement that reflects the spatial reconstruction priorities of the settlement),</i></li> <li>• <i>discourage "urban sprawl" and contribute to compaction/densification,</i> <ul style="list-style-type: none"> <li>▪ <i>contribute to the correction of the historically distorted spatial patterns of settlements and to the optimum use of existing infrastructure in excess of current needs,</i></li> <li>▪ <i>encourage environmentally sustainable land development practices and processes,</i></li> <li>▪ <i>take into account special locational factors that might favour the specific location (e.g. the location of a strategic mineral resource, access to the port, access to rail, etc.),</i></li> <li>▪ <i>the investment in the settlement or area in question will generate the highest socio-economic returns (i.e. an area with high economic potential),</i></li> <li>▪ <i>impact on the sense of history, sense of place and heritage of the area and the socio-cultural and</i></li> <li>▪ <i>cultural-historic characteristics and sensitivities of the area, and</i></li> <li>▪ <i>in terms of the nature, scale and location of the development promote or act as a catalyst to create a more integrated settlement?</i></li> </ul> </li> </ul>	<p>Apart from the temporary employment opportunities during construction and improved living conditions due to all raw sewage spillages being stopped, there are no other identified negative or positive social impacts. The proposal is therefore in line with planning for the area. The proposal is thus suitable as well as necessary at this location. Please note this project is the replacement of existing infrastructure although not on the exact footprint and such there numerous existing impacts in the project area.</p>
<p><i>How were a risk-averse and cautious approach applied in terms of socio-economic impacts?:</i></p> <ul style="list-style-type: none"> <li>• <i>What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?</i></li> <li>• <i>What is the level of risk (note: related to inequality, social fabric, livelihoods, vulnerable communities, critical resources, economic vulnerability and sustainability) associated with the limits of current knowledge?</i></li> <li>• <i>Based on the limits of knowledge and the level of risk, how and to what extent was a</i></li> </ul>	<p>The project is the replacement of existing infrastructure. This existing infrastructure is severely damaged and is resulting in continuous raw sewage spillages into the environment which ultimately impacts the well-being of the local community. The only feasible alternative to alleviate the socio-economic impacts is to undertake the proposed works. Apart from minor nuisance impacts during construction there are no identified negative impacts associated with the operation of the pump station and rising main and such a risk-averse and cautious approach was not required with regards to socio-economic impacts.</p>

<p><i>risk-averse and cautious approach applied to the development?</i></p>	
<p><i>How will the socio-economic impacts resulting from this development impact on people's environmental right in terms following</i></p> <ul style="list-style-type: none"> <li>• <i>Negative impacts: e.g. health (e.g. HIV-Aids), safety, social ills, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?</i></li> <li>• <i>Positive impacts. What measures were taken to enhance positive impacts?</i></li> </ul>	<p>The proposed development will not negatively impact on people's environmental rights. In fact, the development will have a positive impact, as raw sewage spillages will no longer take place, these spillages currently negatively impact on the community's environmental rights.</p>
<p><i>Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socio-economic impacts will result in ecological impacts (e.g. over utilisation of natural resources, etc.)?</i></p>	<p>The proposal will improve sanitation and also prevent spillage of raw sewage into the environment thereby protecting the nearby wetland and natural systems from ongoing contamination and improving people's health thereby supporting human wellbeing and human interdependencies on existing natural systems.</p>
<p><i>What measures were taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations?</i></p>	<p>Due to the nature of the development, no other feasible site alternatives could be considered, please refer to Section 4.2.1. In terms of technology alternatives, the preferred alternative results in a much lower level of impact due to the existing sewer infrastructure remaining functional during the construction period. Technology Alternative 1 would need the construction of a temporary capture system, please refer to Section 4.2.2.</p>
<p><i>What measures were taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons (who are the beneficiaries and is the development located appropriately)?</i></p>	<p>There have been no identified impacts which will adversely impact on vulnerable and/or disadvantaged persons. The project addresses a situation whereby the community of Maidstone are suffering due to a poorly functioning sanitation system</p>
<p><i>Considering the need for social equity and justice, do the alternatives identified, allow the "best practicable environmental option" to be selected, or is there a need for other alternatives to be considered?</i></p>	<p>Yes, the best practicable environmental option is selected.</p>
<p><i>What measures were taken to pursue equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing, and what special measures were taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination?</i></p>	<p>The development will not impact on anyone's access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing. It will, in fact, improve sanitation in the area.</p>
<p><i>What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development's life cycle?</i></p>	<p>The EMPr includes conditions which have been developed to manage operational impacts. Upon receipt of the EA the EMPr will become legally binding. Therefore, the Municipality will be bound the conditions of the EMPr throughout the life cycle of the pump station and rising main.</p>
<p><i>What measures were taken to:</i></p> <ul style="list-style-type: none"> <li>• <i>ensure the participation of all interested and affected parties,</i></li> <li>• <i>provide all people with an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation,</i></li> <li>• <i>ensure participation by vulnerable and disadvantaged persons,</i></li> <li>• <i>promote community wellbeing and empowerment through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means,</i></li> <li>• <i>ensure openness and transparency, and access to information in terms of the process,</i></li> </ul>	<p>The following steps were followed during the public participation process.</p> <ul style="list-style-type: none"> <li>• The Ward Councilor was notified and a meeting was held on the 06<sup>th</sup> June 2022.</li> <li>• The Ward Councilor was provided with information, which included details about the proposed project.</li> <li>• A noticeboard detailing the proposed development was erected on the site on the 06<sup>th</sup> June 2022.</li> <li>• Notices were also handed out to adjacent residents on the 06<sup>th</sup> June 2022. Emails were sent out on the 7<sup>th</sup> June 2022 to all remaining adjacent landowners.</li> <li>• Landowner consent has been given together with a Permission to Occupy which has been signed between Tongaat Hulett and the eThekweni Municipality.</li> </ul>

<ul style="list-style-type: none"> <li>ensure that the interests, needs and values of all interested and affected parties were taken into account, and that adequate recognition were given to all forms of knowledge, including traditional and ordinary knowledge</li> <li>ensure that the vital role of women and youth in environmental management and development were recognised and their full participation therein were be promoted?</li> </ul>	<ul style="list-style-type: none"> <li>Two adverts were placed in the Rising Sun and the Metro Ezasegagasini Newspapers on 09<sup>th</sup> June 2022 and 10<sup>th</sup> June 2022 respectively.</li> <li>With regards to authority communications and other stakeholders, all relevant authorities have been notified of the application and have been provided with copies of this BAR.</li> </ul>
<p>Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community (e.g.. a mixture of low-, middle- and high-income housing opportunities) that is consistent with the priority needs of the local area (or that is proportional to the needs of an area)?</p>	<p>As the proposed development is a municipal sanitation project it will benefit the public in general and will not result in inequitable impact distribution.</p>
<p>What measures have been taken to ensure that current and/or future workers will be informed of work that potentially might be harmful to human health or the environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected?</p>	<p>During construction and operation, a full health, safety and environmental induction will be conducted on all employees. This induction brings to the attention of the employees all potential human health hazards and environmental dangers associated with the workings of the site. Inductions also indicate that all employees have a right to work in a clean and safe environment.</p>
<p>Describe how the development will impact on job creation in terms of, amongst other aspects:</p> <ul style="list-style-type: none"> <li>the number of temporary versus permanent jobs that will be created,</li> <li>whether the labour available in the area will be able to take up the job opportunities (i.e. do the required skills match the skills available in the area),</li> <li>the distance from where labourers will have to travel,</li> <li>the location of jobs opportunities versus the location of impacts (i.e. equitable distribution of costs and benefits), and</li> <li>the opportunity costs in terms of job creation (e.g. a mine might create 100 jobs, but impact on 1000 agricultural jobs, etc.).</li> </ul>	<p>There will be the provision of temporary jobs during construction. However, the sewer infrastructure is already in place so there will not be any jobs created during the operational phase.</p>
<p>What measures were taken to ensure:</p> <ul style="list-style-type: none"> <li>that there were intergovernmental coordination and harmonisation of policies, legislation and actions relating to the environment, and</li> <li>that actual or potential conflicts of interest between organs of state were resolved through conflict resolution procedures?</li> </ul>	<p>The proposed project falls under the jurisdiction of eThekweni Municipality's Water and Sanitation Department and as such there was no inter-governmental coordination required.</p>
<p>What measures were taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the public interest, and that the environment will be protected as the people's common heritage?</p>	<p>The proposed development is to take place on privately owned land, however, it will not negatively impact on people's common heritage with respect to the environment.</p>
<p>Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left?</p>	<p>All of the mitigations proposed by the EAP and specialists are realistic and practical and based on experience with other sanitation projects of this nature.</p>
<p>What measures were taken to ensure that the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects will be paid for by those responsible for harming the environment?</p>	<p>The EMPr will designate responsibility for all conditions. This document will be legally binding and as such any non-compliances with the conditions of the EMPr will effectively be breaking the law, therefore, the eThekweni Municipality will prioritise these items.</p>
<p>Considering the need to secure ecological integrity and a healthy bio-physical environment, describe how the</p>	<p>Due to the nature of the development, no other feasible site alternatives could be considered, please refer to Section 1.3</p>

<i>alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the best practicable environmental option in terms of socio-economic considerations?</i>	and 4.2. In terms of technology alternatives, the preferred alternative results in a much lower level of impacts due to the existing sewer infrastructure remaining functional during the construction period. Technology Alternative 1 would need the construction of a temporary capture system.
<i>Describe the positive and negative cumulative socio-economic impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and other planned developments in the area?</i>	As a pump station and sewer reticulation are already in place the proposed development will not result in any further negative or positive cumulative impacts.

## 4.2 The Motivation for Preferred Site, Activity and Technology Alternative

### 4.2.1 Preferred Site Alternative

#### Alternative 1 (Preferred Alternative)

The project entails the construction of a new pump station and rising main. When looking at macro scale site alternatives no other alternatives are feasible as the existing infrastructure already routes to this site and re-locating the pump station anywhere other than the site proposed would require re-routing of significant sewer infrastructure at a regional scale. This would not be feasible from either an economic or environmental perspective.

When looking at site alternatives at a micro-scale perspective, placing the pump station either further south or east. The existing bulk sewer pipeline feeding the pump station is gravity fed and locating the new pump station upgradient would not be feasible from an economic point of view as the feeder bulk sewer line would then need to be re-routed, which would incur additional costs. Siting the new pump station upgradient from the incoming sewer tie-in point is also not feasible from an engineering perspective as the drainage of sewage would be hindered (see Figure 5 showing gradients of the site). In addition, the proposed pump station could not be located in the area north of the existing pump station due to space constraints (see Figure 6). The distance between the current pump station and the edge of the waterbody associated with the wetland is approximately 13m. This distance is too small to maintain a safe working distance between the new infrastructure and the existing infrastructure which will remain functioning during the duration of construction. Therefore, the only feasible site alternative from a micro-scale perspective is to situate the site west of the existing pump station at the preferred location. Please note the land on which the project is being proposed is all privately owned and therefore the proposed location is dependent on the landowner's consent.

In terms of the rising main site alternative, no other routes that would satisfy the engineering requirements were deemed possible.

### 4.2.2 Preferred Technology Alternative

The preferred technology alternative is to construct a new modern sewer pump station and rising main, this would replace the existing infrastructure in place. This preferred alternative has been selected based on both environmental and socio-economic consideration.

- Alternative 1 would require refurbishing the existing pump station and sewer pipelines. This would require the existing facilities to be temporarily decommissioned to allow the refurbishment. Therefore, the Municipality would have to cater for the sewage inflow which would continue. In terms of the pump station, a temporary conservancy tank would need to be constructed downstream from the pump station to allow for capturing of all sewage. For the pipeline, temporary detour pipes would need to be constructed to allow the full refurbishment of the permanent pipeline.
- Alternative 1 would require a construction footprint much similar to the preferred alternative and so the biophysical impacts would be very similar. However, due to the nature of a conservancy tank i.e. requiring continuous emptying, there is a potential for the conservancy tank to overflow as the sewage inflow would be continuous. Any spillages from the conservancy tanks would result in raw sewage entering directly into the delineated wetland. The potential for this to happen is low however if a spillage were to take place the risk rating would be high. For this reason, from an environmental perspective constructing a new pump station and decommissioning the existing one is the preferred option.
- Alternative 1 would also require a substantially larger financial budget. Refurbishment of existing facilities although is often preferred as construction footprint is small, do however often require a larger budget as refurbishments are usually more labour intensive and specialised. New builds are simpler and quicker to complete. In addition, conservancy tanks are quick to build, however the running costs are very high due to the transportation requirements as all sewage has to be pumped out and transported to the nearest wastewater treatment works.

Therefore, the refurbishment as per Alternative 1 would not only result in a higher risk to the local biophysical environment but will also be a much higher financial burden for the Municipality.

## Section 5: Public Participation

### 5.1 Notification of Interested and Affected Parties

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

A noticeboard (isiZulu and English) was placed on-site on the 06<sup>th</sup> June 2022. The noticeboard detailed the eThekweni Municipality's proposed plan to construct the Northdale pump station and rising main, subject to a basic assessment. See Appendix C – Proof of Placement of Notice Board.

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

The following steps were followed during the public participation process.

- The Ward Councilor was notified and a meeting was held on the 06<sup>th</sup> June 2022.
- The Ward Councilor was provided with information, which included details about the proposed project.
- A noticeboard detailing the proposed development was erected on the site on the 06<sup>th</sup> June 2022.
- Notices were also handed out to adjacent residents on the 06<sup>th</sup> June 2022. Emails were sent out on the 7<sup>th</sup> June 2022 to all remaining adjacent landowners.
- Landowner consent has been given together with a Permission to Occupy which has been signed between Tongaat Hulett and the eThekweni Municipality.
- Two adverts were placed in the Rising Sun and the Metro Ezasegagasini Newspapers on 09<sup>th</sup> June 2022 and 10<sup>th</sup> June 2022 respectively.
- With regards to authority communications and other stakeholders, all relevant authorities have been notified of the application and have been provided with copies of this BAR.

See Appendix D – Proof of Notification.

- i. *owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;*

Email notifications to all I&APs were sent out on the 07<sup>th</sup> June 2022. See Appendix D – Proof of Notification.

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

English and IsiZulu adverts were placed in the Rising Sun and the Metro Ezasegagasini Newspapers on the 09<sup>th</sup> June 2022 and 10<sup>th</sup> June 2022 respectively. All adverts detailed the proposed project, Basic Assessment and to provide contact details of EnviroPro should anyone wish to register as an I&AP. See Appendix E – Proof of Advert Placement.



## 5.2 Registered Interested and Affected Parties

42. A proponent or applicant must ensure the opening and maintenance of a register of interested and affected parties and submit such a register to the competent authority, which register must contain the names, contact details and addresses of-
- (a) all persons who, as a consequence of the public participation process conducted in respect of that application, have submitted written comments or attended meetings with the proponent, applicant or EAP;
  - (b) all persons who have requested the proponent or applicant, in writing, for their names to be placed on the register; and
  - (c) all organs of state which have jurisdiction in respect of the activity to which the application relates.

The contact details of all I&APs that have registered have been provided in the Registered I&AP list in Appendix F.

## 5.3 Comments

Comments of interested and affected parties to be recorded in reports and plans 44.

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

All comments received from I&APs have been recorded in the comments and response table. This report has been provided to the eThekweni Municipality for comment. See Appendix G – Comments and Response table and Comments Received.

## Section 6: Impact Assessment

### 6.1 Methodology to Determine and Rank Significance and Consequences of Impacts Associated With All Alternative as Per Section 3(h) (vi)

Impacts are assessed qualitatively and quantitatively, looking at the duration/frequency of the activity and likely impacts associated with that activity during both construction and operation. If the activity happens frequently, the risk of the associated impact occurring is much higher than if the activity happens less frequently. The geographical extent of the impact is assessed i.e. will the impact be restricted to the point of occurrence or will it have a local or regional effect. Impacts are also reviewed looking at severity levels and consequences, should the impact occur i.e. will the severity be low, medium or high and then the probability of the impact occurring is taken into account.

Whether or not the impact can be mitigated and the extent to which it can be avoided, managed, mitigated, or reversed is assessed i.e. the probability of occurrence after mitigation has been applied. This also takes into account likelihood of human error based on construction and operational auditing experience i.e. even though spills can be completely mitigated against and prevented, there is always a small chance that spills will still occur (residual risk). Based on all of these factors, the impact is then rated to determine its significance. For example, an impact can have a regional effect with severe environmental implications, however, the probability of it occurring is very low, and the implementation of the proposed mitigation measures means that the ultimate rating is medium or low.

Please see below a description of the scoring. The full impact scoring tables detailing how the significance rating was calculated can be found in Appendix H.

Scoring of Impacts	
Duration / Frequency of activity likely to cause impact	0 = No impact 1 = short term / once off 2 = medium term / during operation 3 = long term / permanent
Geographical Extent	0 = No impact 1 = point of impact / restricted to site 2 = local / surrounding area 3 = regional
Severity (level of damage caused) if impact were to occur	0 = No impact 1 = minor 3 = medium 5 = major
Probability of impact without mitigation	1 - 5 = low. 6 -10 = medium. 11 -14 = high.
Significance before application of Mitigation Measures	A score of between 1 and 5 is rated as low. A score of between 6 and 10 is rated as medium. A score of between 11 and 14 is rated as high.
Will activity cause irreplaceable loss of resources?	10 = Yes 0 = No
Mitigation measures	0 = No impact - 5 = can be fully mitigated - 3 = can be partially mitigated -1 = unable to be mitigated
Probability of impact after mitigation	0 = No impact 1 = Low 2 = Medium 3 = High
Significance after application of Mitigation Measures	A score of between 1 and 5 is rated as low. A score of between 6 and 10 is rated as medium. A score of between 11 and 14 is rated as high.

## 6.2 Impact Assessment of the Route and Technology Alternatives

**Table 18: Specific Impacts Associated with Site and Technology Alternative 1 (Preferred Alternatives)**

See Appendix H for the full impacts scoring matrix, which assesses the impacts on the below identified sensitive environmental aspects. The specific activities and associated impacts identified in 18 below are site-specific and relate to the Preferred site and Technology Alternatives.

No.	Nature and Consequences of impact	Sig. rating of impacts <sup>14</sup> :	Proposed mitigation and Extent to which impact can be reversed/avoided, managed or mitigated:	Sig. rating of impacts after mitigation:
<b>Construction</b>				
<b>Direct Impacts</b>				
1.	<p><i>Activity:</i> Clearing of vegetation</p> <p><i>Impact:</i> Resulting in erosion in and around the Northdale construction footprint causing sedimentation within the delineated wetland a riparian area and the associated buffers thereby decreasing functionality.</p>	8 (Medium)	<p>The following measures must be carried out to mitigate against erosion on the site:</p> <ul style="list-style-type: none"> <li>The footprint area of the pipeline must be kept to a minimum. The footprint area must be demarcated to avoid unnecessary disturbances to adjacent areas.</li> <li>The areas outside the construction footprint must be demarcated as 'no-go' areas. The 20m wetland and 30m riparian buffers must be strictly adhered to.</li> <li>Areas exposed to erosion must be protected through the use of sandbags, berms and efficient construction processes i.e.: limiting the extent (footprint) and duration period that areas are exposed.</li> <li>The area between the excavation and HGM 1 must be bermed off to prevent any sedimentation contamination from entering the water resource.</li> <li>No excavated material or fill material may be stored within the 20m wetland and 30m riparian buffers.</li> <li>During the excavation of trenches, flows should be diverted around active work areas where required. Water diversion must be temporary and re-directed flow must not be diverted towards any stream banks that could cause erosion.</li> </ul>	5 (Low)
2.	<p><i>Activity:</i> Operation of vehicles and machinery around the construction site</p> <p><i>Impacts:</i> Damage to the delineated wetland and riparian area which will decrease biodiversity and functionality.</p>	8 (Medium)	<p>The following measures must be carried out to mitigate against careless damage to the surrounding habitats:</p> <ul style="list-style-type: none"> <li>All areas outside the construction footprint must be demarcated as no-go areas;</li> <li>Heavy vehicles are not permitted in the 20m wetland and 30m riparian buffers unless required for construction activities.</li> <li>The recommended buffers must also be imposed for all other construction activities.</li> </ul>	4 (Low)
3.	<p><i>Activity:</i> Construction disturbances i.e. noise, dust and vibration associated with the Northdale pump station and rising main site.</p>	8 (Medium)	<p>The following measures must be carried out to mitigate against the excessive impact on fauna:</p>	5 (Low)

<sup>14</sup> See Appendix H for more details.

No.	Nature and Consequences of impact	Sig. rating of impacts <sup>14</sup> :	Proposed mitigation and Extent to which impact can be reversed/avoided, managed or mitigated:	Sig. rating of impacts after mitigation:
	<p><i>Impact:</i> Displacement of the faunal community and/or direct mortalities.</p>		<ul style="list-style-type: none"> <li>• If any indigenous faunal species are recorded during construction, activities must temporarily cease to allow fauna to move off. In the event that fauna does not voluntarily move away, an appropriate specialist must be consulted to identify the correct course of action.</li> <li>• Fauna species such as frogs and reptiles that have not moved away must be carefully and safely removed to a suitable location beyond the extent of the development footprint by a suitably qualified ECO, trained in the handling and relocation of animals.</li> <li>• The duration of the construction must be minimised to as short-term as possible, in order to reduce the period of disturbance on fauna.</li> <li>• Any open trenches that are left open for more than two hours, must have at least one end that is sloped/tapered, in order to allow animals that fall in, to escape. If this is not possible, then branches must be placed inside the trenches to allow small animals to climb out of the trenches.</li> <li>• Prior and during vegetation clearance, any larger fauna species noted must be given the opportunity to move away from the construction machinery.</li> <li>• No trapping, killing or poisoning of any wildlife is to be allowed on-site, including snakes, birds, lizards, frogs, insects or mammals.</li> <li>• During the construction phase, noise and vibrations must be kept to a minimum to reduce the impact of the upgrade on the fauna.</li> <li>• During the construction phase, no construction is to occur at night to minimise all possible disturbances to amphibian species possibly inhabiting the wetland.</li> <li>• Staff must be educated about the sensitivity of faunal species and measures must be put in place to deal with any species that are encountered during the construction process.</li> </ul>	
4.	<p><i>Activity:</i> Construction activities for placement of new rising main in wetland and riparian buffer areas.</p> <p><i>Impact:</i> Causing degradation and destruction of indigenous vegetation within the wetland and riparian buffer areas.</p>	8 (Medium)	<p>The following measures must be carried out to mitigate against excessive vegetation clearing/damage:</p> <ul style="list-style-type: none"> <li>• Other than the approved layout no other construction activities and/or construction-related activities may be undertaken within a 20m buffer area of the wetland habitat and 30m of the riparian buffer. The sensitive wetland/riparian habitats must be clearly demarcated and regarded as a 'no-go' area i.e. construction staff must not be permitted access to these areas.</li> <li>• Areas to be developed must be specifically demarcated during the construction phase, preventing movement of</li> </ul>	5 (Low)

No.	Nature and Consequences of impact	Sig. rating of impacts <sup>14</sup> :	Proposed mitigation and Extent to which impact can be reversed/avoided, managed or mitigated:	Sig. rating of impacts after mitigation:
			<p>workers into sensitive surrounding environments. Only the demarcated areas must be impacted upon.</p> <ul style="list-style-type: none"> <li>• Areas must be cleared and excavated on a need basis only, limiting the overall extent of the disturbed area. Areas must be cleared and excavated only as the project progresses.</li> <li>• All lay down, storage areas etc must be restricted to within the construction footprint area.</li> <li>• Rehabilitation of the disturbed areas existing in the project area must be made a priority. Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are endemic to this vegetation type.</li> <li>• Progressive rehabilitation will enable topsoil to be returned more rapidly, thus ensuring more recruitment from the existing seed bank. Any woody material removed can be shredded and used in conjunction with the topsoil to augment soil moisture and prevent further erosion.</li> <li>• If woody material does not meet the quality requirements for other works, the material must be disposed of at a relevant waste disposal site.</li> <li>• Once a rehabilitation method statement has been established and undertaken, monitoring activities must be put in place to verify the progress made on the rehabilitation objectives and targets.</li> <li>• An Invasive Alien Plant Control included in the EMPr must be implemented.</li> </ul>	
5.	<p><i>Activity:</i> Clearing of invasive vegetation within the new pump station footprint</p> <p><i>Impact:</i> Disturbance will act as a driver for exotic species and result in proliferation of exotic weeds i.e. Castor Oil.</p>	7 (Medium)	<p>The vegetation of the site is already highly invaded.</p> <ul style="list-style-type: none"> <li>• Alien vegetation must not be allowed to encroach onto the site and must be continually removed during construction.</li> <li>• Construction must not promote further alien plant disturbances in the surrounding area.</li> </ul>	3 (Low)
6.	<p><i>Activity:</i> Poor construction techniques resulting in failure of the sewage bearing pipeline and pump station during testing.</p> <p><i>Impact:</i> Sewage leaks into the environment leading to decreased groundwater quality beneath and down-gradient of the site by increasing determinants such as E. coli, total coliforms, ammonia, chloride, sodium, manganese, conductivity, colour and turbidity.</p>	10 (Medium)	<p>The following measures must be carried out to mitigate against infrastructural failure during construction:</p> <ul style="list-style-type: none"> <li>• The design of the Northdale pump station and rising main must be completed by a competent engineer.</li> <li>• Construction of the facilities must be done under the supervision of a competent engineer and through the use of a competent contractor using suitable and appropriate construction materials.</li> </ul>	5 (Low)
7.	<p><i>Activity:</i> Decommissioning of the existing pump station.</p> <p><i>Impact:</i> Rubble, soil and material left on-site and in close proximity to the watercourses.</p>	4 (Medium)	<p>The following measures must be carried out to mitigate against impacts associated with decommissioning of the pump station:</p> <ul style="list-style-type: none"> <li>• All rubble must be removed from the site and disposed of at a registered landfill site.</li> <li>• Where the pump station is decommissioned the area must be rehabilitated to match the adjacent slope to prevent pooling of surface water and erosion.</li> </ul>	0 (No impact)

No.	Nature and Consequences of impact	Sig. rating of impacts <sup>14</sup> :	Proposed mitigation and Extent to which impact can be reversed/avoided, managed or mitigated:	Sig. rating of impacts after mitigation:
			<ul style="list-style-type: none"> <li>Rehabilitation must include planting of indigenous vegetation.</li> <li>All areas outside of the construction footprint associated with the decommissioning must be designated as no-go areas.</li> </ul>	
<b>Indirect Impacts</b>				
8.	<i>Activity:</i> Employment demand <i>Impact:</i> Job creation for the local community.	0 (Positive)	This is a positive impact.	0 (Positive)
<b>Operation</b>				
<b>Direct Impacts</b>				
9.	<i>Activity:</i> Mismanagement of the sewer infrastructure and poor maintenance resulting in failure of the sewage bearing pipeline and pump station. <i>Impact:</i> Sewage leaks into the environment leading to decreased groundwater quality beneath and down-gradient of the site by increasing determinants such as E. coli, total coliforms, ammonia, chloride, sodium, manganese, conductivity, colour and turbidity.	10 (Medium)	The following measures must be carried out to mitigate against infrastructural failure due to mismanagement: <ul style="list-style-type: none"> <li>The Northdale pump station and rising main must be managed by trained competent personnel.</li> <li>A maintenance schedule and checklist must be compiled and strictly adhered to.</li> <li>Any complaints received from the local residents regarding odour must be investigated.</li> <li>A biannually surface water monitoring plan must be implemented.</li> </ul>	5 (Low)
10.	<i>Activity:</i> Long term effects as a result of vegetation disturbance during construction. <i>Impact:</i> Continued encroachment and establishment of alien species into the disturbed areas within the sewage system upgrade footprint.	9 (Medium)	There is currently alien vegetation located within the surrounding area. <ul style="list-style-type: none"> <li>Alien vegetation must not be allowed to encroach onto the site and must be continually removed during operation.</li> <li>Maintenance activities must not promote further alien plant disturbances in the surrounding area.</li> </ul>	5 (Low)
<b>Indirect Impacts</b>				
11.	<i>Activity:</i> Decommissioning of the existing sewage infrastructure. <i>Impact:</i> Cessation of all raw sewage spillages within the community and environment.	0 (Positive)	This is a positive impact.	0 (Positive)
12.	<i>Activity:</i> Less maintenance required for sewer infrastructure. <i>Impact:</i> Decreased economic strain on the Municipality	0 (Positive)	This is a positive impact.	0 (Positive)
<b>Cumulative</b>				
13.	<i>Activity:</i> Maintenance will be required for the Northdale pump station and rising main. <i>Impact:</i> Workers walking through the surrounding vegetation and watercourses, disturbing the habitats.	4 (Low)	The maintenance of Northdale pump station and rising main must only be conducted when required and for short periods of time.	2 (Low)
14.	<i>Activity:</i> Cessation of all raw sewage spillages within the community and environment.	0 (Positive)	This is a positive impact.	0 (Positive)

No.	Nature and Consequences of impact	Sig. rating of impacts <sup>14</sup> :	Proposed mitigation and Extent to which impact can be reversed/avoided, managed or mitigated:	Sig. rating of impacts after mitigation:
	<i>Impact:</i> Improved downstream quality of both surface water and groundwater.			

**Table 19: Site-Specific Impacts Associated with Site and Technology Alternative 2**

See Appendix H for the full impacts scoring matrix, which assesses the impacts on the above system. The impacts relating to Alternative 1 and Alternative 2 are very similar, therefore the impacts below include the impacts which differentiate the most between the two alternatives.

No.	Nature and Consequences of impact	Sig. rating of impacts <sup>15</sup> :	Proposed mitigation and Extent to which impact can be reversed/avoided, managed or mitigated:	Sig. rating of impacts after mitigation:
<b>Construction</b>				
<b>Direct Impacts</b>				
1.	<p><i>Activity:</i> Mismanagement of the conservancy tank resulting in raw sewage spillages.</p> <p><i>Impact:</i> Leakage of raw sewage resulting in decreased groundwater quality beneath and down-gradient of the site by increasing determinants such as E. coli, total coliforms, ammonia, chloride, sodium, manganese, conductivity, colour and turbidity.</p>	11 (High)	<p>The following measures must be carried out to mitigate against infrastructural failure during construction:</p> <ul style="list-style-type: none"> <li>The design of the conservancy tank must be completed by a competent engineer.</li> <li>A pumping schedule and checklist must be compiled and strictly adhered to. Additional pumping must be conducted if required.</li> <li>Any complaints received from the local residents regarding odour must be investigated.</li> </ul>	6 (Medium)
<b>Indirect Impacts</b>				
2.	<p><i>Activity:</i> Increased construction costs.</p> <p><i>Impact:</i> Increased economic strain on the Municipality</p>	9 (Medium)	This impact cannot be mitigated.	11 (High)
<b>Operation</b>				
<b>Direct Impacts</b>				
Direct Impacts will remain as per Alternative 1				
<b>Indirect Impacts</b>				
3.	<p><i>Activity:</i> Increased costs associated with the transportation of sewage from the conservancy tank to the wastewater treatment works.</p> <p><i>Impact:</i> Increased economic strain on the Municipality</p>	10 (Medium)	This impact cannot be mitigated.	12 (High)

<sup>15</sup> See Appendix H for more details.

**Table 20: Standard Construction Impacts Associated with Site and Layout Alternative 1 (Preferred) and Layout Alternative 2.**

See Appendix H for the full impacts scoring matrix, which assesses the generic impacts associated with the project and to all site and layout alternatives.

No.	Nature and Consequences of impact	Sig. rating of impacts <sup>16</sup> :	Proposed mitigation and Extent to which impact can be reversed/avoided, managed or mitigated:	Sig. rating of impacts after mitigation:
<b>Construction</b>				
<b>Direct Impacts</b>				
No generic direct impacts				
<b>Indirect Impacts</b>				
1.	<p><i>Activity:</i> Increase in heavy truck traffic on-site and on the surrounding road network as construction vehicles travel to the site for construction activities</p> <p><i>Impact:</i> Increased risk to pedestrians and traffic.</p>	6 (Medium)	<p>The construction activity will pose an increased risk to pedestrians and traffic.</p> <ul style="list-style-type: none"> <li>• Appropriate construction safety signage must be erected to notify of construction activities and potential hazards on-site;</li> <li>• Appropriate barriers must be used to cordon off construction excavations, hazardous areas, and areas undergoing construction.</li> <li>• Flagmen must be in attendance to direct traffic where required.</li> <li>• All drivers must be appropriately licenced and trained.</li> <li>• All drivers associated with the construction must operate within the speed limits, and due caution must be exercised especially when pedestrians are on the road.</li> </ul>	1 (Low)
2.	<p><i>Activity:</i> Movement of construction vehicles.</p> <p><i>Impact:</i> Dusty conditions generated during the construction phase.</p>	5 (Low)	<p>There will be increased dust generated during the construction phase; however, this will be temporary i.e. the site will be worked continuously for a few months until construction is completed. Further to this:</p> <ul style="list-style-type: none"> <li>• Vehicle speed limits must be reduced to 40km/hr to reduce the amount of dust raised along the gravel roads to and from the site.</li> <li>• The material being transported to the site in the back of the trucks must be covered.</li> <li>• Water carts must be used on-site should dust levels elevate to a nuisance level.</li> <li>• Shade cloth must be utilised for stockpiled materials where required.</li> <li>• The applicant must comply with the National Dust Regulations (Government Notice R827, 2013) with regards to dust levels produced on site.</li> </ul>	1 (Low)
3.	<p><i>Activity:</i> Damage to any unidentified existing services on site.</p> <p><i>Impact:</i> Failure of infrastructure that may be affected i.e. water, electricity etc.</p>	8 (Medium)	<p>Services have been identified on the site; however, any unidentified services that will be impacted on must follow:</p>	4 (Low)

<sup>16</sup> See Appendix H for more details.



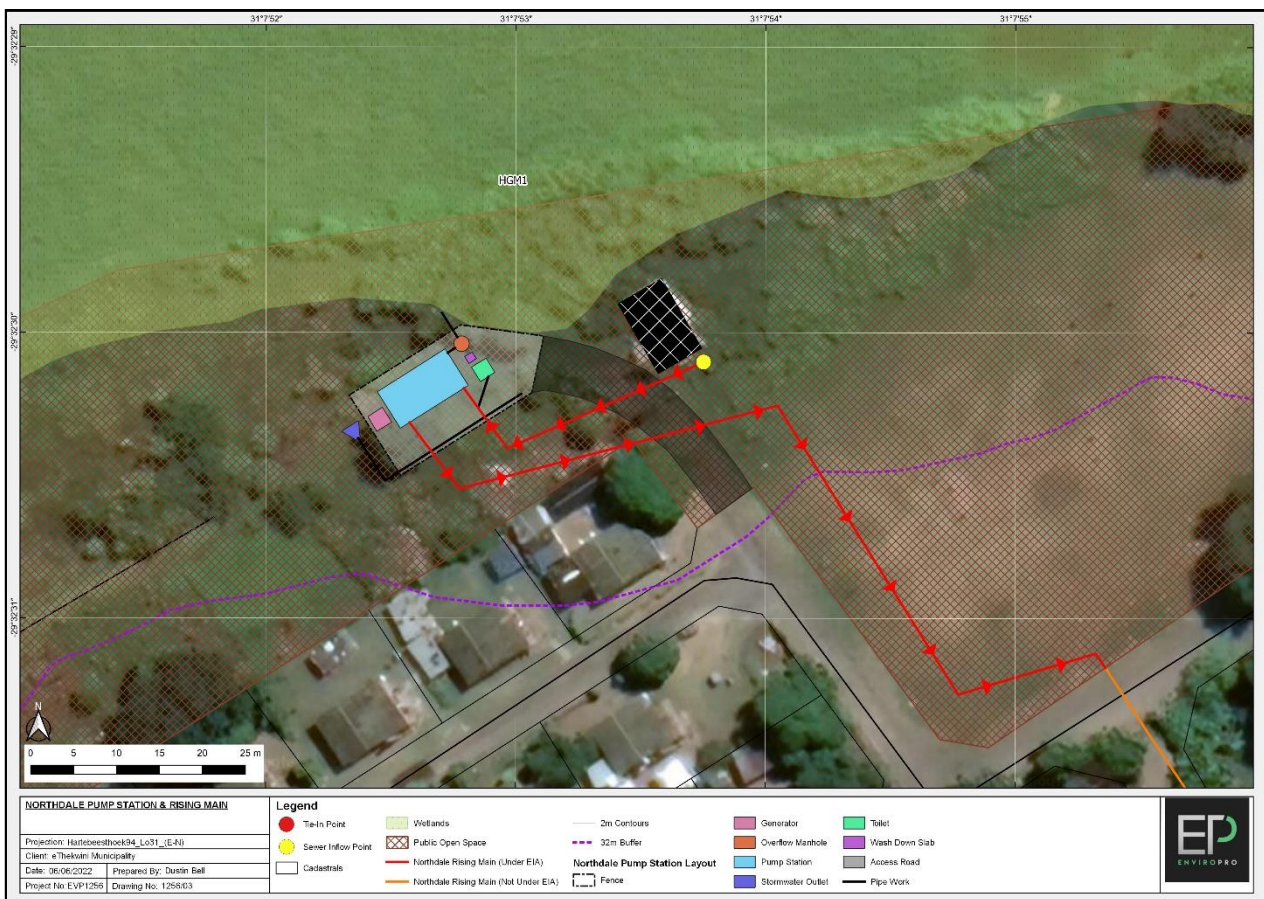
No.	Nature and Consequences of impact	Sig. rating of impacts <sup>16</sup> :	Proposed mitigation and Extent to which impact can be reversed/avoided, managed or mitigated:	Sig. rating of impacts after mitigation:
			<ul style="list-style-type: none"> <li>• As standard construction practice, the engineer and contractor must identify any potential existing services that may be affected before construction.</li> <li>• Any infrastructure that is removed must be replaced, and any damage caused by construction must be repaired.</li> </ul>	
4.	<p><i>Activity:</i> Emissions from construction vehicles associated with the Northdale pump station and rising main.</p> <p><i>Impact:</i> Decrease in the local air quality impacting local residents.</p>	7 (Medium)	<p>The construction phase of the project will see an increase in vehicles moving through the area, which will result in a rise in emissions into the atmosphere.</p> <ul style="list-style-type: none"> <li>• All construction vehicles operating on the site must be fitted with the appropriate silencers and exhausts to reduce the emissions and noise into the atmosphere.</li> </ul>	5 (Low)
5.	<p><i>Activity:</i> Temporary increase in waste and litter due to the construction process associated with the Northdale pump station and rising main.</p> <p><i>Impact:</i> Pollution of the local receiving environment.</p>	7 (Medium)	<p>The construction phase of the project will see an increase in construction staff on-site and therefore, an increase in waste on-site.</p> <ul style="list-style-type: none"> <li>• Littering will not be permitted on site;</li> <li>• Designated waste storage areas with appropriate waste receptacles must be set up within the construction site camp;</li> <li>• Waste must be removed from the site and disposed of at a registered waste disposal site;</li> <li>• Safe disposal slips for the disposal of all waste must be obtained and kept on-site as proof of safe disposal.</li> </ul>	2 (Low)
6.	<p><i>Activity:</i> Insufficient number of toilet facilities on site.</p> <p><i>Impact:</i> Non-compliant with the Occupation Health and Safety Act and pollution of the surrounding habitat.</p>	9 (Medium)	<p>The increase in construction personnel during the construction phase will require an appropriate amount of toilet facilities for the site.</p> <ul style="list-style-type: none"> <li>• Appropriate and sufficient toilet facilities (1 toilet per 15 employees) must be provided by the Contractor;</li> <li>• All toilet facilities must be checked daily;</li> <li>• All toilet facilities must be emptied and cleaned weekly.</li> </ul>	4 (Low)
7.	<p><i>Activity:</i> Inappropriate disposal of toilet waste.</p> <p><i>Impact:</i> Contamination of the environment.</p>	6 (Medium)	<p>The following mitigation measures must be adhered to:</p> <ul style="list-style-type: none"> <li>• All toilet facilities on site utilised by the construction personnel must be checked daily and emptied weekly by the contractor.</li> <li>• A registered waste removal contractor must remove sewage waste from the site, or sewage waste must be disposed of at a permitted Waste Water Treatment Site;</li> <li>• Safe disposal slips for the disposal of effluent waste must be obtained and kept on-site as proof of safe disposal.</li> </ul>	1 (Low)

No.	Nature and Consequences of impact	Sig. rating of impacts <sup>16</sup> :	Proposed mitigation and Extent to which impact can be reversed/avoided, managed or mitigated:	Sig. rating of impacts after mitigation:
8.	<i>Activity:</i> Generation of noise associated with the construction. <i>Impact:</i> Nuisance impact on residents living in close proximity to the construction site.	6 (Medium)	The construction phase of the project will see the increase in vehicles moving through the area, which will increase noise. <ul style="list-style-type: none"> <li>All construction vehicles operating on-site must be fitted with standard silencers to reduce the noise levels produced.</li> </ul>	1 (Low)
9.	<i>Activity:</i> Poor construction methodologies. <i>Impact:</i> Damage to adjacent properties during construction.	7 (Medium)	The following mitigation measures must be adhered to: <ul style="list-style-type: none"> <li>All services must be identified before construction through notifying surrounding stakeholders before any potential traffic congestion;</li> <li>The contractor must create alternative access routes to the properties where required;</li> <li>The contractor must be aware of the stakeholders' movements, and where possible, disruptive activities must be scheduled outside of peak traffic hours;</li> <li>Surrounding landowners and stakeholders must be notified before disruptive events during construction;</li> <li>Any infrastructure that gets removed must be replaced, and any damage caused by construction must be repaired.</li> </ul>	3 (Low)
10.	<i>Activity:</i> Unsustainable sourcing of raw materials such as gravel, sand, water etc. <i>Impact:</i> Promotion of illegal mining operations which can cause significant damage to the environment at other locations.	10 (Medium)	The construction of the pump station and rising main will require raw materials to be sourced and brought to the site. <ul style="list-style-type: none"> <li>Contractors must provide proof of sustainable sourcing of materials, i.e. permits for quarries and sand winning operations from which stone and sand have been obtained.</li> </ul>	5 (Low)
<b>Operation</b>				
<b>Direct Impacts</b>				
No generic direct impacts				
<b>Indirect Impacts</b>				
No generic indirect impacts				
<b>Cumulative Impacts</b>				
No generic cumulative impacts				

### 6.3 Environmental Impact Statement as per section (I)

The critical impacts associated with the Northdale Pump Station and Rising Main relate to those during the construction period, specifically related to the impact on the delineated wetland and riparian areas. These can be best managed by limiting the clearing of vegetation to the construction footprint, treating the wetland and riparian areas outside the construction footprint as sensitive no-go areas, implementing a suitable spill response plan and by implementing effective stormwater management measures throughout the site. Should a large tree or area of indigenous vegetation require clearing, the ECO must be consulted before clearing takes place. There are only a few negative operational impacts, with the key identified impact being the risk of raw sewage spillages contaminating the environment due to the mismanagement of the pump station. This negative impact can be fully mitigated against if a rigid maintenance plan is implemented throughout the life-span of the pump station. A number of positive impacts may result from the Northdale Pump Station and Rising Main; these relate to the cessation of raw sewage spillages which is frequent due to blockages of the sewer infrastructure. The economic benefits also include a reduced maintenance budget due to fewer blockages. All identified impacts can only be mitigated if all conditions stipulated in the EMPr are adhered to during both the construction and operational phases. Therefore, there should be no significant impacts related to the construction and operation of Northdale Pump Station and Rising Main, as depicted in Figure 16 below. Taking into consideration the above impacts and mitigation measures, it is the EAP's opinion that the Northdale Pump Station and Rising Main be authorised.

Figure 11: Aerial Photograph Showing the EIA Triggers.



#### 6.4 Impact Management Objectives and Outcomes for the Development for Inclusion in the EMP as Per Section 3(m)

The following objectives and outcomes must be considered for this project:

- Objectives:
  - For there to be no lasting negative impacts on the environment once construction is complete and during the lifespan of the pump station and rising main, specifically regarding the delineated wetland a riparian area.
  - To practice responsible construction, 'best practice' with regards to housekeeping on-site during construction and operation (outlined within the EMP) and enforce the polluter pays principle. The applicant and contractor must be responsible for their actions on-site during construction and the rehabilitation of the site post-construction.
- Outcomes:
  - To promote sustainable development. Create infrastructure and an environment that is healthy and sustainable for future generations to come.

#### 6.5 Assumptions, Uncertainties and Gaps in Knowledge Relating To the Assessment and Mitigation Measures Proposed As Per Section 3(o)

The following assumption and limitations were identified in the Biodiversity Report<sup>17</sup>:

- *The assessment was conducted on those portions of the project area as originally defined by the client, any changes in the project boundary subsequent to this may negatively impact the robustness of this report.*
- *The assessment area was based on the route provided by the client and any alterations to the route and/or missing GIS information pertaining to the assessment area would have affected the area surveyed.*
- *As per the scope of work, the fieldwork component of the assessment comprised one assessment only and therefore, this study has not assessed any temporal trends. This has further implications, as not all angiosperm species will be flowering, which is generally required for identifying geophytes, epiphytes and lithophytes.*
- *Only the wetland edge could be surveyed due to the water column depth of the system, as well as warning signs of pollution. It is assumed that the Tongaat Hulett Sugar Mill discharge into the system, as the warning signs possessed their logo.*

The following assumption and limitations were identified in the Water Resources Report<sup>18</sup>:

- *The wetland assessment was based on the results of a single wetland survey only, and the information provided should be interpreted accordingly;*
- *Only wetlands that were likely to be impacted by proposed development activities were assessed in the field. Wetlands located within a 500 m radius of the sites but not in a position within the landscape to be measurably affected by the developments were not considered as part of this assessment;*
- *Aquatic field assessments were completed to assess as much of the site as possible with the focus on the proposed directly impacted and downstream areas;*
- *Information regarding the specific activities to take place was not available during the compilation of this report. Therefore, assumptions regarding the proposed activities have been made in the risk assessment completed for this project; and*
- *The GPS used for water resource delineations is accurate to within five meters. Therefore, the wetland delineation plotted digitally may be offset by at least five meters to either side.*

#### 6.6 Period for Which Authorisation Is Required, Proposed Monitoring and Auditing and Post Construction Requirements

Environmental Authorisation is required for the Northdale Pump Station and Rising Main within the 2022/2023 business plan for the eThekweni Municipality. The authorisation would need to be valid for ten years, within which time construction would need to commence.

Given the nature of this project, it is recommended that **monthly** ECO audits be carried out for the duration of the construction phase of this project. One post-construction audit should be conducted once construction is complete.

<sup>17</sup> The Biodiversity Company (2020) Northdale Sewage Pump Station and Rising Main System Upgrade, Ecological Assessment – Appendix B

<sup>18</sup> The Biodiversity Company (2020) Water Resource Assessment for the Proposed Northdale Sewage Pump Station – Appendix B

The EMPr details the post-construction, rehabilitation, and closure objectives which will be monitored by the ECO and compliance authorities.

**6.7 Financial Provisions as Per Section 3(s)**

The contractor is responsible for and must ensure that the site has been rehabilitated in full before leaving the site. No upfront financial provision is required for this project.

**6.8 EAP Opinion on Whether Or Not to Authorize Activity and Recommendations and Conditions for Authorisation as Per Section 3(n) and (p)**

Concerning the site and technology alternatives, it is recommended that preferred alternatives be authorised. The significance of the impacts associated with the Northdale Pump Station and Rising Main are considered 'low'.

**Appendix A: Drawings and Maps**

**Appendix B: Specialist Reports**

<b>No.</b>	<b>Prepared By</b>	<b>Authors</b>	<b>Professional Registrations</b>	<b>Title of Report</b>	<b>Date of Report</b>
6	DFFE	-	-	DFFE Screening Reports	June 2022
2	The Biodiversity Company	M. Desai	-	Ecological Assessment	November 2019
3	Geomeasure Group	T. Swales	Pr.Sci.Nat.	Geohydrological Investigation	March 2020
4	GCS	D. Franklin	-	Geotechnical Investigation	January 2020
5		Prof M. Bamford	FRSSAf, mASSAf, PSSA, SASQUA, INQUA, IOP	Palaeontological Impact Assessment	April 2020
6	The Biodiversity Company	W. Jackson	Pr.Sci.Nat.	Water Resource Assessment	March 2020
7	eThekwini Municipality	R. Nel	-	Engineering Design Report	May 2022

**Appendix C: Public Participation**

C1: I & Ap Notification Register



C2: Registered I &Aps And Proof Of Registration

C3: E-Mail / SMS / Postal / By Hand Notifications To I & APs, Ward Councillors And Authorities

C4: Meeting Minutes and Registers

C5: Proof Of Placement Of Notice Board

C6: Proof Of Placement Of Advert

C7: Comments And Response Table

C8: Comments And Responses Received

**Appendix D: Impacts Scoring Matrix**



**Appendix E: EAP Declaration**

**Appendix F: Environmental Management Programme**