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**DRAFT Basic Assessment Report
Greater Efaye Secondary Bulk Water Pipeline &
Reservoirs**

uMshwathi Local Municipality

Umgungundlovu Municipality

EIA Ref. No. : DC22/0024/2017



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

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Executive Summary

The uMgungundlovu Municipality plans to construct the Greater Efaye Secondary Bulk Water Pipeline and associated Reservoirs as part of Phase 2 of the uMshwathi Bulk Water Scheme. The project involves the construction of a 160mm diameter bulk water pipeline and five new concrete reservoirs. The pipeline will be located to the north of Dalton town and north east of New Hanover within Ward 3, 4 and 14 of the uMshwathi Local Municipality and Ward 1 of the Umvoti Local Municipality. The pipelines will provide a reliable source of potable water to the area from the existing reservoir.

The majority of the pipeline will run in road reserves however the pipeline will cross underneath the Mvoti River and will also cross tributaries of this river at three locations (RC1-3). This will result in the excavation and deposition of material into watercourses, triggering a Basic Assessment process. The pipeline will be encased with steel except where it is within the watercourse, where it will be encased in concrete and will be run under the watercourses (detail engineering designs included in Appendix A). Gabion baskets and/or reno-mattresses will be constructed for additional protection of the crossing structures, if required.

The following key impacts and mitigation measures were assessed:

- **Damage to watercourse banks, wetland areas and riparian zones from construction activity:** The river crossings are to be treated as sensitive areas. No stockpiling is to occur directly adjacent and within 32m of watercourses and any excavation is to be carried out by hand, where possible to avoid vehicles travelling in the watercourse. The trench is to be kept to a minimum width to reduce the disturbance footprint.
- **Pipeline impeding or altering flow of the watercourses:** The pipeline will be below the level of the river bed and will be encased in concrete. Gabions and reno-mattresses will be placed just downstream of the pipe and will be below the level of the river bed in order to maintain the river bed profile.
- **Loss of riparian vegetation during excavation across watercourses:** Vegetation clearing is to be kept to a minimum due to the small size of the pipe and associated trench. The trench is to be dug by hand at the watercourse crossings, where possible to prevent unnecessary clearance. The potential for erosion is to be monitored by the Contractor on an ongoing basis during clearing.
- **Encroachment of alien vegetation into areas disturbed during construction:** Disturbance associated with the construction, will result in an increase in alien invasive species in the area. These species, within the construction footprint, must not be allowed to encroach onto the site and adjacent areas. Alien vegetation must be continually removed during construction as per the EMPr.
- **Damage to surrounding properties & services:** The construction activity could disrupt access to existing services, and residential properties as it is being placed within existing road reserves. All services must therefore be identified prior to construction and signboards erected notifying residents of the construction.
- **Improved services:** The water supply scheme will improve service delivery to the area increasing the potable water supply. This is a positive impact.

These impacts can be mitigated by following the recommendations in this report and Environmental Management Program (EMPr). Construction activities will be monitored on a monthly basis by an independent Environmental Control Officer (ECO) and controlled through the implementation of the attached EMPr.

Taking into consideration the above impacts and mitigation measures, it is the EAP's opinion that there are no significant environmental impacts associated with the proposal which cannot be mitigated. Therefore, it is recommended that the project be authorised.

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Section 1: Scope of Work and Location of Activity

1.1 Project Title

Greater Efaye Secondary Bulk Water Pipeline and Reservoirs within the uMshwathi Local Municipality.

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

The uMgungundlovu District Municipality propose to construct the Greater Efaye Secondary Bulk Water Pipeline and 5 concrete Reservoirs within Ward 4 of the uMshwathi Local Municipality. The pipeline will be a 110mm uPVC and 100mm klambon pipeline which will tie into an existing bulk water pipeline that runs along an existing pipeline route. There are currently small municipal reservoirs supplying the immediate area. The construction of the new reservoirs and the new bulk water pipeline will increase the supply capacity of potable water to the area. The existing reticulation will not be upgraded at this stage. A small section of the pipeline crosses the Mvoti River (RC4) and three tributaries of this river (RC1 – 3). A section of the pipeline also falls within the KwaZulu-Natal Sandstone Sourveld (SVs5) which is listed as “endangered”, however this does not trigger an environmental authorisation as the area is already transformed by sugarcane farms.

The bulk water pipeline will be placed in trenches approximately 1.5 m wide and less than 1.5m deep. The pipeline will be encased with steel to prevent leaks and theft of the pipes during operation; except where it crosses the water crossings where it will be encased in concrete. Figures 1- 3 illustrate the locality of the proposed pipeline route as well as the locations of the existing and newly proposed reservoirs. Maps showing details of the river crossings are provided in Appendix A of the report.

As far as possible, the new pipeline route has been aligned within the existing road reserve of the P381 Road. Where the pipeline crosses the non-perennial watercourses (RC1-RC3) with no need for temporary diversions, it will be placed under the riverbed within a concrete pipe encasement. A temporary stream diversion will be required for construction of the pipe across the Mvoti River. Sand bags will be used to temporarily divert half river within the existing channel during construction. Once half the construction of the pipeline is complete the other half of the river will be temporarily diverted within the river channel and the pipeline constructed. There is wetland area associated with the two water course crossings, namely RC1 and RC4, however it is not anticipated that there will be long term loss of wetland. The crossings have been labelled RC1, RC2, RC3 and RC4 throughout the report.

The watercourse crossings will result in the infilling / excavation of more than 10m³ of material within a watercourse. The Basic Assessment Report and Environmental Management Report (EMPr) therefore focus on these watercourse crossings. The construction of the new bulk line will provide a reliable water source to existing and future households within the Efaye area. The project will therefore have a positive impact on the community living in this area.

1.3 Description Of Feasible Alternatives As Per Section 3(h)(i)

Site Alternatives

The aim of the project is to increase the reliable, potable water supply to the area and therefore there are no site alternatives. Since the pipeline follows existing roads in the area and needs to connect to existing water pipelines, there were no alternative layouts considered. Different pipe materials were initially investigated however there is only one technology alternative as the specifications of the pipeline and reservoir need to fall within the appropriate designs standards.

See Appendix A for Engineering Drawings.

The No Go Alternative

The construction of the Greater Efaye bulk pipeline and reservoirs will not occur and the existing bulk pipeline and the smaller reservoir will remain in use. This will place pressure on the infrastructure in the future with the anticipated future expansion of water users in the area. A new bulk supply and reservoir will still be required to meet future demand.

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

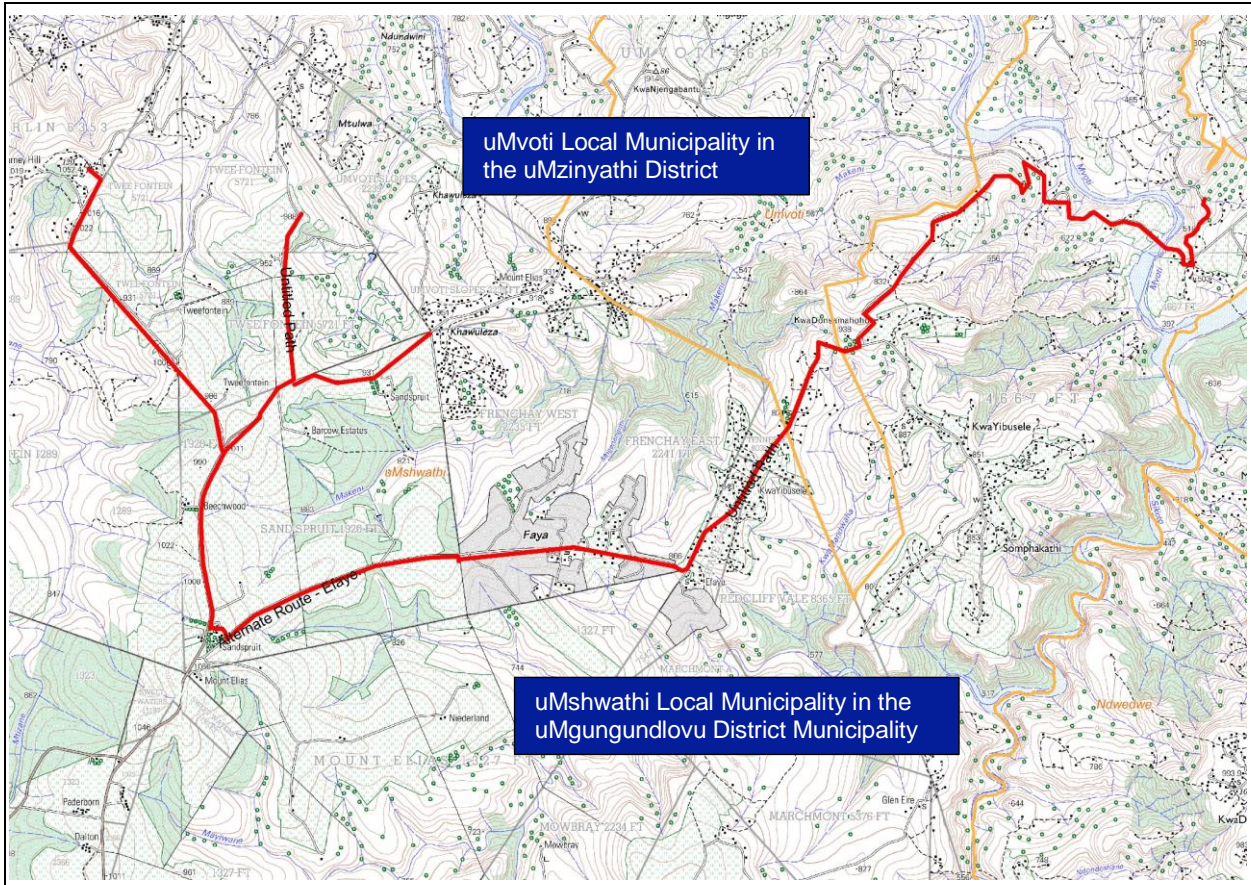
GNR	Activity Number	Activity as per the legislation	Activity as it applies to the proposal
GNR 327 Listing Notice 1; 7 th April 2017	12 (ii)(a) & (c)	<i>The development of – (ii) infrastructure or structures with a physical footprint of 100 square metres</i>	Cumulatively, more than 100m ² of pipeline will be placed within 32m of the Mvoti River and its tributaries.

		or more (a) within a watercourse; (c) if no development setback exists within 32 metres of watercourse, measured from the edge of a watercourse.	
GNR 327 Listing Notice 1; 7 th April 2017	19.	(i):The infilling or depositing of any material of more than 10 cubic meters into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from - (i) A watercourse	The pipeline crosses the Mvoti River and tributaries of this river in four locations (RC1-4). The pipes will be encased with concrete and placed, underneath the watercourses. The excavations to allow pipes to be placed underground will result in more than 10m ³ of material being removed and deposited within the various watercourses.

1.5 Location Of Activity As Per Section 3 (b)(i)-(iii)

District Municipality		uMgungundlovu District Municipality.	
Local Municipality		uMshwathi Local Municipality.	
Ward		4	
Area / Town / Village		Efaye	
Co-ordinates:		Latitude	Longitude
	Pipeline Start point	29°14'25.05"S	30°44'15.67"E
	Pipeline End point	29°14'42.20"S	30°53'6.72"E
	RC1	29°14'38.76"S	30°51'51.49"E
	RC2	29°14'44.48"S	30°52'2.11"E
	RC3	29°14'46.30"S	30°52'8.61"E
	RC4	29°14'58.43"S	30°52'45.42"E
Property Description:		Parent Farm:	Farm Portion:
		Umvoti Location 4667	20
21 Digit Surveyor General's numbers:		NOFT00000000466700020	

Figure 1: 1:55 000 Topographical Map Showing Greater Efaye Pipeline in Red (source: PlanetGIS, 2017)










Title	Greater Efaye Pipeline & Reservoirs	Legend	 Cell: 082 568 3687 E-mail: josette@enviropro.co.za Cell: 082 887 4362 E-mail: iain@enviropro.co.za Phone: 031 765 2942 Fax: 086 549 0342
Co-ordinates	29°17'11.94"S; 30°48'59.24"E)	 Watercourse	
Scale	1:55 000	 Wetland	
Topographical Sheet No.	2930BA, 2930BB, 2930BC & 2930BD	 Plantations	
Drawing No.	Greater Efaye #01	 Contour	
Date Prepared	23 rd March 2017	 Pipeline	
Prepared By	Stephanie Denison	 Urban Areas	

Figure 2: Aerial Photograph Showing an Overview of the Proposed Greater Efaye Pipeline (red) and Associated Reservoir circled in Yellow. (source: Google Earth Pro, 2017).

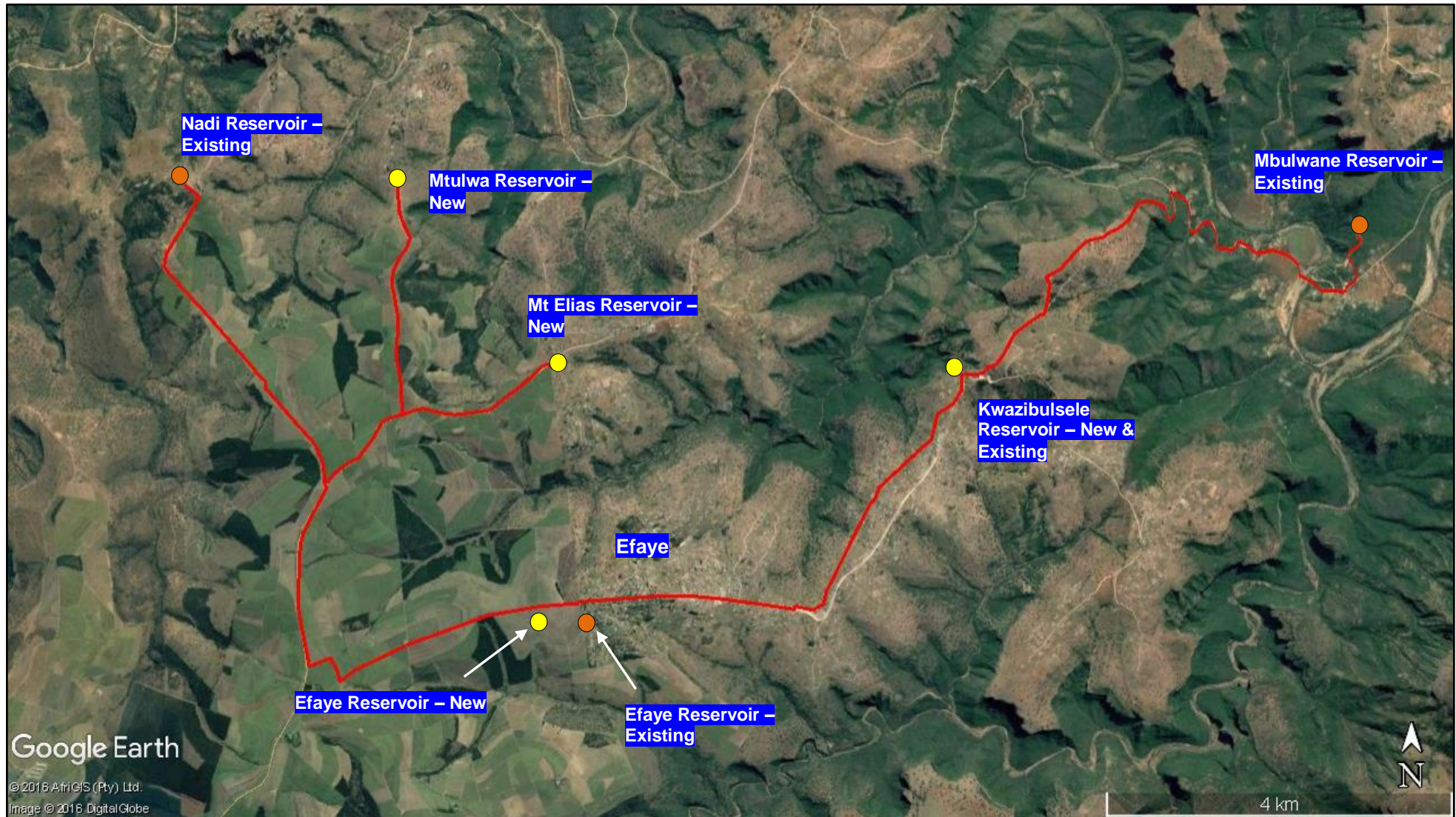
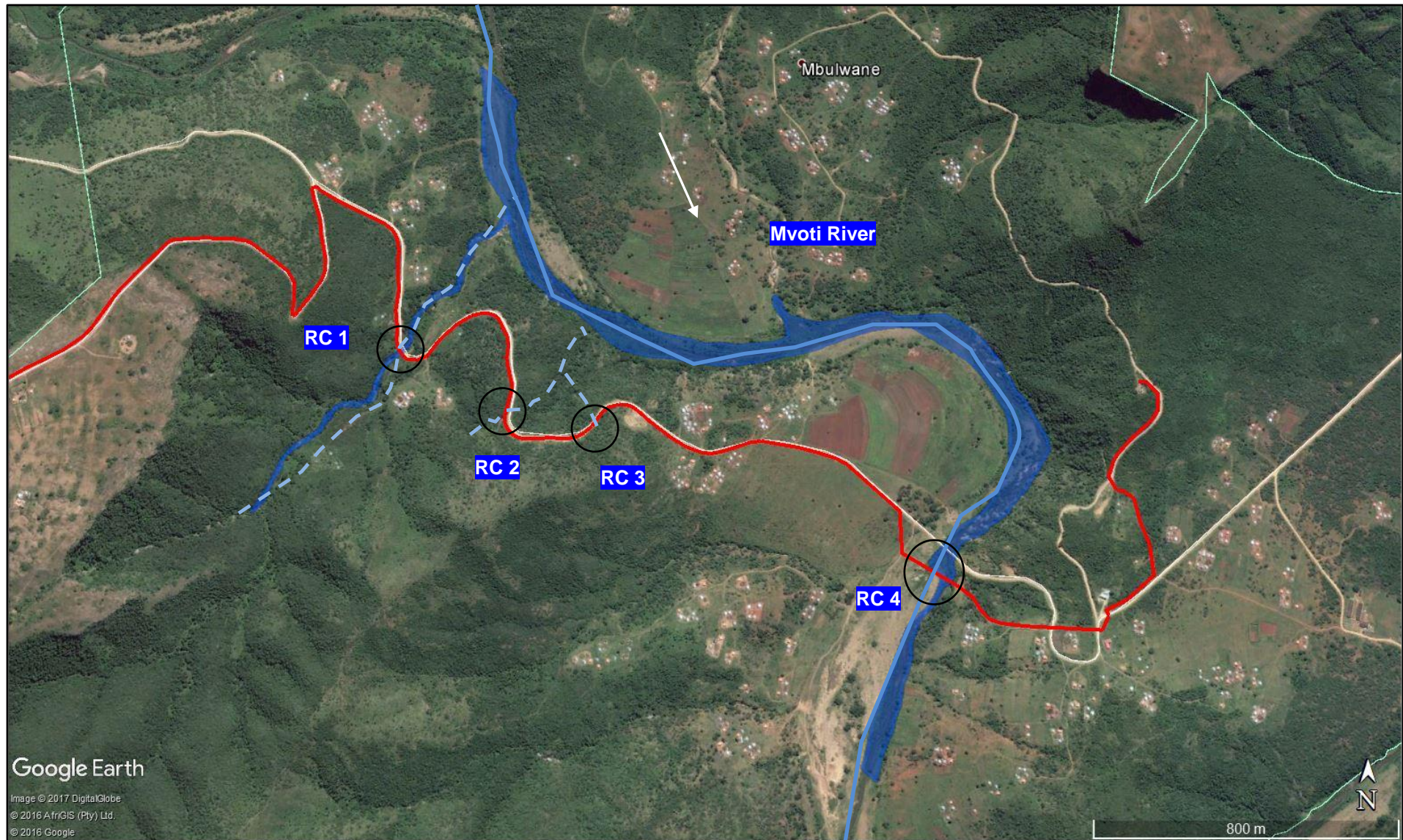


Figure 3: Aerial Photograph Showing an Overview of the Proposed Greater Efaye Pipeline (red), associated River Crossings and wetland (shaded in blue). (source: Google Earth Pro, 2017).



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

Information provided in this section has been extracted from the various specialist reports, which are attached under Appendix B of the BAR.

2.1 Topography and Physical Characteristics of Site

The area associated with the new bulk pipeline consists of rural area and an open valley. The pipeline runs along road reserves, therefore vegetation in this area has been previously disturbed. The gradient drops steadily from the existing Mbulwane reservoir to the west of the project area. Photographs taken within the study area that show the surrounding topography are included in Figure 3.

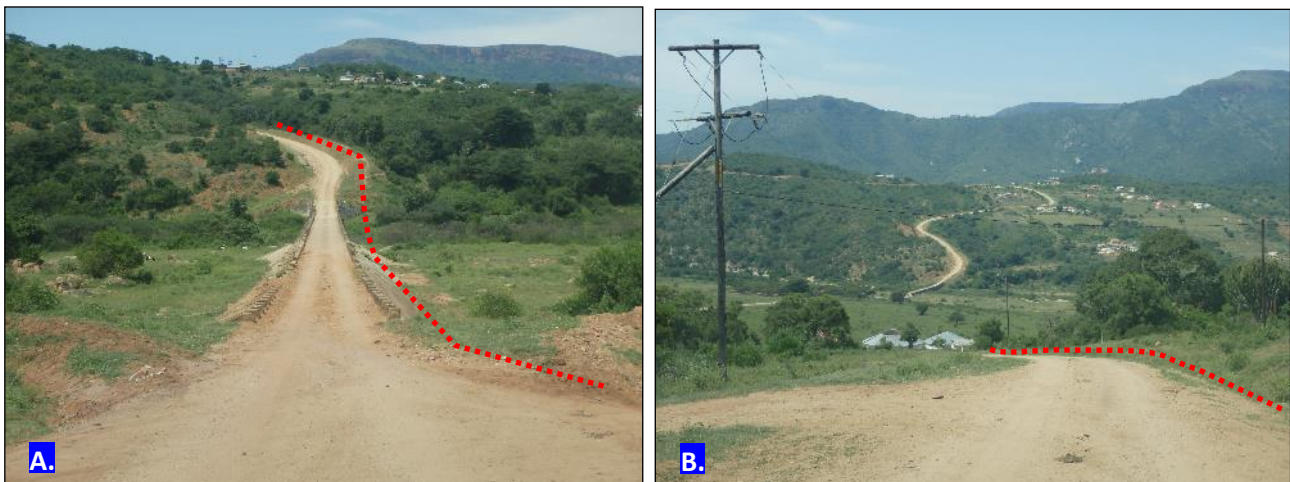
The gradient of the site is as follows:

Gradient	Description
Flat	There are areas of the study area where the gradient flattens out completely.
1:50 – 1:20	The gradient increases slightly long the P381 road to the western sections of the project area.
1:20 – 1:15	The gradient gradually increases from Kwazibusele new reservoir site towards the west section of the pipeline.
1:15 – 1:10	
1:10 – 1:7,5	The gradient becomes quite steep along the P381 road towards the existing the Mbulwane reservoir.
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 follows:

Topographical Feature	Description
Ridgeline	N/A
Plateau	N/A
Side slope of hill/mountain	N/A
Closed valley	N/A
Open valley	The gradient associated with the pipeline route is steep with an open valley at the point where pipeline crosses the Mvoti River.
Plain	N/A
Undulating plain/low hills	The gradient associated with the pipeline route is very gentle with low undulating hills in sections of the topography.
Dune	N/A
Sea-front	N/A

Figure 3: Photographs Showing the Topography and Characteristics of the Study Area.



(a) Photograph showing the gradient of the western portion of the project area where the pipeline will run parallel to P381 Road over the Mvoti River; **(b)** Photograph of the eastern portion of the pipeline where it runs along the P381.

2.2 Surface Water and Ground Water

The Greater Efaye pipeline is located within the U40E Quaternary Drainage Region within the Mvoti to Umzimkulu Water Management Area (WMA 11). The region has a mean annual precipitation rate of 800 to 1 500 mm and is considered humid. The activities in the area and local land uses have had impacts on the aquatic system and visible disturbances are significant (section 6.1.4 of the Water Resource Assessment). The system is regarded as largely natural (Class B) by the aquatic specialist (Appendix B).

The pipeline crosses the main channel of the Mvoti River at 29°14'58.43"S; 30°52'45.42"E (Figure 4). The aquatic ecosystem of the Mvoti River associated with RC4 was characterized by the aquatic specialist as "very slow flowing waters over mostly sand substrates, with isolated areas of stones in and out of current, gravel and mud" (section 6.2 of the Water Resource Assessment in Appendix B).

Three smaller tributaries of the Mvoti River are crossed by the pipeline at RC1 (29°14'38.76"S; 30°51'51.49"E), RC2 (29°14'44.48"S; 30°52'2.11"E) and RC3 (29°14'46.30"S; 30°52'8.61"E). The tributaries are non-perennial. Water only flows in these drainage lines after there has been rainfall in the area. Photographs showing the condition of the watercourses at RC1 – RC3 are provided in Figures 5 and 6 below respectively.

The pipeline will be placed underground, within the road reserve of the P381 Road. The construction of the pipeline across the river at RC4 will require a temporary diversion of the river to allow the pipeline to be constructed. The impacts of the temporary diversion will be low if mitigated as per this report and EMP. An engineering drawing showing a typical cross section of the pipeline through the watercourse is included in Appendix A. The pipeline will be encased in concrete and will extend a minimum of 2 metres beyond the edge of the watercourse.

Figure 4: Photographs Showing the Conditions of the Watercourse at RC1



(a): Upstream of RC1. **(b):** Downstream of RC1. **(c):** A culvert upstream of RC1.

Figure 5: Photographs Showing the Conditions of the Watercourse at RC2



(a): Overview of RC2 adjacent to the P381 **(b):** Upstream of RC2. **(c):** Downstream of RC2.

Figure 6: Photographs Showing the Conditions of the Watercourse at RC3**(a):** Downstream of RC3. **(b):** Upstream of RC3. **(c):** A culvert situated upstream of RC3.**Figure 7 : Photographs Showing the Conditions of the Watercourse at RC4****(a):** Upstream of RC4. **(b):** Downstream of RC4. **(c):** Overview of RC4. Blue line showing the Mvoti River.

2.2.1 Wetlands

The Water Resource Assessment carried out by The Biodiversity Company in May 2017, found that there is one National Freshwater Ecosystem Priority Areas (NFEPA) within 500m of the pipeline, however it is classified as artificial with a rank of 6 (worst ranking). Therefore this was not considered for this assessment. A Channelled Valley Bottom (HGM A) wetland was found to be associated with RC1 and RC4 during the site assessment (shaded in blue in Figure 3 above).

The wetland identified has been moderately impacted upon by the development of infrastructure and the large scale sugarcane farming (section 6.4 of the Water Resource Assessment).

The wetland system was determined to be in a moderately modified state owing to impacts imposed on the system (section 6.4 of the Water Resource Assessment). The biggest impacts are due to the infestation of alien vegetation erosion in some places. The operational phase of the project is unlikely to change the Present Ecological Status of the wetlands.

Provided that the mitigation measures provided by the wetland specialist and included in the EMP (Appendix J) are followed during construction, the project proposal should not have any negative impact or influence on the wetlands associated with the site. Taking into account that this project is for potable water, the significance of any impacts resulting from pipeline leaks and spillages is considered low (section 7 of the Water Resource Assessment in Appendix B).

2.3 Fauna and Flora

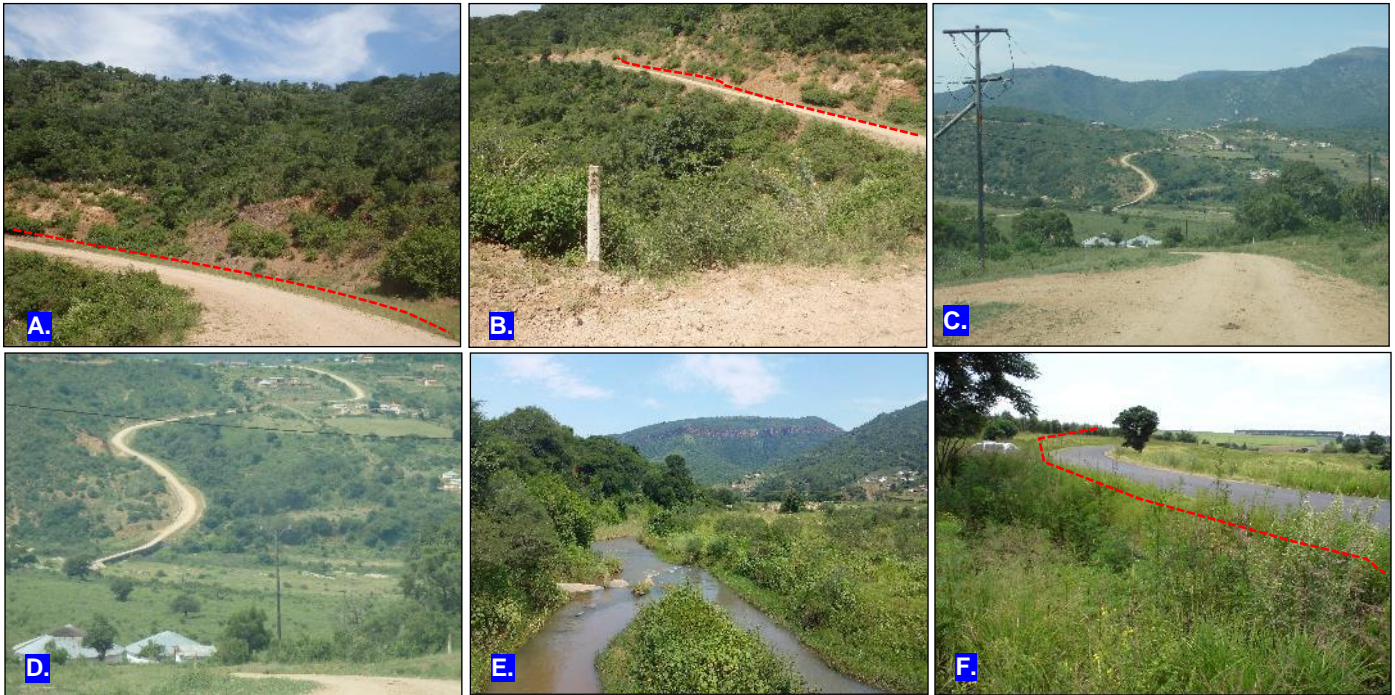
Arising out of KZN Wildlife's Mission Statement, which is to ensure the conservation and wise use of KZN's indigenous living resources (biodiversity) in partnerships with people¹, KZN Wildlife have mapped "Critical Biodiversity Areas" (CBAs) across the province. Formally protected areas are not effective enough at conserving biodiversity and therefore CBAs identify natural / near-natural areas, outside of the formally protected areas, which are used as a tool for land-use planning and decision-making.

¹ Ezemvelo KZN Wildlife website (www.kznwildlife.com). Accessed on the 13th April 2017.

Sections of the pipeline pass through an area identified as “Critical Biodiversity Area 3 Optimal” (see Figure 8). However, there will not be any clearance of indigenous vegetation as the pipeline is to be constructed within the road reserve.

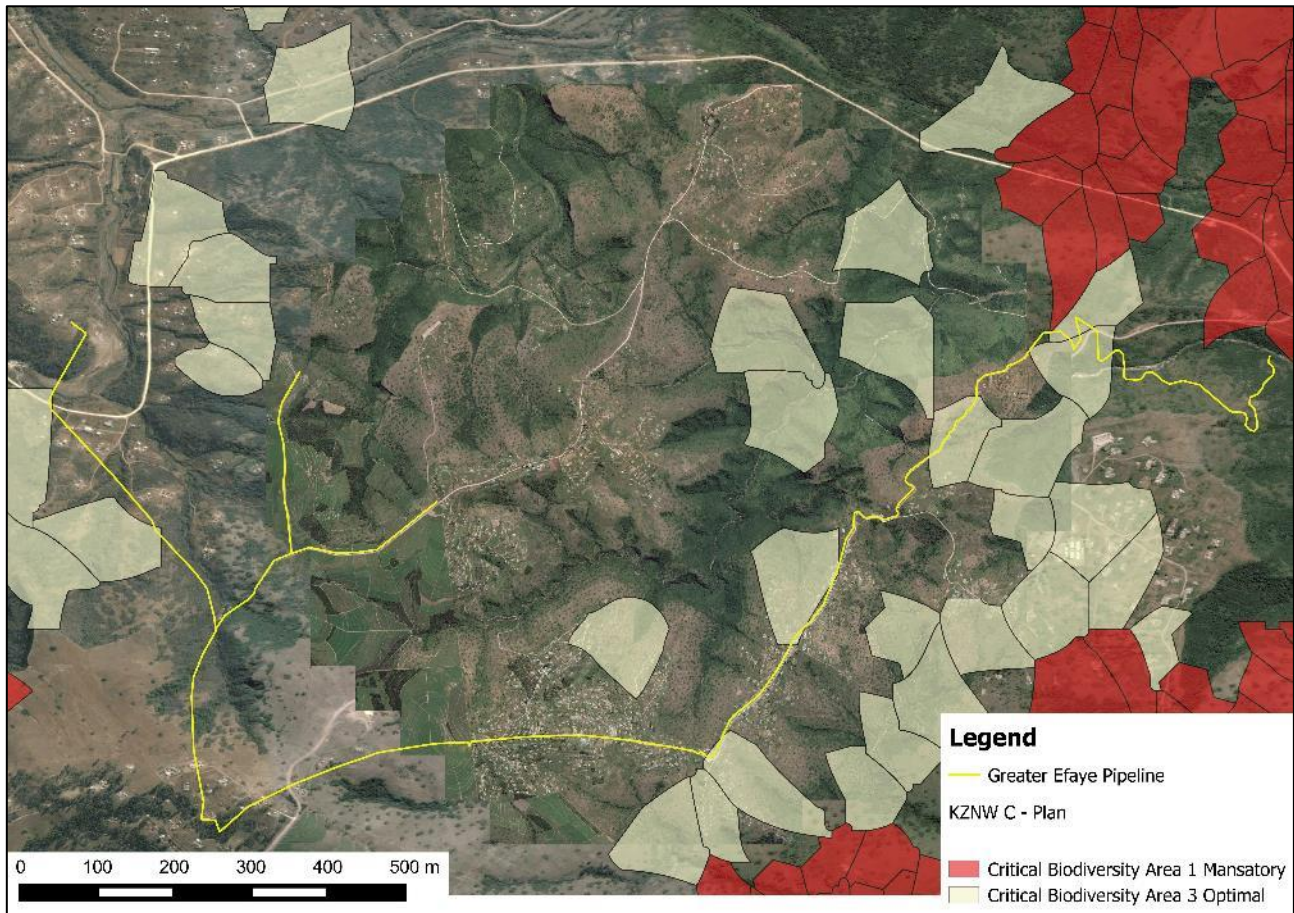
The pipeline has been aligned to follow existing roads where the vegetation tends to be more disturbed and invaded by alien species. The small size of the trench (approximately 1m wide) means that very little vegetation will require clearing. The contractor must however ensure that invasive species do not gain a foothold along the cleared route until the planted indigenous vegetation has had time to re-establish.

Figure 7: Photographs showing the vegetation on site. The approximate location of the pipeline is shown with the red line.



(a): Vegetation associated with the RC2 along the pipeline route. **(b):** Image showing vegetation along the pipeline route. **(c):** Vegetation in the eastern portion of the pipeline route where the road joins the L1108 Road reserve **(d):** Vegetation associated with the RC4. Photographer facing east. **(e):** Vegetation associated with RC4 where the pipeline is to cross under the Mvoti River. **(f):** Disturbed vegetation associated with WC3.

Figure 8: The proposed Greater Efaye Pipeline route within a Critical biodiversity Area identified in the KZN Wildlife Conservation Plan (source: QGIS with KZNW C-Plan Overlay).



2.4 Heritage and Cultural Aspects

Since the pipeline will be placed in areas previously disturbed by construction activities (i.e. roads and farming), it is not anticipated that there is any heritage or cultural value associated with the project area. Construction workers will however be cautioned to operate with care on site and should a culturally sensitive aspect be discovered on site that has not been previously identified, construction activities stop temporarily and the issue assessed and the authorities (AMAFA) notified if need be.

2.5 Socio-Economic Environment

The project area is located in the uMshwathi Local Municipality, approximately 14km north of Dalton. The surrounding land uses include small rural towns and large scale sugarcane farming. All residential dwellings in the area are located outside the road reserves where construction activity will be taking place. The new bulk water pipeline is a strategic development to facilitate community development within the local area and will therefore have a positive impact on the socio-economic environment.

2.6 Surrounding Environment and Land Uses

The environment and surrounding land uses within and adjacent to the pipeline and reservoirs are described as follows:

- Located within a rural area north of Dalton town.
- The area is surrounded by sugarcane fields.
- There are residential houses within Efaye.

The surrounding environment and land use will not be negatively affected by the water pipeline as the construction footprint will follow the same alignment as existing roads and servitudes. The pipeline will be located underground and will therefore not deter from the aesthetics of the area.

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)

Legislation	Compliance of Activity
National Environmental Management Act 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 (EMPrs) 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: GN R982, R983, and R985 under Section 24 of NEMA define the activities that require Environmental Authorisation (EA) and the processes to be followed to assess environmental impacts and obtain EA.</p> <p>Environmental authorisation is required for the construction of the bulk water pipeline across the Mvoti River and its tributaries. This application is therefore in line with the requirements of NEMA.</p>
National Water Act 1998	<p>The construction of the pipeline across the watercourses will result in alternations to the bed and banks of these watercourses. The specialist has delineated wetland associated with two of the watercourse crossings and therefore a Water Use Authorisation (WUA) will be required under Section 21 c and i of the National Water Act. The WUA application is running concurrently with the EIA process.</p>
National Waste Management Act 2008	<p>Reforms the law regulating waste management to prevent pollution and ecological degradation.</p> <p>Section 19 allows the Minister to publish a list of activities, which require a Waste Management License. The most recent list is published in Government Gazette 37083 Notice No. 921 dated 29 November 2013. The proposal will not trigger a Waste Management Activity.</p>
Environmental Conservation Act 1996	<p>Makes provisions for the application of general environmental principles for the protection of ecological processes, promotion of sustainable development and the protection of the environment. This Act has mostly been repealed by NEMA.</p>
National Environmental Management Biodiversity Act 2004	<p>To provide the framework, norms, and standards for the conservation, sustainable use and equitable benefit-sharing of South Africa's biological resources. Section 52 allows for the publication of a list of threatened ecosystems in need of protection. The list was published in Government Gazette No. 34809 Notice No. 1002 dated 9 December 2011. The pipeline does not fall within a threatened ecosystem. A section of the pipeline falls within KwaZulu-Natal Sandstone Sourveld, listed as endangered, however it has been transformed by the agriculture of sugarcane in the area.</p>
National Heritage Resources Act 25 of 1999	<p>For the protection of South African Heritage to nurture and conserve communities legacy. No areas of cultural or heritage significance have been identified however AMAFA will be contacted should any objects of importance be found during construction.</p>
Municipal Planning Framework	
Umgungundlovu Municipality Integrated Development Framework 2015/2016	<p>This project falls in line with the uMgungundlovu Municipality's development outcome, which is to provide potable water to all communities within the municipality. This forms part of the Municipality's 5 year plan.</p>

Section 4: Motivation, Need and Desirability

4.1 Need and Desirability as Per Section 3(F)

The project is part of the Umshwathi Bulk Water Scheme (Phase 2). The bulk pipeline will supply the 5 new, larger reservoirs proposed in the Efaye area with potable water. The new infrastructure will therefore ensure that there is a reliable source of potable water to this area.

4.2 Motivation for Preferred Site, Activity and Technology Alternative

The aim of the project is to upgrade the bulk reticulation and reservoirs in the Efaye area and therefore there are no site alternatives. Since the pipeline follows existing roads there are no alternative layouts. Different pipe materials were initially investigated however there is only one technology alternative as the pipe specifications and reservoir need to fall within the appropriate design standards.

The four river crossings cannot be avoided however after consideration of the mitigation measures provided by the specialist and included in the attached EMP, it is the opinion of the EAP that there are no significant environmental impacts that cannot be mitigated against and that the Greater Efaye pipeline route be authorised.

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;*

Two noticeboards (in isiZulu and English) were placed along the pipeline route on the 15th March 2017. The noticeboard detailed uMgungundlovu Municipality's proposed plan to construct the bulk water pipeline and 5 reservoirs, 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;*

It is to be noted that the pipeline will be placed in the Department of Transport (DoT) Road Reserves and therefore DoT have been included in the I & AP list to receive more information on the project. The following steps were followed during the public participation process.

- An email notifying all authorities, including the local municipality, was sent on the 31st January 2017.
- The Ward Councilor, N. E. Cebekhulu, was contacted telephonically to discuss the project. An official notification was delivered to the Ward Councillor by hand on the 15th March 2017.
- A map showing the landowners included under Appendix D. Landowners were notified electronically, via email. Proof of notification is included under Appendix D.
- Signboards detailing the project were placed along P381 Road notifying local residents and businesses of the project.
- All relevant authorities and registered I & APs have been notified of the application and copies of the BAR provided.
- The Draft BAR was circulated for a legislated 30 day comment period.
- All comments received within the comment period have been included in Appendix G of the Final 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;*

Since the majority of pipeline will be placed in DoT road reserves, signboards were placed along the main road near the residential / business areas. An advert was also published in the Illanga. Email notifications to all I&APs were sent out on the 31st January 2017. 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);and*

An advert was placed in the Illanga local newspaper on the 05th February 2017 detailing the proposed project, Basic Assessment process and providing 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.

- 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. The copy of the original comments have been provided together with the Comments and Response Table. This report has been provided to the uMshwathi Local Municipality, uMgungundlovu District Municipality, the Department of Water & Sanitation and KZN Wildlife for comment.

See Appendix G – Comments and Response table and Comments received to date.

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 have 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 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 affect 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 Preferred Site and Layout Alternative

See Appendix H for the full impacts scoring matrix, which assesses the environmental impact of the New Hanover pipeline.

Table 1: Impacts and mitigation measures associated with the preferred layout

Nature and Consequences of impact	Significance rating of impacts ² :	Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:	Significance rating of impacts after mitigation:
Construction			
1. Dusty conditions generated during construction and by construction vehicles.	4 (low)	<p>Since the pipeline will be placed adjacent to gravel roads, there is unlikely to be a large amount of dust generated by the vehicles. There will however be some dust generated during the construction phase which will be a temporary impact 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"> • Water carts must be used on site should dust levels elevate to a nuisance level. • Water cart will be utilised to dampen dusty surfaces and suppress dust from road surfaces. • Shade cloth is to be utilised for stockpiled materials where required. <p>This impact can be managed and mitigated to a large degree with the implementation of the EMPr. The applicant must comply with the National Dust Regulations (Government Notice R827, 2013) with regards to dust levels produced on site.</p>	2 (low)
2. Generation of emissions from construction vehicles.	5 (low)	<p>Due to the rural location of the study site and the small scale of the project, emissions generated from construction vehicles will be negligible and are not expected to significantly affect the surrounding environment. Measures to reduce emissions have however been incorporated into the EMPr. All construction vehicles will however be fitted with the appropriate silencers and exhausts. This impact can be managed and mitigated.</p>	0 (low)
3. Impact on existing services i.e. power lines, water pipes, infrastructure, etc.	5 (low)	<p>As standard construction practice the engineer and contractor will identify all existing services that may be affected along the route prior to construction. Any infrastructure that is removed must be replaced and any damage caused from construction must be repaired. This impact can be managed and mitigated.</p>	1 (low)
4. Damage to properties, fencing and subsistence farming plots during laying of pipework.	5 (low)	<p>For the most part the pipeline will be laid within the road reserves however if any properties or crops are likely to be affected, the contractor will liaise with the</p>	2 (low)

² See Appendix H for more details.

Nature and Consequences of impact	Significance rating of impacts ² :	Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:	Significance rating of impacts after mitigation:
		<p>landowner. The pipeline trenches will be approximately 1m and 1m deep, thereby limiting the area of the excavation and damage that could be caused by large vehicles.</p> <p>This impact can be avoided and mitigated.</p>	
<p>5. Erosion of exposed soil prior to the rehabilitation of the construction area.</p>	<p>6 (med)</p>	<p>Exposed soil is very susceptible to erosion and therefore erosion control is critical, especially around the watercourse crossings. Exposed areas will be rehabilitated and re-vegetated as soon as possible during construction. Cleared areas may not be left exposed for long periods of time and should be re-vegetated in stages on completion of a section of the pipework. Small inspection holes may be left open along the route but the rest of the trench must be closed once the pipe has been laid.</p> <p>In certain steeper sections (northern section near reservoir) additional precautions to manage erosion will be required (e.g. sand bags or gabions).</p> <p>This impact is to be monitored during construction and can be mitigated.</p>	<p>2 (low)</p>
<p>6. Excavation of trenches resulting in large areas of land being cleared and at risk of erosion.</p>	<p>6 (med)</p>	<p>Only the minimum area required for the trench may be cleared. Trench size should not need to be more than 2m wide at most, therefore the most suitably sized equipment must be used to excavate the trench. It is recommended that the trenches be dug by hand to reduce unnecessary clearance and disturbance. As stated above, trenches are may not be left exposed for long periods of time and should be re-vegetated in stages on completion of a section of the pipework.</p> <p>This impact can be managed and mitigated.</p>	<p>2 (low)</p>
<p>7. Trenches remaining open for long periods of time, causing them to collapse, creating an erosion and safety hazard.</p>	<p>7 (med)</p>	<p>Trenches must not remain open indefinitely. Trench work must be completed in sections and then closed once the pipe has been laid in that section. Small inspection holes may be left open along the route but the rest of the trench must be closed. Cleared areas may not be left exposed for long periods of time and must be re-vegetated as each stage of pipework is completed. Trenches must not remain open during building shut down periods i.e. over Christmas and Easter. Trench work must be planned so that trenches are closed before these shut down periods as there is a risk that the trenches will either collapse or fill with water if left unattended and this can create a hazard for children and animals. Trenches must be demarcated.</p>	<p>2 (low)</p>

Nature and Consequences of impact	Significance rating of impacts ² :	Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:	Significance rating of impacts after mitigation:
		This impact can be avoided.	
8. Incorrect filling of trenches on completion creating points of erosion, especially on slopes and near watercourses.	6 (med)	<p>Care must be taken to ensure that when closing trenches, soil is compacted sufficiently and left so that the level of the trench is slightly higher than the surrounding land, to allow settling. Should soil settle below the level of the surrounding land, it will leave a depression along which water will travel and this could create a focal point for erosion. This can be especially problematic on sloped sections where water will follow the depression along the pipeline route, building up speed down steeper sections and creating furrows. If this occurs near the river crossings, it will erode the river banks and cause them to collapse. Rehabilitation through replanting of indigenous grass species soon after closure will aid in stabilising soil and preventing erosion and will also assist in dust control.</p> <p>This impact can be avoided and mitigated.</p>	4 (low)
9. Deposition of eroded material into water bodies when laying pipe across the watercourses impacting water quality (increased turbidity, reduction of dissolved oxygen).	7 (med)	<p>Caution needs to be exercised when working near the watercourse crossings (RC1 – RC4). The following mitigation measures will be carried out and are included in the EMP:</p> <ul style="list-style-type: none"> • All construction activities occurring within the watercourses must be done with extreme care to avoid damage to the watercourse and associated wetland area around RC3 and 4. • No heavy vehicles will be permitted to work in any watercourse unless exceptionally hard material is encountered and the trench cannot be dug by hand. Pipework around these sensitive areas should be laid by hand. • No storage of materials will be permitted within these areas or within 15m of these areas, which will be agreed on and demarcated before construction begins on each section. • Where stream crossings are required, the pipe will be encased in concrete to prevent movement during high flow events. The pipeline will be laid below the level of the river bed and gabions / reno-matresses will be used to prevent scouring of the river bed and exposure of the pipe. The gabions will be placed just downstream of the pipe and will be below the level of the river bed in order to maintain the river bed profile. • The contractor will ensure that stream bed work is carried out in the dry season when flow rates are low to non- 	3 (low)

Nature and Consequences of impact	Significance rating of impacts ² :	Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:	Significance rating of impacts after mitigation:
		<p>existent (i.e. June – August).</p> <ul style="list-style-type: none"> The Mvoti River will need to be temporarily diverted however if this is the case, a suitably qualified contractor will be appointed to handle the temporary stream diversion work to ensure that the flow rate and stream morphology are taken into account. In order to prevent long-term deposition of material into the watercourses, areas exposed to erosion must be protected through the use of sand bags, berms and efficient construction processes i.e.: limiting the extent (footprint) and duration period that areas are exposed. <p>This impact can be managed and mitigated to a degree.</p>	
10. Increased sedimentation due the temporary diversion of the Mvoti River.	8 (med)	<p>The construction of the pipeline within the Mvoti River requires a temporary diversion of the river within the river. Half the river will be diverted using sand bags so that the pipeline may be constructed.</p> <ul style="list-style-type: none"> Sand bags used are to be placed with care and securely so that movement of the sand bags can be prevented to avoid sedimentation into the stream. The flow dynamics is to be remain the same as before the temporary diversion. The decommissioning of the diversion is to be undertaken by suitably qualified contractor. 	3 (low)
11. Physical damage to wetland areas associated with the Mvoti River and tributaries during excavation.	8 (med)	<p>Construction activities are to be restricted to the pipeline route and construction camp area. The rest of the surrounding area must be demarcated as 'no-go areas' to prevent workers from unintentionally encroaching into wet areas. Furthermore:</p> <ul style="list-style-type: none"> There will be a temporary impact on the wetland around RC1 and 4 as material will be removed from the wetland. Soil must be removed in layers and stockpiled outside the wetland. As soon as the pipeline has been laid the soil must be replaced. The original soil layering must be maintained. Therefore no long term loss of wetland should occur. The pipeline is to run as close to all existing roads as possible to reduce the disturbance footprint. The pipe must be tied to existing structures at the watercourse, where feasible to reduce the amount of construction activities within the watercourse (e.g. RC4). 	5 (low)

Nature and Consequences of impact	Significance rating of impacts ² :	Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:	Significance rating of impacts after mitigation:
		<ul style="list-style-type: none"> • No storage of material, vehicles or equipment is permitted within the wetland areas; • No heavy vehicles will be permitted to work in the wetland areas unless exceptionally hard material is encountered and the trench cannot be dug by hand. Pipework around these sensitive areas should be laid by hand. • No dumping of material or waste may occur within these areas. All material and waste must be taken back to the construction camp at the end of the day. • Designated stockpile storage areas must be established outside of the wetland areas. <p>This impact can be managed during construction through the implementation of the EMP.</p>	
12. Clearing of indigenous vegetation during the laying of the pipeline and temporary access points.	5 (low)	<p>The majority of the pipeline will be placed in road reserves which means that the area has been previously disturbed. Vegetation associated with RC1-RC4 mainly consists of weeds due to previous construction activities.</p> <ul style="list-style-type: none"> • The relatively small trench size should result in the loss of only a narrow strip of vegetated area, which must then be revegetated on completion. • Clearing of vegetation and excavating of the trench in close proximity to the watercourses will need to be done by hand, where possible. Vehicle access will be restricted as there is a higher risk of damage and disturbance to surrounding vegetation. • Due to previous disturbance, the areas near the road tend to be more disturbed and invaded by alien species. Therefore where possible, the route will follow close to the road. • The contractor must ensure that invasive species do not gain a foothold along the cleared route until the indigenous vegetation has had time to re-establish. <p>This impact can be managed and mitigated.</p>	3 (low)
13. Construction within an area identified by KZNW as a Critical Biodiversity Area.	5 (low)	<p>Sections of the pipeline fall within the CBA, however no more than 300m² of indigenous vegetation will be removed as the pipeline is to be placed within the road reserve.</p> <ul style="list-style-type: none"> • The impact is expected to be low or no 	3 (low)

Nature and Consequences of impact	Significance rating of impacts ² :	Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:	Significance rating of impacts after mitigation:
		impact. <ul style="list-style-type: none"> The vegetation in the area has been transformed by the sugarcane farms in the area. The removal vegetation will not have an impact on the biodiversity of the area. This impact has been avoided.	
14. Encroachment of alien vegetation into disturbed areas during construction.	5 (low)	Alien vegetation and weeds were noted near all river crossings due to previous disturbance associated with construction of roads and stormwater infrastructure. <ul style="list-style-type: none"> Alien vegetation within the construction footprint must not be allowed to encroach onto the site and must be continually removed during construction. This impact can be managed and mitigated.	3 (low)
15. Loss of riparian vegetation during excavation for pipework crossings on watercourses, leading to erosion and damage to stream banks.	5 (low)	Where clearing of riparian vegetation is required, it will be kept to a minimum due to the small size of the pipe and associated trench. The key impact that requires attention is the potential for erosion, which is to be monitored by the Contractor on an ongoing basis. Erosion can be reduced by keeping any vegetation associated with the watercourses intact. This impact can be avoided and managed.	3 (low)
16. Temporary increase in waste and litter due to the construction process.	6 (med)	The construction phase of the project will see an increase in workers on site and therefore an increase in waste in the area. <ul style="list-style-type: none"> Littering will not be permitted in the study area; Designated waste storage areas with appropriate waste receptacles must be set up within the construction site camp; Waste will be removed from site and disposed of at a registered waste disposal site; Safe disposal slips for the disposal of all waste must be obtained and kept on site as proof of safe disposal. Waste management will be controlled through the implementation of the EMP. This impact can be managed and mitigated.	2 (low)
17. Insufficient number of toilet facilities on site resulting in the contamination of the environment.	6 (med)	The increase of construction personnel during the construction phase will require an appropriate number of toilet facilities for the site. <ul style="list-style-type: none"> Appropriate and sufficient toilet facilities (1 toilet per 15 employees) must be provided by the contractor; All toilet facilities must be checked on a daily basis; 	2 (low)

Nature and Consequences of impact	Significance rating of impacts ² :	Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:	Significance rating of impacts after mitigation:
		<ul style="list-style-type: none"> • All toilet facilities must be emptied and cleaned on a weekly basis. • A registered waste removal contractor must remove effluent waste from site or effluent waste must be disposed of at a permitted Waste Water Treatment Site; • Safe disposal slips for the disposal of effluent waste must be obtained and kept on site as proof of safe disposal. <p>This impact can be managed and mitigated.</p>	
<p>18. Contamination of the receiving environment due to inappropriate storage and usage of hazardous materials and substances (cement, fuel etc.).</p>	<p>6 (med)</p>	<p>It is unlikely that there will be many hazardous materials used during construction however any potentially hazardous substances (including cement and paint) will be stored within a secured area in the construction camp. No storage of material is to occur within 32m of any watercourse. The storage area will be a hard surfaced, bunded and covered area. Cement mixing must be done on a hard surface that is protected from stormwater runoff.</p> <p>This impact can be prevented by managing the storage.</p>	<p>2 (low)</p>
<p>19. Construction vehicles and personnel creating a nuisance to the surrounding area and businesses.</p>	<p>5 (low)</p>	<p>The centre section of the pipeline runs near the centre of the small town. The work area is to be designated to prevent trespassing onto adjacent farms. Speed limits will be obeyed and enforced by the contractor. A complaints register will be kept on site in the environmental file.</p> <p>This impact can be avoided and managed.</p>	<p>3 (low)</p>
Operation			
<p>20. Upgrading of the bulk water supply to the local area.</p>	<p>0</p>	<p>This is a positive impact.</p>	<p>0</p>
<p>21. Erosion around watercourses and damage to watercourse banks where pipe crossings have been placed.</p>	<p>8 (med)</p>	<p>Since the pipeline will be placed under the bed of the watercourses, it is unlikely to cause a long-term erosion impact. Where watercourses have been crossed, a concrete block will be constructed in the river bank to anchor the pipeline in place during high flow conditions. Gabions / reno mattresses may be included in the design to stabilize the banks and prevent erosion of the banks during high flow events. It must also be ensured that trench rehabilitation has been effectively carried out before contractors leave the site. Soil in the trenches must be compacted effectively to the same level or slightly higher than the surrounding land to prevent settling which could create depressions for water to travel along, creating erosion funnels and exposing the pipeline. It must be ensured that indigenous vegetation is planted after the</p>	<p>4 (low)</p>

Nature and Consequences of impact	Significance rating of impacts ² :	Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:	Significance rating of impacts after mitigation:
		soil has been compacted and that this vegetation has taken successfully before contractors leave the site. This impact can be avoided during the construction phase.	
22.Placement of pipes in the beds of watercourses impacting the flow regime of the Mvoti River.	6 (med)	Due to the small size of the pipes and tributaries as well as the placement of the pipeline underneath the bed of the watercourses, the construction will not impact the flow regime of the Mvoti River. The pipes will be tied to existing structures, where possible or placed underneath the stream bed. Please refer to drawing in Appendix A. This impact can be prevented during the construction phase.	2 (low)
23.Water pipes bursting resulting in localised flooding and erosion.	6 (med)	The design criteria was developed using guidelines from “The Red Book – The Human Settlement, Planning and Design”. Various measures to ensure pipe integrity will be implemented including: <ul style="list-style-type: none"> • Scour valves to control the supply of water. They are used to stop supply when any repairs are carried out on a section of pipeline. • Non-Return Valves (spring loaded) will be placed along the pipeline length which effectively break the line into smaller sections thereby decreasing the overpressures. These valves have been designed for placement on long pump mains (over and above the mandatory placing at pump stations). Double purpose (RBX) air valves would be installed either side of the valve. • Vacuum Breaker / Air Release Valves designed to accommodate air intake and release during normal operation and in the event that the pump trips or the line is being filled or scoured. These valves will be installed at apexes along the pipelines at distances of not more than 600m and also before and after isolation valves and non-return valves. This impact can be prevented and mitigated.	1 (low)
24.Illegal connections resulting in damage to pipework, flooding, erosion and loss of water supply.	6 (med)	Due to the location of the pipeline, it is unlikely that illegal connections will be made however the pipeline will be laid in such a way so as to deter illegal connections. The bulk pipelines will be encased in a steel layer to make it difficult to puncture. This impact can be prevented and managed.	3 (low)
Decommissioning			

Nature and Consequences of impact	Significance rating of impacts ² :	Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:	Significance rating of impacts after mitigation:
25. Rubble, soil and material left on site and in close proximity to the watercourses.	5 (low)	It is unlikely that the pipeline and reservoir will be decommissioned however should this be required, all rubble and pipework area to be removed from the site and disposed of at a registered landfill site. Where the pipe is removed from the watercourses, the trench is to be filled with stones and rehabilitated to its current condition to prevent pooling in this section. This impact can be managed and mitigated.	1 (low)
Cumulative			
26. General pollution and sedimentation within the catchment.	8 (med)	Provided that the Contractor is compliant with the measures included in the attached EMP, waste management and erosion control will be sufficiently managed to prevent this cumulative impact.	4 (low)
27. Improved service delivery to the local area.	0	This is a positive impact.	0

6.3 Environmental Impact Statement as per section (l)

The key impacts associated with the Greater Efaye Secondary Bulk Water Pipeline and Reservoir relate to those during the construction period. Issues such as indigenous vegetation clearing, physical damage to the watercourses and wetlands and managing erosion need to be addressed by the contractor. This can be best managed by demarcating the area requiring clearing (i.e. width of the trench), treating the watercourses as sensitive areas where no vehicles are allowed to excavate near and implementing effective erosion control measures at the crossings (i.e. gabions or reno-matresses). All construction activity is to be confined to the side of existing roads and servitudes where possible. All vehicles must use the existing roads and operate within the existing route. No ad hoc roads/ turning circles may be used.

Once construction is complete there should be no significant impacts related to the operation of the water pipeline. Taking into consideration the above impacts and mitigation measures, it is the EAP's opinion that the Greater Efaye Secondary Bulk Water Pipeline and Reservoir be authorised, as per the layout in Appendix A.

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, specifically within the watercourse.
 - To practice responsible construction, 'best practice' with regards to housekeeping on site during construction (outlined within the EMP) and enforce the polluter pays principle. The applicant / 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 information in this report is based on findings of the aquatic and wetland assessments. The design drawings and typical cross sections through the watercourses, have been provided to the EAP by the engineer. The EAP is therefore satisfied that there are no gaps in knowledge relating to this assessment.

6.6 Period for Which Authorization is Required, Proposed Monitoring & Auditing and Post Construction Requirement's

Environmental authorisation is required for the construction of the water scheme towards the middle / end of 2017. It is therefore recommended that the authorization be valid for a period of five 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.

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)

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

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

Impacts associated with the construction and operation of the pipeline have been rated as 'low' after mitigation (see Table 1 above) however the following conditions are recommended for inclusion in the authorisation:

Stakeholders, Properties & Services

- As standard construction practice the engineer and contractor should identify all existing services that may be affected prior to construction.
- It is suggested that any structures that need to be removed, should be replaced and any damage repaired.
- The route should run adjacent to existing roads and existing services wherever feasible.

Traffic & Construction Vehicles

- Appropriate signage and trench demarcation must be used to cordon off construction areas.
- All construction vehicles should be fitted with the appropriate silencers and exhausts.
- Speed limits must be obeyed.
- Existing roads must be used with no ad hoc roads being created.

Housekeeping, waste management, storage and materials handling

- Littering must not be permitted on site.
- All hazardous materials and substances should be stored within a secured area in the construction camp. The storage area should be a hard surfaced, bunded and covered area.
- Cement mixing must be done on a hard surface that is protected from stormwater runoff.
- Appropriate and sufficient toilet facilities must be provided by the contractor.
- Toilet facilities must be provided by a registered company and all sewage must be disposed of at an appropriate facility. Safe disposal certificates must be kept on record.
- Toilet facilities must not be located within 32m of any watercourses.

Dust and erosion control

- A water cart should be available to dampen dusty surfaces and suppress dust, if necessary.
- Exposed areas should be rehabilitated and re-vegetated as soon as possible during construction.
- Areas exposed to erosion must be protected through the use of sand bags, berms and efficient construction processes i.e.: limiting the extent (footprint) and duration period that areas are exposed.

Stormwater management and protection of watercourses

- The engineer/contractor must ensure that only clean stormwater runoff enters the environment. Any contaminated run off must be collected and disposed of.
- All watercourses must be identified and demarcated at the start of construction.
- No excavated material or fill material may be stored within or directly adjacent to the watercourses.
- Only the area directly in the path of the trench may be cleared of vegetation.
- The contractor must ensure that invasive species do not gain a foothold along the cleared route until the indigenous vegetation has had time to re-establish itself.

- Heavy vehicles should avoid working near the watercourses as much as possible. Trenches to preferably be dug by hand.
- Once construction is complete, it must be ensured that no material whatsoever is left in the stream channels or near the banks where it may be washed into the watercourses in a high flood event. It is recommended this material be removed from site entirely if it is not used in the construction process.

Trenching

- Only the minimum area required for the trench may be cleared.
- Trenches must not remain open indefinitely.
- Trench work must be completed in sections and then closed once the pipe has been laid in that section.
- Cleared areas may not be left exposed for long periods of time and must be re-vegetated at each stage of pipework is completed.
- Trenches must not remain open during building shut down periods i.e. over Christmas and Easter.
- Soil in the trenches must be compacted effectively to the same level or higher than the surrounding land to prevent settling which could create depressions for water to travel along, creating erosion funnels and exposing the pipeline.
- Indigenous grasses must be replanted after the soil has been compacted and that this vegetation has taken successfully before contractors leave the site.
- Trench rehabilitation must be effectively carried out before contractors leave the site, especially where approaching the watercourse crossings and on steeper hills.

Watercourse crossings

- Work in stream beds should preferably be carried out during winter when flow rates are lower.
- Erosion protection features must be installed at the watercourse crossings if there are no existing structures.
- Pipework must be laid in the river bed flush with the bedrock or the stream bed so as not to create a point for erosion.

Protection of Heritage Resources

- Attention is drawn to the South African Heritage Resources Act, 1999 and the KwaZulu-Natal Heritage Act which, requires that operations that expose archaeological or historical remains should cease immediately, pending evaluation by the provincial heritage agency.

Appendix A: Engineering Drawings & Maps

Appendix B: Specialist Reports

Appendix C: Proof of Placement of Notice Board

Appendix D: Proof of Notification

Appendix E: Advert

Appendix F: Registered I &Aps

Appendix G: Comments and Response Table and Comments Received

Appendix H: Impacts Scoring Matrix

Appendix I: EAP declaration and Curriculum Vitae

Appendix J: Environmental Management Program