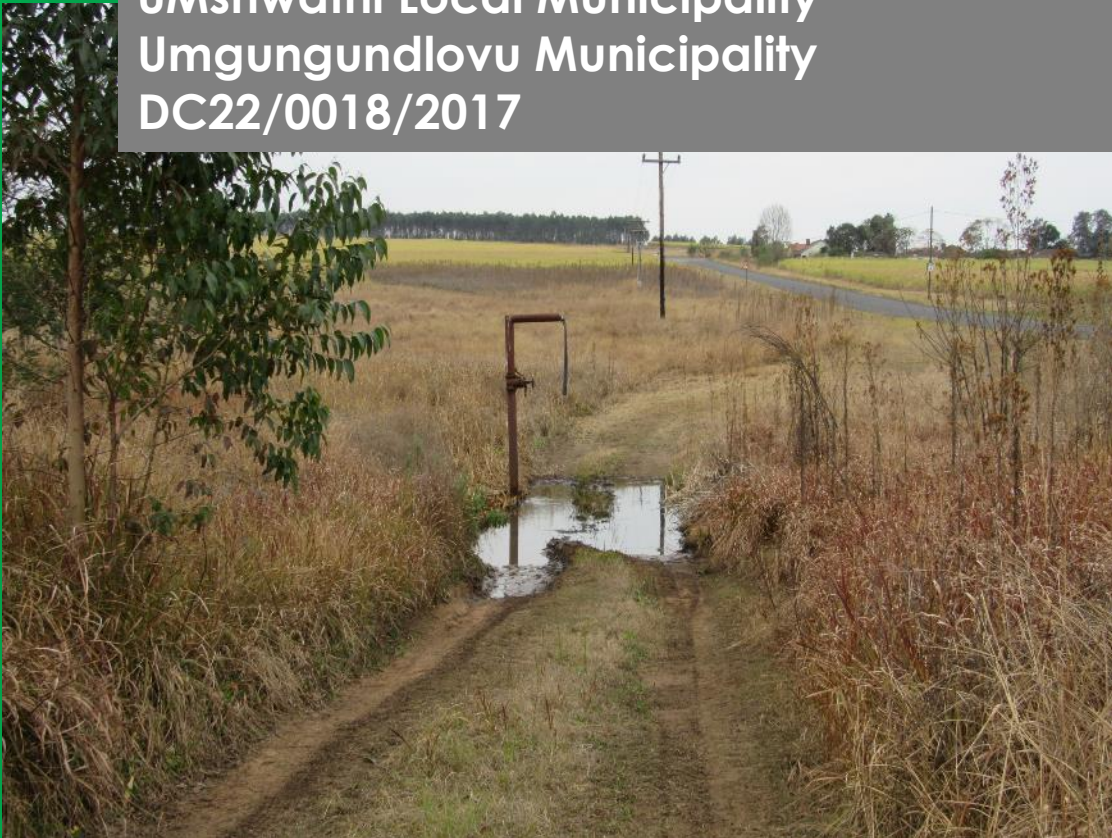


March  
2017



**DRAFT Basic Assessment Report  
New Hanover Secondary Bulk Water Pipeline & Reservoir  
uMshwathi Local Municipality  
Umgungundlovu Municipality  
DC22/0018/2017**



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EVP539

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

3 (1) (a) details of (i) the EAP who prepared the report; and (ii) the expertise of the EAP. Please see Appendix I for EAP Declaration and full Curriculum Vitae;

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## Executive Summary

The uMgungundlovu Municipality propose to construct the New Hanover Secondary Bulk Water Pipeline and Reservoir as part of Phase 2 of the uMshwathi Bulk Water Scheme. The project involves the construction of a 7.6km x 160mm diameter bulk water pipeline and a 0.5Ml concrete reservoir. The pipeline is located to the south of New Hanover town and east of Trust Feed within Ward 9 of the uMshwathi Local Municipality. The pipelines will supply a reliable source of potable water during the anticipated expansion of the area.

The majority of the pipeline will run in road reserves however the pipeline will cross underneath the Mhlalane River once (WC1). It will also cross tributaries of this river at two locations (WC2 & WC3). This will result in the excavation and deposition of material into watercourses, triggering a Basic Assessment process. The pipeline will be encased with steel and will be run under the watercourse (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 watercourse 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 pipes within the watercourse will be laid below the level of the river bed and encased in concrete. Concrete anchors will be used to keep the pipe in place during high flow events. 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 across the watercourse, 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. It also runs directly adjacent to the Umgeni Water pipeline, but in a separate servitude. 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 for future expansion of the area. 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

New Hanover Secondary Bulk Water Pipeline and Reservoir 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 New Hanover Secondary Bulk Water Pipeline and Reservoir within Ward 9 of the uMshwathi Local Municipality. The new 160mm bulk pipeline will tie into an existing bulk water pipeline in Wartburg and connect to a proposed new 0.5MI concrete reservoir, 7.6 km north of this tie-in point. There is currently a small municipal reservoir supplying the immediate area. The new bulk pipeline and new reservoir will increase the supply capacity in preparation for future expansion expected to the south of New Hanover town. The existing reticulation will not be upgraded at this stage.

The bulk pipeline will be placed in trenches approximately 1m wide and less than 1m deep. The pipeline will be encased with steel to prevent leaks and theft of the pipes during operation. Figures 1 and 2 illustrate the locality of the proposed pipeline route and maps showing details of the watercourse crossings are provided in Appendix A of the report.

As far as possible, the new pipeline has been aligned alongside existing roads. A large section of the pipeline will run parallel to the new Umgeni Water pipeline (i.e. at WC1) but will be positioned in a separate municipal servitude. The pipeline will be placed underneath the railway line using directional drilling. Where the pipeline crosses a watercourse, it will be placed underground within a concrete pipe encasement. The pipeline will cross the Mhlalane River. It will also cross tributaries of this river at two locations. Each watercourse crossing has wetland area associated with it. The crossings have been labelled WC1, WC2 & WC3 throughout the report.

The watercourse crossings will result in the infilling / excavation of more than 5m<sup>3</sup> 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 New Hanover 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 pipe specifications and reservoir need to fall within the appropriate designs standards.

See Appendix A for Engineering Drawings.

#### The No Go Alternative

The construction of the New Hanover bulk pipeline and 0.5MI reservoir will not occur and the existing bulk 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 983 Listing Notice 1; 04 <sup>th</sup> December 2014 | 19.             | <i>(i):The infilling or depositing of any material of more than 5 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 -<br/>(i) A watercourse</i> | The pipeline crosses the Mhlalane River and tributaries of this river in three locations (WC1 – WC3). The pipes will be encased with steel and placed underground, underneath the watercourses. The excavations to allow pipes to be placed underground will result in more than 5m <sup>3</sup> of material being removed and deposited within the various watercourses. |



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

|  |                             |                                      |                      |
|--|-----------------------------|--------------------------------------|----------------------|
| <b>District Municipality</b>                                       |                             | Umgungundlovu District Municipality. |                      |
| <b>Local Municipality</b>  |                             | uMshwathi Local Municipality.        |                      |
| <b>Ward</b>  |                             | 9                                    |                      |
| <b>Area / Town / Village</b>                                       |                             | New Hanover                          |                      |
| <b>Co-ordinates:</b>   |                             | <b>Latitude</b>                      | <b>Longitude</b>     |
|  | <b>Pipeline Start point</b> | 29°25'16.24"S                        | 30°34'10.76"E        |
|  | <b>Pipeline End point</b>   | 29°22'12.42"S                        | 30°32'39.01"E        |
|  | <b>New Reservoir</b>        | 29°22'12.42"S                        | 30°32'39.01"E        |
| Mhlalane River & Associated Floodplain Wetland                     | <b>WC 1</b>                 | 29°23'15.06"S                        | 30°33'49.77"E        |
| Tributary of the Mhlalane River & Associated Valley-Bottom Wetland | <b>WC 2</b>                 | 29°22'38.17"S                        | 30°33'22.48"E        |
| Mhlalane River & Associated Channelled Valley-Bottom Wetland       | <b>WC 3</b>                 | 29°22'37.42"S                        | 30°33'8.69"E         |
| <b>Property Description:</b>                                       |                             | <b>Parent Farm:</b>                  | <b>Farm Portion:</b> |
|  |                             | Doorn Kop 983                        | 182                  |
|  |                             | Doorn Kop 983                        | 172                  |
|  |                             | Doorn Kop 983                        | 135                  |
|  |                             | Doorn Kop 983                        | 70                   |
|  |                             | Doorn Kop 983                        | 17                   |
| <b>21 Digit Surveyor General's numbers:</b>                        |                             | NOFT00000000098300182                |                      |
|  |                             | NOFT00000000098300172                |                      |
|  |                             | NOFT00000000098300135                |                      |
|  |                             | NOFT00000000098300070                |                      |
|  |                             | NOFT00000000098300017                |                      |

Figure 1: 1:50 000 Topographical Map Showing the New Hanover Pipeline in Red (source: PlanetGIS, 2017)










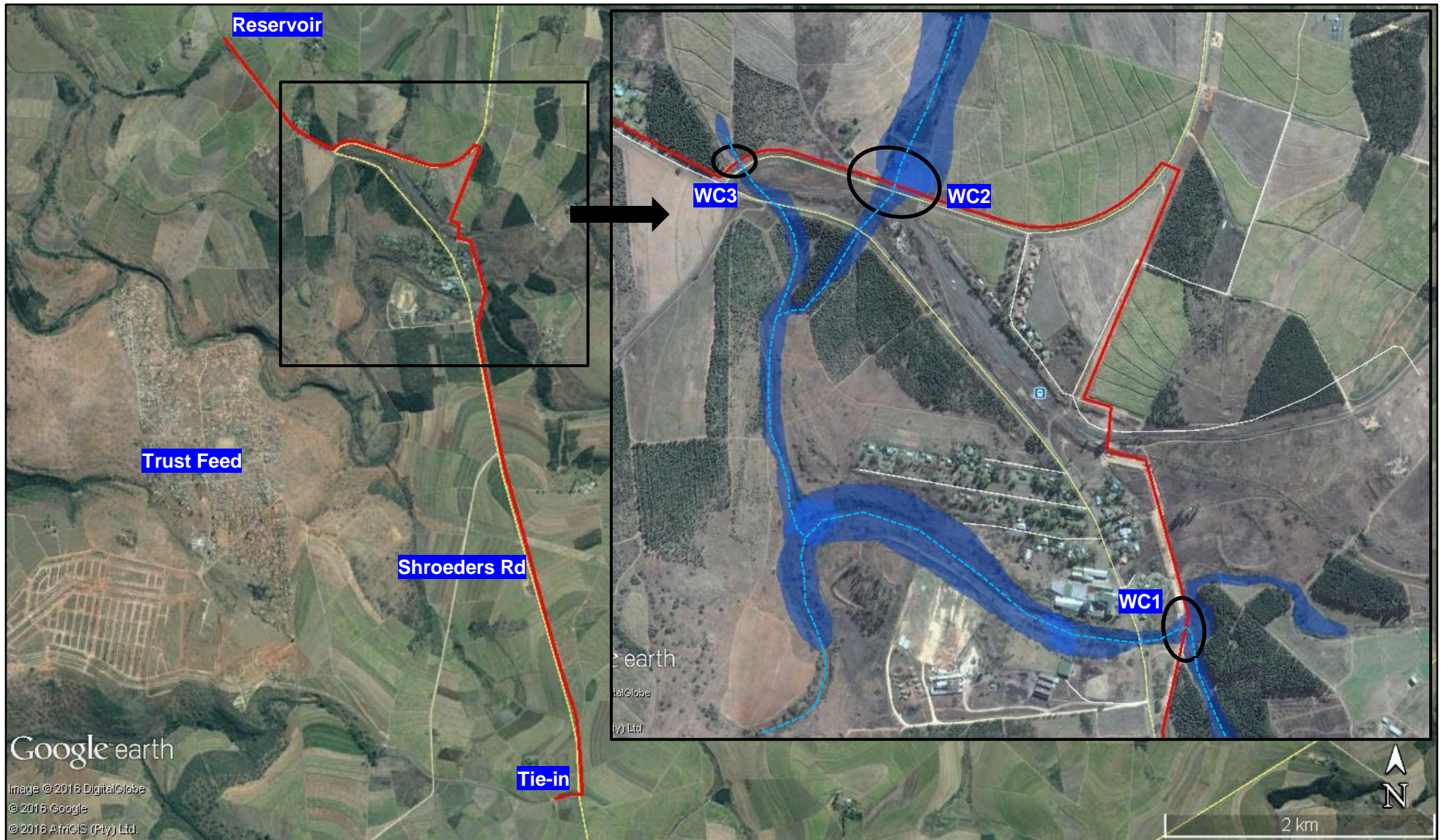
|                                |                                  |   |             |  |
|--------------------------------|----------------------------------|---|-------------|--|
| <b>Title</b>                   | New Hanover Pipeline & Reservoir | <b>Legend</b>   |             | <br>Cell: 082 568 3687<br>E-mail: josette@enviropro.co.za<br>Cell: 082 887 4362<br>E-mail: iain@enviropro.co.za<br>Phone: 031 765 2942<br>Fax: 086 549 0342 |
| <b>Co-ordinates</b>            | 29°22'38.17"S; 30°33'22.48"E     |  | Watercourse |  |
| <b>Scale</b>                   | 1:50 000                         |  | Wetland     |  |
| <b>Topographical Sheet No.</b> | 2930BC                           |  | Plantations |  |
| <b>Drawing No.</b>             | New Hanover #01                  |  | Contour     |  |
| <b>Date Prepared</b>           | 27 <sup>th</sup> January 2017    |  | Pipeline    |  |
| <b>Prepared By</b>             | Stephanie Denison                |  | Urban Areas |  |



Figure 2: Aerial Photograph Showing an Overview of the Proposed New Hanover Pipeline (red) and Associated Watercourses Drawn in Blue. Delineated wetland areas are 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 and reservoir consists of sugarcane farms and a small urban area. The pipeline runs underneath the Transnet railway line at one location, near Shroeders Train Station. The project area is located at an elevation of approximately 1000m above mean sea level. The gradient drops steadily from the tie-in point near Wartburg in the south (920m) to the proposed reservoir site (840m) in the north of the study site. Photographs taken within the study area that show the surrounding topography are included in Figure 3.

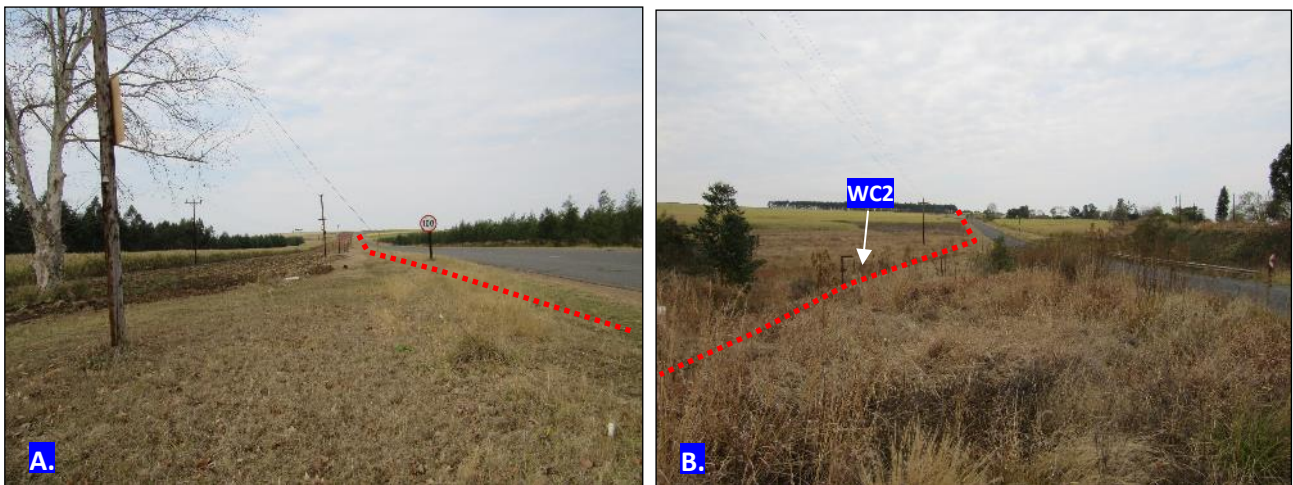
The gradient of the site is as follows:

| Gradient           | Description   |
|--------------------|---|
| <b>Flat</b>        | There are areas of the study area where the gradient flattens out completely.                                       |
| <b>1:50 – 1:20</b> | The gradient increases slightly from Wartburg to the proposed new reservoir site, to the north of the project area. |
| 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 follows:

| Topographical Feature             | Description   |
|-----------------------------------|---|
| Ridgeline                         | N/A   |
| Plateau                           | N/A   |
| Side slope of hill/mountain       | N/A   |
| Closed valley                     | N/A   |
| Open valley                       | N/A   |
| Plain                             | N/A   |
| <b>Undulating plain/low hills</b> | The gradient associated with the pipeline route is very gentle with low undulating hills dominating 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 southern portion of the project area where the pipeline will run parallel to Schroeders Road; **(b)** Photograph of the northern portion of the pipeline where it runs along the P154, near WC2.

## 2.2 Surface Water and Ground Water

New Hanover is located within the U20F 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 to the aquatic system and visible disturbances are significant (section 3.1 of the Aquatic Assessment). Due to these activities the system is regarded as largely modified (Class D) by the aquatic specialist (Appendix B).

The pipeline crosses the main channel of the Mhlalane River at 29°23'15.06"S; 30°33'49.77"E (Figure 4). The aquatic ecosystem of the Mhlalane River associated with WC1 was characterized by the aquatic specialist as "very slow flow with most of the river being covered by aquatic macrophytes" (section 3.1 of the Aquatic Assessment in Appendix B).

Two smaller tributaries of the Mhlalane River are crossed by the pipeline at WC2 (29°22'38.17"S; 30°33'22.48"E) and WC3 (29°22'37.42"S; 30°33'8.69"E). The P154 and a dirt farm road intersect the perennial watercourse at WC2. The informal dirt road is being used to access a water pump. The watercourse at WC3 is non-perennial. Water only flows in the drainage line after there has been rainfall in the area. Photographs showing the condition of the watercourses at WC2 and WC3 are provided in Figures 5 and 6 below respectively.

Most of the pipeline will be placed underground, within the road reserve of Schroeders Road and the P154 however the middle section will lie adjacent to the Umgeni Pipeline in a separate municipal servitude. 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. Two concrete blocks will be placed on either side of the river bed to anchor the pipe and prevent damage to the steel sleeve during high rainfall events.

**Figure 4: Photographs Showing the Conditions of the Watercourse at WC1**



**(a):** Upstream of WC1 **(b):** Downstream of WC1 **(c):** Umgeni Water bulk pipeline currently under construction across the Mhlalane River during the time of the site inspection in August 2016.

**Figure 5: Photographs Showing the Conditions of the Watercourse at WC2**



**(a):** Overview of WC2 adjacent to the P154 **(b):** Upstream of WC2 where the watercourse opens out into a valley-bottom wetland **(c):** Blue dotted line showing the location of the watercourse as it flows underneath the P154 towards the main Mhlalane River.



**Figure 6: Photographs Showing the Conditions of the Watercourse at WC3**

**(a):** Non-perennial drainage line crossed at WC3 **(b):** Existing pipe underneath the P154 at WC3 **(c):** Downstream view at WC3 looking towards Schroeders Road.

### 2.2.1 Wetlands

The Wetland Assessment carried out by The Biodiversity Company in August 2016, found that there were no National Freshwater Ecosystem Priority Areas (NFEPA) within 500m of the pipeline. However, during the site visit, wetland was found to be associated with all three watercourse crossings (shaded in blue in Figure 2 above).

The wetlands identified have been moderately impacted upon by the development of infrastructure and the large scale sugarcane farming (section 6.1 of the Wetland Assessment). A floodplain wetland is associated with WC1. Channelled and unchannelled valley-bottom wetlands were found to be associated with WC2 and a channelled valley-bottom wetland was identified at WC3.

The wetland systems were determined to be in a modified state owing to impacts that are imposed on these systems (section 6.2 of the Wetland Assessment). The biggest impacts were the alteration of the local catchment for the sugarcane farming practices which has led to loss of marginal wetland areas and vegetation, which has altered the hydrological cycle of the wetland areas and causing erosion. The sugarcane farming has impacted on the hydrology of the wetland by altering the surface roughness and increasing surface flow velocities. The large dominance of the *Phragmites australis* plant suggests that the wetland areas are disturbed and natural vegetation has been largely replaced by this plant. 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 Wetland Assessment in Appendix B).

### 2.3 Fauna and Flora

The site is located within a rural area which is dominated by extensive sugarcane farming. The vegetation within the study area is described as follows:

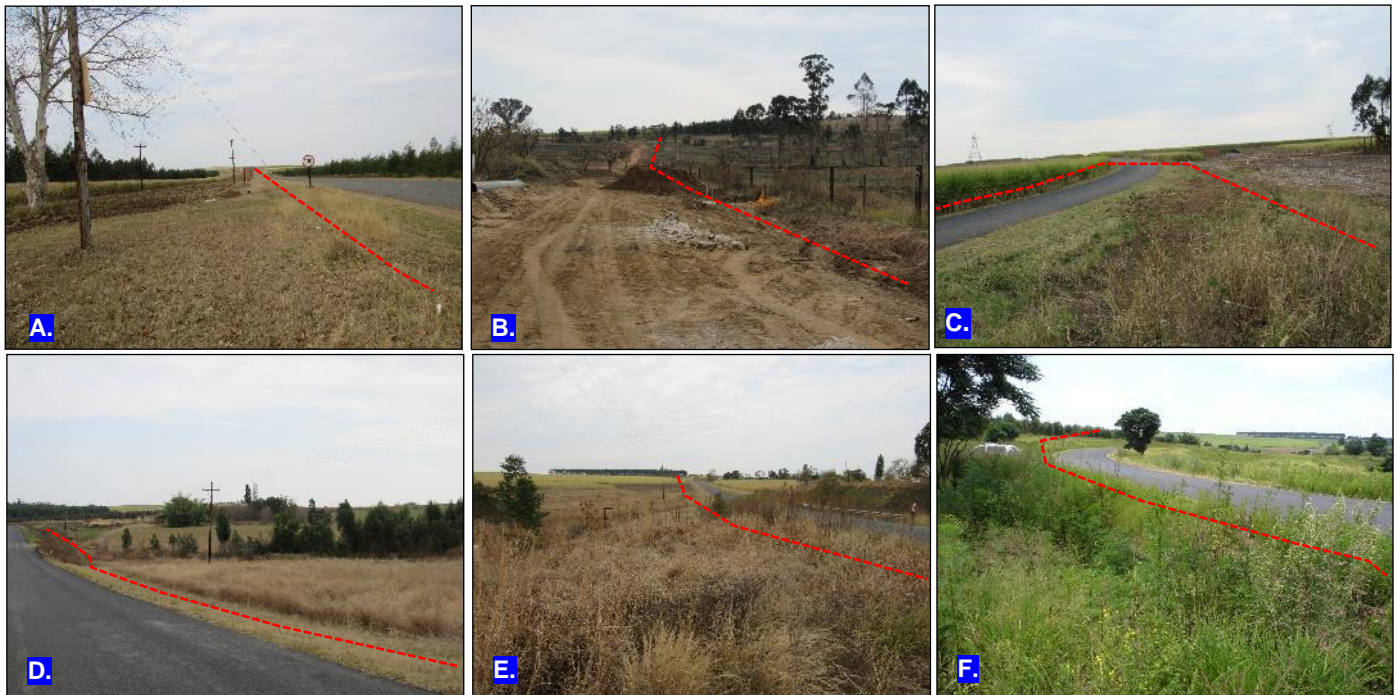
- Ecosystem Type: Ngongoni Veld
  - This ecosystem has been identified by the South African National Biodiversity Institute (SANBI) as “vulnerable”.
  - Dense, tall grassland overwhelmingly dominated by unpalatable, wiry Ngongoni grass (*Aristida juniciformis*), with this monodominance associated with low species diversity.
  - Only 1% of the unit is statutorily conserved in the Opathe and Vernon Crookes Nature Reserves. Some 39% has been transformed for cultivation, plantations and urban development.
- Vegetation noted on site (Figure 7):
  - The first 3.8km of pipeline from Wartburg to WC1 is located with the Schroeders Road reserve within sugarcane fields on either side of the road. There will be no clearing of indigenous vegetation.
  - The next 900m follow the existing Umgeni Water Pipeline, through WC1 and underneath the railway line. The vegetation in this area is highly disturbed by previous construction activities and existing infrastructure (roads, railway line etc.).



- The next 1.3km runs within dirt road reserves as well as the P154 Road Reserve. There are sugarcane fields on either side of the road and therefore there will be no clearance of indigenous vegetation.
- The vegetation associated with WC2 and WC3 is highly disturbed and dominated by weeds (see Figure 7e & f); however there will be some removal of indigenous vegetation (less than 1 hectare).

The pipeline has been aligned to follow existing roads and servitudes 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 Schroeders Road reserve **(b):** Disturbed area associated with the Umgeni Pipeline near WC1 **(c):** Vegetation in the northern portion of the pipeline route where the road joins the P154 Road reserve **(d):** Vegetation associated with the P154 Road reserve. Photographer facing west **(e):** Grassland associated with WC2. Photographer facing east towards WC2 **(f):** Disturbed vegetation associated with WC3.

## 2.4 Heritage and Cultural Aspects

A Heritage Impact Assessment was carried out to determine if there were any significant heritage or cultural aspects associated with the pipeline route (attaches under Appendix B). The specialist concluded that “although the area is potentially rich in Iron Age and Stone Age sites no heritage sites or features were observed on the footprint. The area is also not part of any known cultural landscape”. Since the pipeline will be placed in areas previously disturbed by construction activities (i.e. roads, railway lines, farming and servitudes), it is not anticipated that there is 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 39km east of Pietermaritzburg. The surrounding land uses include small rural towns and large scale sugarcane farming (section 4 of the Wetland Assessment). 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 reservoir are described as follows:

- Located within a rural area south-east of New Hanover town and north-east of Trust Feed.
- The area is totally surrounded by sugarcane fields with pockets of timber farming.
- There are light industrial activities and residential houses to the west of the pipeline route.
- The pipeline will pass underneath the railway on one occasion.

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                            | 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. 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. Environmental authorisation is required for the construction of the bulk water pipeline across the various watercourses. This application is therefore in line with the requirements of NEMA. |
| National Water Act 1998   | 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 the watercourses 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.   |
| National Waste Management Act 2008                                    | Reforms the law regulating waste management to prevent pollution and ecological degradation. 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.   |
| Environmental Conservation Act 1996                                   | 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.  |
| National Environmental Management Biodiversity Act 2004               | 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 entire pipeline falls within Ngongoni Veld, listed as a vulnerable ecosystem.   |
| National Heritage Resources Act 25 of 1999                            | 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.   |
| <b>Municipal Planning Framework</b>                                   |  |
| Umgungundlovu Municipality Integrated Development Framework 2015/2016 | 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.   |

## Section 4: Motivation, Need and Desirability

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

The New Hanover Secondary Bulk Water Pipeline and reservoir site is part of the Umshwathi Bulk Water Scheme (Phase 2). The bulk pipeline will supply the new, larger proposed reservoir along Schroeders Road with potable water. This area, south of New Hanover has been earmarked for future expansion and development. 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 reservoir in the New Hanover area and therefore there are no site alternatives. Since the pipeline follows existing roads and the Umgeni Water bulk pipeline servitude, 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 designs standards.

The three watercourse 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 New Hanover 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 31<sup>st</sup> January 2017. The noticeboard detailed uMgungundlovu Municipality's proposed plan to construct the bulk water pipeline and reservoir, 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 31<sup>st</sup> January 2017.
- The Ward Councilor, Mr Mbongwe, was contacted telephonically on the 27<sup>th</sup> January 2017 to discuss the project. An official email notification was sent on the 31<sup>st</sup> January to the Ward Councilor.
- A map showing the landowners is included under Appendix D. Landowners were notified electronically, via email and notices hand delivered depending on the contact information available from the Deeds Office. Proof of notification is included under Appendix D.
- Signboards detailing the project were placed along Schroeders 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 *Ilanga*. Email notifications to all I&APs were sent out on the 31<sup>st</sup> 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 *Ilanga* local newspaper on the 05<sup>th</sup> 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 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<br>1 = short term / once off<br>2 = medium term / during operation<br>3 = long term / permanent                                    |
| Geographical Extent                                       | 0 = No impact<br>1 = point of impact / restricted to site<br>2 = local / surrounding area<br>3 = regional  |
| Severity (level of damage caused) if impact were to occur | 0 = No impact<br>1 = minor<br>3 = medium<br>5 = major  |
| Probability of impact without mitigation                  | 1 - 5 = low.<br>6 -10 = medium.<br>11 -14 = high.  |
| Significance before application of Mitigation Measures    | A score of between 1 and 5 is rated as low.<br>A score of between 6 and 10 is rated as medium.<br>A score of between 11 and 14 is rated as high. |
| Will activity cause irreplaceable loss of resources?      | 10 = Yes<br>0 = No   |
| Mitigation measures                                       | 0 = No impact<br>- 5 = can be fully mitigated<br>- 3 = can be partially mitigated<br>-1 = unable to be mitigated                                 |
| Probability of impact after mitigation                    | 0 = No impact<br>1 = Low<br>2 = Medium<br>3 = High   |
| Significance after application of Mitigation Measures     | A score of between 1 and 5 is rated as low.<br>A score of between 6 and 10 is rated as medium.<br>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 <sup>1</sup> : | Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:   | Significance rating of impacts after mitigation: |
|---|---|---|--|
| <b>Construction</b>   |   |   |  |
| 1. Dusty conditions generated during construction and by construction vehicles.           | 4 (low)                                       | <p>Since the pipeline will be placed adjacent to tar 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"> <li>• Water carts must be used on site should dust levels elevate to a nuisance level.</li> <li>• Water cart will be utilised to dampen dusty surfaces and suppress dust from road surfaces.</li> <li>• Shade cloth is to be utilised for stockpiled materials where required.</li> </ul> <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 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>   | 2 (low)  |

<sup>1</sup> See Appendix H for more details.

| Nature and Consequences of impact  | Significance rating of impacts <sup>1</sup> : | 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 and mitigated.  |  |
| 5. Erosion of exposed soil prior to the rehabilitation of the construction area.                                       | 6 (med)                                       | 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. In certain steeper sections (northern section near reservoir) additional precautions to manage erosion will be required (e.g. sand bags or gabions). This impact is to be monitored during construction and can be mitigated.   | 2 (low)  |
| 6. Excavation of trenches resulting in large areas of land being cleared and at risk of erosion.                       | 6 (med)                                       | 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. This impact can be managed and mitigated.  | 2 (low)  |
| 7. Trenches remaining open for long periods of time, causing them to collapse, creating an erosion and safety hazard.  | 7 (med)                                       | 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. This impact can be avoided. | 2 (low)  |
| 8. Incorrect filling of trenches on completion creating points of erosion, especially on slopes and near watercourses. | 6 (med)                                       | 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   | 4 (low)  |

| Nature and Consequences of impact  | Significance rating of impacts <sup>1</sup> : | Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:  | Significance rating of impacts after mitigation: |
|--|---|--|--|
|  |   | <p>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 watercourses, 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>   |  |
| <p>9. Deposition of eroded material into water bodies when laying pipe across the watercourses impacting water quality (increased turbidity, reduction of dissolved oxygen).</p> | <p>7 (med)</p>                                | <p>Caution needs to be exercised when working near the watercourse crossings (WC1 – WC3). The following mitigation measures will be carried out and are included in the EMP:</p> <ul style="list-style-type: none"> <li>• All construction activities occurring within the watercourses must be done with extreme care to avoid damage to the watercourse and associated wetland area.</li> <li>• 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.</li> <li>• 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.</li> <li>• 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 (see typical section through the river crossing attached under Appendix A).</li> <li>• The contractor will ensure that stream bed work is carried out in the dry season when flow rates are low to non-existent (i.e. June – August).</li> <li>• It is unlikely that any stream 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</li> </ul> | <p>3 (low)</p>                                   |



| Nature and Consequences of impact   | Significance rating of impacts <sup>1</sup> : | Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:  | Significance rating of impacts after mitigation: |
|---|---|--|--|
|   |   | <p>ensure that the flow rate and stream morphology are taken into account.</p> <ul style="list-style-type: none"> <li>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.</li> </ul> <p>This impact can be managed and mitigated to a degree.</p>  |  |
| <p>10. Physical damage to wetland areas associated with the Mhlalane River and tributaries during excavation.</p> | <p>8 (med)</p>                                | <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"> <li>The pipeline is to run as close to all existing roads as possible to reduce the disturbance footprint.</li> <li>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. WC2).</li> <li>No storage of material, vehicles or equipment is permitted within the wetland areas;</li> <li>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.</li> <li>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.</li> <li>Designated stockpile storage areas must be established outside of the wetland areas.</li> </ul> <p>This impact can be managed during construction through the implementation of the EMP.</p> | <p>5 (low)</p>                                   |
| <p>11. Clearing of indigenous vegetation during the laying of the pipeline and temporary access points.</p>       | <p>5 (low)</p>                                | <p>The majority of the pipeline will be placed in road reserves and adjacent to existing servitudes which means that the area has been previously disturbed. All vegetation associated with WC1 has already been removed due to the laying of the Umgeni Water Pipeline. Vegetation associated with WC2 and 3 mainly consists of weeds due to previous construction activities.</p> <ul style="list-style-type: none"> <li>The relatively small trench size should result in the loss of only a narrow strip</li> </ul>  | <p>3 (low)</p>                                   |

| Nature and Consequences of impact  | Significance rating of impacts <sup>1</sup> : | Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:  | Significance rating of impacts after mitigation: |
|--|---|--|--|
|  |   | <p>of vegetated area, which must then be revegetated on completion.</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• 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.</li> <li>• 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.</li> </ul> <p>This impact can be managed and mitigated.</p> |  |
| 12. Encroachment of alien vegetation into disturbed areas during construction.   | 5 (low)                                       | <p>Alien vegetation and weeds were noted near all watercourse crossings due to previous disturbance associated with construction of roads and stormwater infrastructure.</p> <ul style="list-style-type: none"> <li>• Alien vegetation within the construction footprint must not be allowed to encroach onto the site and must be continually removed during construction.</li> </ul> <p>This impact can be managed and mitigated.</p>  | 3 (low)  |
| 13. Loss of riparian vegetation during excavation for pipework crossings on watercourses, leading to erosion and damage to stream banks. | 5 (low)                                       | <p>All watercourses are already crossed by roads or services, which have previously disturbed and transformed the watercourses. Furthermore, the drainage lines have little riparian vegetation due to recent clearing for the Umgeni Water pipeline (WC1) and the non-perennial nature of the tributaries at WC2 and WC3. 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.</p> <p>This impact can be avoided and managed.</p>  | 3 (low)  |
| 14. Temporary increase in waste and litter due to the construction process.  | 6 (med)                                       | <p>The construction phase of the project will see an increase in workers on site and therefore an increase in waste in the area.</p> <ul style="list-style-type: none"> <li>• Littering will not be permitted in the study area;</li> <li>• Designated waste storage areas with appropriate waste receptacles must</li> </ul>  | 2 (low)  |

| Nature and Consequences of impact  | Significance rating of impacts <sup>1</sup> : | Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:  | Significance rating of impacts after mitigation: |
|--|---|--|--|
|  |   | be set up within the construction site camp; <ul style="list-style-type: none"> <li>Waste will be removed from 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> Waste management will be controlled through the implementation of the EMP. This impact can be managed and mitigated.   |  |
| 15. 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"> <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 on a daily basis;</li> <li>All toilet facilities must be emptied and cleaned on a weekly basis.</li> <li>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;</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> This impact can be managed and mitigated. | 2 (low)  |
| 16. Contamination of the receiving environment due to inappropriate storage and usage of hazardous materials and substances (cement, fuel etc.). | 6 (med)                                       | 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. This impact can be prevented by managing the storage.   | 2 (low)  |
| 17. Construction vehicles and personnel creating a nuisance to the surrounding area and businesses.  | 5 (low)                                       | 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. This impact can be avoided and managed.   | 3 (low)  |
| <b>Operation</b>   |   |  |  |
| 18. Upgrading of the bulk water supply to the local area.  | 0   | This is a positive impact.   | 0  |

| Nature and Consequences of impact  | Significance rating of impacts <sup>1</sup> : | Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:  | Significance rating of impacts after mitigation: |
|--|---|--|--|
| 19. Erosion around watercourses and damage to watercourse banks where pipe crossings have been placed. | 8 (med)                                       | <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 soil has been compacted and that this vegetation has taken successfully before contractors leave the site.</p> <p>This impact can be avoided during the construction phase.</p> | 4 (low)  |
| 20. Placement of pipes in the beds of watercourses impacting the flow regime of the Mhlalane River.    | 6 (med)                                       | <p>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 Mhlalane River. The pipes will be tied to existing structures, where possible or placed underneath the stream bed. Please refer to drawing in Appendix A.</p> <p>This impact can be prevented during the construction phase.</p>  | 2 (low)  |
| 21. Water pipes bursting resulting in localised flooding and erosion.                                  | 6 (med)                                       | <p>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:</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• 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.</li> <li>• Vacuum Breaker / Air Release Valves designed to accommodate air intake</li> </ul>   | 1 (low)  |



| Nature and Consequences of impact  | Significance rating of impacts <sup>1</sup> : | Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:  | Significance rating of impacts after mitigation: |
|--|---|--|--|
|  |   | 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.<br>This impact can be prevented and mitigated.  |  |
| 22. 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 an 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.<br>This impact can be prevented and managed.  | 3 (low)  |
| <b>Decommissioning</b>   |   |  |  |
| 23. 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.<br>This impact can be managed and mitigated. | 1 (low)  |
| <b>Cumulative</b>  |   |  |  |
| 24. 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)  |
| 25. Improved service delivery to the local area.   | 0   | This is a positive impact.   | 0  |

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

The key impacts associated with the New Hanover 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 New Hanover 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 EMPr) 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**