

TITLE:

ENVIRONMENTAL BASIC ASSESSMENT REPORT FOR THE PROPOSED NORTHERN
AQUEDUCT AUGMENTATION **PHASE 4** – DURBAN, KWAZULU-NATAL

KNIGHT PIESOLD JOB NO.:

303-00213.03/2

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SYNOPSIS:




This BAR considers the probable impacts on the receiving environment of the proposed development.

EIA Number: DM / 0065 / 2012

KEY WORDS:

Basic Assessment Report, Pipeline, Northern Aqueduct Augmentation, Phase 4, NAA Ph 4, Existing Northern Aqueduct, Durban,
Phoenix 2, Duffs Road, 1.2m Diameter pipe

REPORT ISSUE & REVIEW:

Verification	Capacity	Name	Signature	Date
By Author	Environmental Scientists	Compiled By: Michelle Lotz Updated By: Deepa Seepersad		May 2013
Checked by	Environmental Scientist	Tamryn Manzoni Johnson		May 2013
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KZN Agriculture, Environmental Affairs & Rural Development

umNyango: ezoLimo ezeMvelo nokuThuthukiswa

kweMiphakathi yaseMakhaya

ISIFUNDAZWE SAKWAZULU-NATALI

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Basic Assessment Report in terms of the **Environmental Impact Assessment Regulations, 2010** promulgated in terms of the **National Environmental Management Act, 1998 (Act No. 107 of 1998)**

Kindly note that:

1. This **basic assessment report** meets the requirements of the EIA Regulations, 2010 and is meant to streamline applications. This report is the format prescribed by the KZN Department of Agriculture, Environmental Affairs and Rural Development. Please make sure that this is the latest version.
2. The report must be typed within the spaces provided in the form. The size of the spaces provided is not indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with text.
3. Where required, place a cross in the box you select.
4. An incomplete report will be returned to the applicant for revision.
5. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it will result in the rejection of the application as provided for in the regulations.
6. No faxed or e-mailed reports will be accepted.
7. The report must be compiled by an independent environmental assessment practitioner ("EAP").
8. Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.
9. The KZN Department of Agriculture, Environmental Affairs and Rural Development may require that for specified types of activities in defined situations only parts of this report need to be completed.
10. The EAP must submit this basic assessment report for comment to all relevant State departments that administer a law relating to a matter affecting the environment. This provision is in accordance with Section 24 O (2) of the National Environmental Management Act 1998 (Act 107 of 1998) and such comments must be submitted within 40 days of such a request.
11. **Please note** that this report must be handed in or posted to the District Office of the KZN Department of Agriculture, Environmental Affairs and Rural Development to which the application has been allocated (please refer to the details provided in the letter of acknowledgement for this application).

SECTION A: DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER AND SPECIALISTS

1. NAME AND CONTACT DETAILS OF ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

Name and contact details of the EAP who prepared this report:

Business name of EAP:	<i>Knight Piesold Consulting</i>		
Physical address:	<i>2nd Floor, Engen House, 171 Rodger Sishi Road (Blair Atholl Drive), Westville North</i>		
Postal address:	<i>PO Box 383, Durban, KZN</i>		
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2. NAMES AND EXPERTISE OF REPRESENTATIVES OF THE EAP

Names and details of the expertise of each representative of the EAP involved in the preparation of this report:

Name of representative of the EAP	Education qualifications	Professional affiliations	Experience at environmental assessments (yrs)
Michelle Lotz	<i>B.Sc. (Botany and Zoology) University of Natal, Pietermaritzburg (1991-1993) B.Sc. (Honours) (Ecology) University of Natal (1994) M.Sc. (Ecology) University of Natal (Part Time) (1996-2001)</i>	<i>Pr.Sci.Nat. - Registered with the South African Council for Natural Scientific Professions: Professional Natural Scientist (Environmental Science) Registration Number: 400 253/04 IAIAsa - Member of the International Association for Impact Assessors South Africa</i>	15 years
Deepa Seepersad	<i>B.Sc. (cum laude), University of KwaZulu-Natal, Durban (2002-2004) B.Sc. (Hons) Environmental Science, University of KwaZulu-Natal (2007)</i>	<i>Cand.Sci.Nat. - Registered with the South African Council for Natural Scientific Professions: Professional Natural Scientist (Environmental Science) Registration Number: 100031/11 IAIAsa - Member of the International Association for Impact Assessors South Africa</i>	4 years

3. NAMES AND EXPERTISE OF SPECIALISTS

Names and details of the expertise of each specialist that has contributed to this report:

Name of specialist	Education qualifications	Field of expertise	Section/ s contributed to in this basic assessment report	Title of specialist report/ s as attached in Appendix D
<i>Dr James Edmund Granger</i>	<i>BSc, BSc (Hons), PhD</i>	<i>Ecology</i>	<i>Biodiversity</i>	<i>A Basic Assessment of the Plant Communities intersected by Phase 4 of the Northern Aqueduct Augmentation (NAA PH4) and a Brief account of their possible roles in determining biodiversity</i>
<i>Gavin Anderson</i>	<i>B.A.(Soc.Sci), B.A.(Hons) in Archaeology, M. Phil in Archaeology/Social</i>	<i>Archaeology</i>	<i>Cultural and Historic Features</i>	<i>Desktop Survey of the Proposed Northern Aqueduct Augmentation, Phase 4, KwaZulu-Natal</i>

	<i>Psychology</i>			
<i>Dr Jeanne Tarrant</i>	<i>PhD</i>	<i>Herpetology</i>	<i>Biodiversity</i>	<i>Frog Specialist Report for Wetland Areas adjacent to Eastbury drive and possible impacts of Phase 4 of the Northern Aqueduct Augmentation: Determining the presence of the critically endangered Pickersgill's Reed Frog, <i>Hyperolius pickersgilli</i>.</i>
<i>Mbaweni Manqele</i>	<i>M.Ed (Environmental Education)</i>	<i>Public Participation</i>	<i>Public Participation Process</i>	<i>Report on Basic Assessment Study, Public Participation</i>
<i>Claire Blanche</i>	<i>BSc (Hons) MEnvDev</i>	<i>Environmental Management</i>	<i>External Reviewer</i>	<i>Review of Basic Assessment process and Related Reports</i>

SECTION B: ACTIVITY INFORMATION

1. PROJECT TITLE

Describe the project title as provided on the application form for environmental authorization:

*Environmental Basic Assessment Report for the Proposed Northern Aqueduct Augmentation **Phase 4**, Durban, Kwazulu-Natal*

2. PROJECT DESCRIPTION

Provide a detailed description of the project:

EThekweni Water and Sanitation (EWS) is currently in the process of constructing a new bulk water pipeline from Cato Ridge to Inchanga, Pinetown, Tshelimnyama and Ntuzuma (and surrounds) with gravity-fed potable water (The Western Aqueduct (WA)). The pipeline ties into Umgeni Water's existing bulk water infrastructure beyond the municipal boundary, which receives potable water from the Midmar Dam system. The pipeline currently under construction consists of a steel pipe of varying diameters (1.6m – 0.6m). Construction of Phase 1 of the WA has been completed, but construction of Ph2 of the WA is on hold.

Application was made to the Department of Environmental Affairs, and a positive Record of Decision received, for the Northern Aqueduct Augmentation (NAA), which will inject water from the WA into the NAA system via an off-take at KwaDabeka. This will involve the construction of a new bulk water pipeline from Emachobeni to Umhlanga via the proposed Blackburn Reservoir, supplying areas north of the Umgeni River, south of the Ohlanga River and east of Ntuzuma (and surrounds) with gravity-fed potable water. The 50km pipeline recently authorised, will consist of a steel pipe of varying diameters, and will be named the 'Northern Aqueduct Augmentation'.

Phase 4, which is now being proposed, is named NAA Phase 3 by the engineers (for reasons un-necessary to describe here). Currently, there is an existing Northern Aqueduct (NAX), which will be augmented by the NAA. Once completed, Phase 1 of the NAA project will provide an important link between the existing NAX and the new developments in the north including Cornubia, Umhlanga, Waterloo and Nyaninga. The NAX however, is presently operating very close to its maximum capacity and does not have spare capacity to supply the new developments such as Cornubia. The problem, when the new demands are tagged onto the end of the system, is the high velocities that will occur in the trunk mains running from Durban Heights to Phoenix 2 Reservoir via Duffs Road. This in turn results in high friction losses and inadequate flow through the system.

The most severe bottleneck in the existing NAX occurs in the section of trunk mains between Duffs Road and Phoenix 2 (linking the NAX to the NAA Phase1). This section of the existing system consists of a 525mm diameter pipe in parallel with a 450mm pipe between Duffs Road and the Phoenix 1 off-take and thereafter, a 450mm pipe in parallel with a 375mm pipe up to Phoenix 2 Reservoir. These pipelines are completely inadequate for the purposes of providing a water supply into the NA Phase 1.

Because the construction of the WA (Phase 2) has been put on hold, an alternative link (NAA Phase 4 [also known as NAA Phase 3 by the Engineers and, which will hereinafter be referred to as NAA Phase 4]) is currently being proposed. This is to provide water from the EXISTING NAX into NAA Phase 1, so that Cornubia and other developments in the north of Durban, can be provided with water within the next 18 months, as the construction of the WA Ph2 will only reach the starting point of the NAA Ph2 (at Emachobeni) in five years time (optimistically).

*It is thus proposed that a new 1.2m pipe be laid in parallel with the existing pipelines (to remove the bottleneck in the system) **between Duffs Road and Phoenix 2 Reservoir**. This pipeline forms Phase 4 (See Diagram below) of the NAA and is required to be commissioned at the same time as NAA Ph 1, i.e. 2014.*

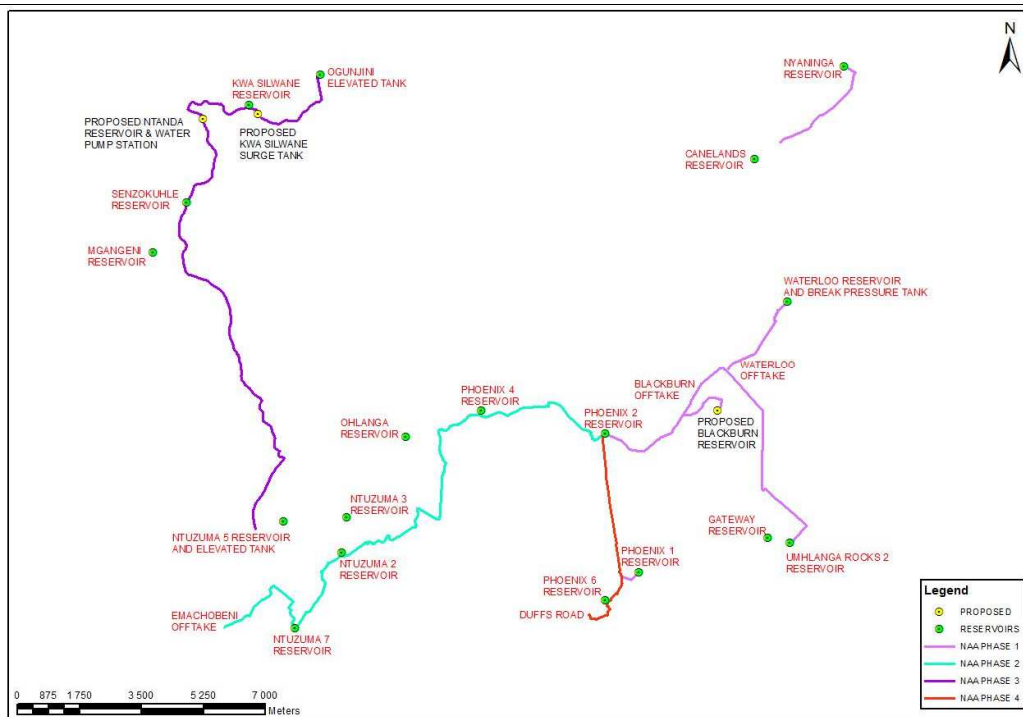


Figure 1: Phases of the Northern Aqueduct Augmentation Project (Phase 4 is in the colour red)

The existing two pipes within the servitude will continue to be used (current daily volume approximately 50,000m³). The proposed bigger pipe will merely augment the existing pipelines, which are presently a bottleneck in the system. The old pipes are much smaller (450 – 500mm) in diameter, and as such when the new pipe is tied into the system, the water will prefer the path of least resistance, and thus most of it, will 'choose' the bigger pipe. The ultimate 30-year demand in the system will result in a total flow of about 120,000 m³ per day, of which 100,000 m³ per day will flow in the proposed (bigger) pipe as a result of its lower friction loss.

Description of NAA Phase 4 Route:

The proposed Northern Aqueduct Augmentation Phase 4 is approximately 5.5km in length. The pipeline will be 1.2m in diameter. Refer to the Mapbook Key Plan and relevant Sheet Maps in Appendix A for the following descriptions:

Sheet 1: The proposed new section of NAA Phase 4 starts on the western bank of the Umhlangane River, between Cumnick Ndlovu Highway and the R102, at an off-take from the existing NAX (which also crosses the Umhlangane River, a few hundred metres to the north of the proposed NAA Ph4 crossing point). The NAX crosses this river up a steep bank along the existing servitude, and between townhouses and adjacent low cost housing in Mount Moriah. The proposed crossing point of the NAA Ph4 is further south, up a shallower bank, and along Mount Moriah Drive. This section of the route has been amended from the existing NAX route in order to avoid the steep bank traversed by the NAX. This route option will also allow residents access to their homes during construction via alternative routes, i.e. residents will not be prevented from accessing their homes by vehicle at any stage during construction.

Sheet 2: The proposed route then turns left (north) into Simunye Avenue, and then turns right (north east) at the junction with Eleka Road into the open veld (servitude), crossing an existing watercourse and the Str 121359 ring road (an off-shoot of Mount Moriah Drive), twice. The Phoenix 6 reservoir is located to the west of the proposed route, just prior crossing Str 121359. This servitude is shared with the NAX water trunk main and eThekweni Electricity Overhead lines. A number of watercourses and areas of market gardening are traversed within this servitude. The proposed route then crosses Str 122309 before heading off into a northerly direction.

Sheet 3: The proposed route crosses Str 122323 and then a large open space (designated for housing development), before crossing a steep bank and denser vegetation on the outskirts of Phoenix. The Phoenix 1 reservoir is located to the east of this open space. The proposed route (within the existing servitude) crosses Stonebridge Drive and then runs alongside Bush Road in a northerly direction.

- **Offtake to the Phoenix 1 Reservoir:** Having crossed Str 122323, the proposed pipeline link to the Phoenix 1 Reservoir will branch off and head east along the boundary of ERF 989, before turning left, in a north eastern direction towards the Phoenix 1 Reservoir.

Sheet 4: The servitude passes alongside (west of) Bush Road, crosses Eastwood Road, and then passes east of Burnhill Close in Phoenix. It then traverses a small open space south of Parkmead Avenue, crosses Parkmead, adjacent to Rainbird Close, crosses Greenbury Drive, into

an open space, just before Rainhill Close.

Sheet 5: The route then continues in a northerly direction, passes west of a cricket oval (still within the servitude), and crosses the circular Cardinal Road twice. It passes between Longbridge Walk and Portbridge Place, (through open space) under Phoenix Highway, and east of Roseclay Place (also in open space (servitude)), and west of a sportsfield.

Sheet 6: The route passes Catford Crescent to the east, still within the servitude, crosses Clayfield Drive, in the area of Clayfield. Continuing along the servitude, it passes under the railway line, a petronet servitude, and the under Eastbury Drive, again crossing into open space, and through a watercourse. The proposed pipeline then traverses a fairly steep bank and across Longbury Drive.

Sheet 7: After Longbury Drive, the route continues northerly, within the servitude, passing Uppercliff Road to the east, through some denser vegetation, across Ridgecroft Drive, and across Wynbury Circle (twice).

Sheet 8: The route passes over Northbury Avenue, alongside Cliffbury Place to the west, and Heathbury Place to the east, touches on the terminal points of Edgebury Road and Brigbury Place, before coming to an end on the southern side of Phoenix Highway, opposite Phoenix 2 reservoir.

Reasons for undertaking a Basic Environmental Assessment and not a full EIA:

The transfer of such a large volume of water triggers a full EIA, however, considering the short length of the pipeline (5.5km), the fact that it mostly runs within an existing servitude, the few number of directly impacted IAPs and, by all appearances, few areas of extreme environmental (or biodiversity) concern, the environmental assessment would be well served in a basic assessment; a full EIA is therefore, not deemed necessary. A full EIA for the NAA has also recently been conducted in very close proximity to this area, and did not reveal many significant issues or comments from IAPs. Nevertheless, the Department of Environmental Affairs may request a full EIA at any interval, should they decide that the project is not being effectively served by the Basic Assessment.

The DAEARD has agreed to this course of action in a written letter dated 31st of January 2013, Knight Piésold Consulting will undertake the environmental application process to determine any possible biophysical or socio-economic impacts or issues, which will include a brief Public Participation Process (as this has been previously undertaken already). The PPP will be undertaken by separate specialists, Duyaze Environmental Consulting.

Alternatives along the proposed route:

The proposed pipeline route follows the existing electrical servitude as far as practicably possible. Due to the built up nature of the surrounding project area, this was the most appropriate route identified for the proposed pipeline from an engineering perspective, and which would have the least environmental and social implications. However, along various sections of the pipeline route, four site deviations or alternatives to the proposed route have been identified taking into consideration social, environmental and technical concerns. The no-go alternative has also been considered. The assessment of these alternatives have been described in detail in Section 4 of this Basic Environmental Assessment Report and the Route Option Analysis Report, which is found under Appendix G. The potential environmental and social impacts for each alternative remain the same as the proposed pipeline route.

3. ACTIVITY DESCRIPTION

Describe each listed activity in Listing Notice 1 (GNR 544, 18 June 2010) or Listing Notice 3 (GNR 546, 18 June 2010) which is being applied for as per the project description:

EIA Regulation	No.	Notice Description	Activity Description
EIA Regulation No R 544 (Listing Notice 1)	9	The construction of facilities or infrastructure exceeding 1000 metres in length for the bulk transportation of water, sewage or storm water (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more excluding where: a. such facilities or infrastructure are for bulk transportation of water, sewage or storm water or storm water drainage inside a road reserve; or b. where such construction will occur within urban areas but further than 32 metres from a watercourse, measured from the edge of the watercourse.	5.5km of 1.2m diameter bulk water pipeline installation, within road servitude in places, through urban area, and in some places within 32m of a watercourse. The throughput of the pipeline will exceed 120 litres per second. This includes the pipe-yards, construction yards, reservoirs, pump stations, cathodic protection, access roads, spoil areas, and scour valves and outlets.

	11	The construction of: (xi) infrastructure or structures covering 50 square metres or more Where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.	NAA Ph 4 is proposed to be laid across the Umhlangane River. The proposed project will also traverse various smaller watercourses and wetlands en-route.
	18	The infilling or deposition of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock or more than 5 cubic metres from: (i) Watercourse	NAA Ph 4 is proposed to be laid across the Umhlangane River. The proposed project will also traverse various smaller watercourses and wetlands en-route. A large trench will be required to bury the 1.2m diameter pipe below water level.
	37	The expansion of facilities or infrastructure for the bulk transportation of water, sewerage or storm water where: a) The facility or infrastructure is expanded by more than 1000m in length; or b) where the throughput capacity of the facility or infrastructure will be increased by 10% or more – excluding where such expansion: i) relates to transportation of water, sewerage or storm water within a road reserve; or ii) where such expansion will occur in urban areas but further than 32m from a watercourse, measured from the edge of the watercourse.	The development could be construed as 'Expansion' OR 'Construction'. There will be a new 1.2m pipe, but this will be augmenting the existing pipeline over the 5.5km, within road servitude in places, through urban areas, and in some places within 32m of a watercourse. The throughput of the pipeline will exceed 120 litres per second. This includes the pipe-yards, construction yards, reservoirs, pump stations, cathodic protection, access roads, spoil areas, and scour valves and outlets.
EIA Regulation No R 545 (Listing Notice 2)	10	The construction of facilities or infrastructure for the transfer of 50,000 cubic metres or more water per day, from or to any combination below: <ul style="list-style-type: none"> Water catchments Water treatment works Impoundments Excluding treatment works where water is to be treated for drinking purposes.	The new pipeline will transfer 100,000m ³ of water per day between water impoundments. The overall flow will increase by 60,000m ³ , but because water will choose the path of least resistance, the new, bigger pipe, will carry the bulk of this water, which amounts to 100,000m ³ of water between Durban Heights and Phoenix 2 Reservoirs.

4. FEASIBLE AND REASONABLE ALTERNATIVES

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

- the property on which or location where it is proposed to undertake the activity,
- the type of activity to be undertaken,
- the design or layout of the activity,
- the technology to be used in the activity,
- the operational aspects of the activity, and
- the option of not implementing the activity.

Describe alternatives that are considered in this report. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. The determination of whether site or activity (including different processes etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

Description of alternatives

Only one Site Alternative (S1) has been proposed, which follows the existing electrical servitude as far as practicably possible. Due to the built up nature of the surrounding project area, this was the most appropriate route identified for the proposed pipeline from an engineering perspective, and which would have the least environmental and social implications. However, along various sections of the pipeline route, four site deviations or alternatives to the proposed route have been identified taking into consideration social, environmental and technical concerns:

- **Alternative S1 – Only route (preferred) alternative with additional alternatives for various sections of the pipeline indicated on:**
 - **Mapbook Sheet 1: crossing of the Piesang River and adjacent Eleka Road:**
 - A1: preferred alternative route
 - A2: original proposed route.
 - **Mapbook Sheet 2: along Street 122309 and Street 122318:**
 - A1: preferred alternative route
 - A2: original proposed route.
 - **Mapbook Sheet 3: link between Duff Road and Phoenix 1 Reservoirs:**
 - A1: preferred alternative route
 - A2: original proposed route.
 - **Mapbook Sheet 6: Eastbury Drive Wetland:**
 - A1: preferred alternative route
 - A2: original proposed route
 - A3: revised proposed route.

The no-go alternative has also been considered. The NAX is presently operating very close to its maximum capacity and does not have spare capacity to supply the new developments such as Cornubia therefore, the no-go alternative would not meet the needs of the future demand for water supply in these new developments. This situation will continue if the no-go alternative is taken. The potential environmental and social impacts for each alternative remain the same as the proposed pipeline route.

The assessment of these alternatives have been described in detail in Section 4 of this Basic Environmental Assessment Report and the Route Option Analysis Report, which is found under Appendix G.

Sections B 5 – 15 below should be completed for each alternative.

5. ACTIVITY POSITION

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees, minutes and seconds. List alternative sites were applicable.

Alternative:

Alternative S1¹ (preferred or only site alternative)

Alternative S1² (preferred or only site alternative)

Latitude (S): **Longitude (E):**

N/A
N/A

In the case of linear activities: 5.5km Linear Pipeline Route

Alternative:

Alternative S1 (preferred or only route alternative)

- Starting point of the activity
- Middle point of the activity
- End point of the activity

Latitude (S): **Longitude (E):**

29°44'39.32"S ; 31° 00'43.02"E
29°43'22.98"S ; 31°01'10.47"E
29°41'52.90"S ; 31° 00'58.81"E

For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 500m along the route for each alternative alignment.

6. PHYSICAL SIZE OF THE ACTIVITY

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

¹ "Alternative S.." refer to site alternatives.

² "Alternative S.." refer to site alternatives.

Alternative:
Alternative A1³

Size of the activity:

N/A

or, for linear activities:

Alternative S1:

Alternative S1 (preferred activity alternative)

Pipeline

Length of the activity:

5.5km

Mapbook Sheet 1 – Alternatives:

Alternative A1 (preferred activity alternative)

Alternative A2

Length of the activity:

982.64 m

680.64 m

Mapbook Sheet 2 – Alternatives:

Alternative A1 (preferred activity alternative)

Alternative A2

Length of the activity:

945.05m

869.53m

Mapbook Sheet 3 – Alternatives:

Alternative A1 (preferred activity alternative)

Alternative A2

Length of the activity:

1403.71m

761.82 m

Mapbook Sheet 4 – Alternatives:

Alternative A1 (preferred activity alternative)

Length of the activity:

849.72m

Mapbook Sheet 5 – Alternatives:

Alternative A1 (preferred activity alternative)

Length of the activity:

790.59m

Mapbook Sheet 6 – Alternatives:

Alternative A1 (preferred activity alternative)

Alternative A2 (original proposed route – yellow route- alternative report)

Alternative A3 (revised proposed route – blue route- alternative report)

Length of the activity:

1129.37m

753m

2038.94m

Mapbook Sheet 7 – Alternatives:

Alternative A1 (preferred activity alternative)

Length of the activity:

362.53m

Mapbook Sheet 8 – Alternatives:

Alternative A1 (preferred activity alternative)

Length of the activity:

524.36m

**** Please note these are approximate lengths**

Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):

The proposed Phase 4 Pipeline will be laid within an existing electrical servitude which has a width of 50m. Within the existing electrical servitude, the pipeline will be confined to a 20m workspace (inclusive of working corridor and pipeline servitude).

Amendments through road reserve: The pipeline working space will be confined to the road reserve in the amendments proposed.

Sensitive environments: The pipeline working space will be confined to a 15m or reduced further near the Eastbury Drive Wetland and riparian crossings along the route.

Alternative S1:

Size of the site/servitude:

³ "Alternative A.." refer to activity, process, technology or other alternatives.

Alternative S1 (preferred activity alternative)		20m within the existing electrical servitude.
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Mapbook Sheet 1 - Alternatives:
Size of the site/servitude:

Alternative A1 (preferred activity alternative)		15m across the Umhlangane River. The pipeline will then be confined to road reserve for this sheet.
Alternative A2		15m across the Umhlangane River. 20m within the existing electrical servitude.

Mapbook Sheet 2 - Alternatives:
Size of the site/servitude:

Alternative A1 (preferred activity alternative)		20m within the existing electrical servitude.
Alternative A2		20m within the existing electrical servitude.

Mapbook Sheet 3 Alternatives:
Size of the site/servitude:

Alternative A1 (preferred activity alternative)		20m within the existing electrical servitude. A new 6m wide servitude is to also be registered for a small section of the route.
Alternative A2		20m within the existing electrical servitude.

Mapbook Sheet 4 Alternatives:
Size of the site/servitude:

Alternative A1 (preferred activity alternative)		20m within the existing electrical servitude.
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Mapbook Sheet 5 Alternatives:
Size of the site/servitude:

Alternative A1 (preferred activity alternative)		20m within the existing electrical servitude.
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Mapbook Sheet 6 Alternatives:
Size of the site/servitude:

Alternative A1 (preferred activity alternative)		20m within the existing electrical servitude. The pipeline work space will be reduced to 15m in the terrestrial grassland area adjacent to the Eastbury Drive Wetland. The route will be followed to avoid traversing through the Eastbury Wetland which the existing electrical servitude goes through.
Alternative A2 (original proposed route – yellow route- alternative report)		20m within the existing electrical servitude.
Alternative A3 (revised proposed route – blue route- alternative report)		20m within the existing electrical servitude. The pipeline will then be confined to road reserve for this sheet.

Mapbook Sheet 7 Alternatives:
Size of the site/servitude:

Alternative A1 (preferred activity alternative)		20m within the existing electrical servitude.
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Mapbook Sheet 8 Alternatives:**Size of the site/servitude:**

Alternative A1 (preferred activity alternative)		20m within the existing electrical servitude.
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7. SITE ACCESS

Does ready access to the site exist?

YES ✓	NO
m	

If NO, what is the distance over which a new access road will be built

Describe the type of access road planned:

N/A

Include the position of the access road on the site plan and required map, as well as an indication of the road in relation to the site.

8. SITE OR ROUTE PLAN

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as Appendix A to this report.

The site or route plans must indicate the following:

- 8.1. the scale of the plan which must be at least a scale of 1:500,
- 8.2. the property boundaries and numbers/ erf/ farm numbers of all adjoining properties of the site,
- 8.3. the current land use as well as the land use zoning of each of the properties adjoining the site or sites,
- 8.4. the exact position of each element of the application as well as any other structures on the site,
- 8.5. the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, street lights, sewage pipelines, storm water infrastructure and telecommunication infrastructure,
- 8.6. walls and fencing including details of the height and construction material,
- 8.7. servitudes indicating the purpose of the servitude,
- 8.8. sensitive environmental elements within 100 metres of the site or sites including (but not limited thereto):
 - rivers, streams, drainage lines or wetlands,
 - the 1:100 year flood line (where available or where it is required by DWA),
 - ridges,
 - cultural and historical features,
 - areas with indigenous vegetation including protected plant species (even if it is degraded or infested with alien species),
- 8.9. for gentle slopes the 1 metre contour intervals must be indicated on the plan and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the plan, and
- 8.10. the positions from where photographs of the site were taken.

9. SITE PHOTOGRAPHS

Colour photographs from the centre of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under Appendix B to this report. It must be supplemented with additional photographs of relevant features on the site, if applicable.

10. FACILITY ILLUSTRATION

A detailed illustration of the facility must be provided at a scale of 1:200 and attached to this report as Appendix C. The illustrations must be to scale and must represent a realistic image of the planned activity/ies.

11. ACTIVITY MOTIVATION

11.1. Socio-economic value of the activity

What is the expected capital value of the activity on completion?	1.4 million	
What is the expected yearly income that will be generated by or as a result of the activity?	N/A	
Will the activity contribute to service infrastructure?	YES ✓	NO
Is the activity a public amenity?	YES	NO ✓
How many new employment opportunities will be created in the development phase of the activity?	The tender document will inform that decision. EThekweni has policies that govern such processes. The project is at Environmental Assessment phase. If a positive RoD is obtained and the project goes ahead, necessary policies will be implemented and such will be communicated to the ward councillors	
What is the expected value of the employment opportunities during the development phase?		
What percentage of this will accrue to previously disadvantaged individuals?		
How many permanent new employment opportunities will be created during the operational phase of the activity?	None, it is expected that the pipeline in this servitude will continue to be managed and maintained as they always have, by the same team.	
What is the expected current value of the employment opportunities during the first 10 years?	N/A	
What percentage of this will accrue to previously disadvantaged individuals?	N/A	

11.2. Need and desirability of the activity

Motivate and explain the need and desirability of the activity (including demand for the activity):

The existing Northern Aqueduct (NAX) operated by EWS is a network of bulk supply pipelines that serves the north eastern portion of their area of supply (in general): north of the Umgeni River, to the south of the Ohlanga River and east of Ntuzuma. The existing NA aqueduct conveys potable water from Durban Heights Waterworks to a large number of terminal reservoirs and pressure reducing valves (PRVs) in the system that in turn supply water to residents and businesses in the respective reservoir and PRV supply zones. In recent years, the Northern Aqueduct has reached capacity on various sections of the trunk mains as a result of exponential growth in development and in demand. The Umhlanga region which receives water at the tail end of the aqueduct suffers from low residual pressures as a result of friction losses in the trunk mains. In addition, planned developments in the north east will add a substantial new demand at the tail end of the Northern Aqueduct, exacerbating its capacity problems.

Indicate any benefits that the activity will have for society in general:

Improved water supply, to a greater number of recipients, and water pressure, and a more reliable, predictable supply of water is expected to be of benefit to society. The supply of water will not have to be manually regulated during times of high and low demand.

Indicate any benefits that the activity will have for the local communities where the activity will be located:

No direct benefits will accrue to the local community, as the proposed pipeline will merely be passing through this area. However, the improved water supply to greater Durban North and the western areas of Durban will benefit all Durban residents as there will be less likelihood of water shortages or any other effects associated with restricted water supply.

12. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

List all legislation, policies and/or guidelines of any sphere of government that are relevant to the application as contemplated in the EIA regulations, if applicable:

Title of legislation, policy or guideline:

Administering authority:

Date:

National Environmental Management Act No. 107 of 1998, as amended in June 2012.	DWEA & DAEARD	27 November 1998, as amended in June 2012.
National Water Act No 36 of 1998	DWEA	26 August 1998
Environmental Conservation Act, No.73	DWEA & DAEARD	1989
SANS 1200 DB – Standardised specifications for Civil Engineering Construction Section DB: Earthworks (pipe trenches)	SABS	1989
SANS 10120-2 DB: Code of practice for use with standard specifications for civil engineering construction and contract documents Part 2 : Project Specifications Section DB: Earth works (pipe trenches)	SABS	1982
SANS 10120-4 DB: Code of practice for use with standard specifications for civil engineering construction and contract	SABS	1982

13. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

13.1. Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?

YES ✓	NO
-------	----

If yes, what estimated quantity will be produced per month?

Minimal m³

How will the construction solid waste be disposed of? (describe)

The solid waste will be disposed of in the municipal waste stream on a weekly basis. Any excavated soils will be transported to the nearest landfill site and should be used as cover. Alternatively, spoil could be disposed of according to a spoil disposal management plan. The disposal of spoil in accordance to the spoil disposal management plan depends on the volume of spoil produced during construction.

Where will the construction solid waste be disposed of? (provide details of landfill site)

N/A – small amounts will be produced, but spoil may be disposed of at Bisasar Road or Buffelsdraai Landfill sites.

Will the activity produce solid waste during its operational phase?

YES	NO ✓
-----	------

If yes, what estimated quantity will be produced per month?

N/A

How will the solid waste be disposed of? (provide details of landfill site)

N/A

Where will the solid waste be disposed if it does not feed into a municipal waste stream (describe)?

N/A

If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, then the applicant should consult with the competent authority to determine the further requirements of the application.

Can any part of the solid waste be classified as hazardous in terms of the relevant legislation?

YES	NO ✓
-----	------

If yes, contact the KZN Department of Agriculture, Environmental Affairs and Rural Development to obtain clarity regarding the process requirements for your application.

Is the activity that is being applied for a solid waste handling or treatment facility?

YES	NO ✓
-----	------

If yes, contact the KZN Department of Agriculture, Environmental Affairs and Rural Development to obtain clarity regarding the process requirements for your application.

13.2. Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?

YES	NO ✓
-----	------

If yes, what estimated quantity will be produced per month?

N/A

Will the activity produce any effluent that will be treated and/or disposed of on site?

YES	NO ✓
-----	------

If yes, contact the KZN Department of Agriculture, Environmental Affairs and Rural Development to obtain clarity regarding the process requirements for your application.

Will the activity produce effluent that will be treated and/or disposed of at another facility?

YES	NO ✓
-----	------

If yes, provide the particulars of the facility: N/A

Facility name:

Contact person:

Postal address:

Postal code:

Telephone:

Cell:

E-mail:

Fax:

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

N/A

13.3. Emissions into the atmosphere

Will the activity release emissions into the atmosphere?

YES ✓	NO
-------	----

If yes, is it controlled by any legislation of any sphere of government?

YES	NO ✓
-----	------

If yes, contact the KZN Department of Agriculture, Environmental Affairs and Rural Development to obtain clarity regarding the process requirements for your application.

If no, describe the emissions in terms of type and concentration:

<i>There may be occasional/temporary increases in dust emissions as a consequence of construction activities during the construction phase. There will be no emissions into the atmosphere during the operational phase of the project.</i>

13.4. Generation of noise

Will the activity generate noise?

YES ✓	NO
YES	NO ✓

If yes, is it controlled by any legislation of any sphere of government?

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the noise in terms of type and level:

Noise will be created during the operation of construction machinery (e.g. tip trucks, excavators) during the construction phase. There will be no generation of noise during the operational phase of the project.

14. WATER USE

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box(es):

<input checked="" type="checkbox"/> municipal	<input type="checkbox"/> water board	<input type="checkbox"/> groundwater	<input type="checkbox"/> river, stream, dam or lake	<input type="checkbox"/> other	<input type="checkbox"/> the activity will not use water
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If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:

N/A litres	
YES ✓	NO

Does the activity require a water use permit from the Department of Water Affairs?

If YES, please submit the necessary application to the Department of Water Affairs and attach proof thereof to this report.

Mr Brad Graves from Groundtruth has been approached to provide a quote to undertake the Water Use Licence application to the Department of Water Affairs (DWA) for the proposed Umhlangane River crossing and associated crossings en-route. The application for a water use licence will be forwarded to the DAEARD once the application has been submitted and accepted by the DWA.

15. ENERGY EFFICIENCY

Describe the design measures, if any, that have been taken to ensure that the activity is energy efficient:

The operation of the proposed pipeline will not use energy as the pipe will be gravity fed.

The installation / construction of the pipeline will utilise energy, but it is unlikely that this can be prevented, as energy efficient construction vehicles are not yet available.

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

The pipeline will be gravity fed, thus no pumping of water is required; the route of the pipeline was determined on this basis.

SECTION C: SITE/ AREA/ PROPERTY DESCRIPTION

Important notes:

- For linear activities (pipelines, etc) as well as activities that cover very large sites, it may be necessary to complete this section for each part of the site that has a significantly different environment. In such cases please complete copies of Section C and indicate the area, which is covered by each copy No. on the Site Plan.

Section C Copy No. (e.g. A):

- Subsections 1 - 6 below must be completed for each alternative.

1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Mapbook Sheet 1:

S1 - A1: Preferred alternative route

Flat	1:50 → 1:20	1:20 → 1:15	1:15 → 1:10	1:10 → 1:7,5	1:7,5 → 1:5	Steeper than 1:5
------	-------------	-------------	-------------	--------------	-------------	------------------

S1 - A2: Original proposed route

Flat	1:50 → 1:20	1:20 → 1:15	1:15 → 1:10	1:10 → 1:7,5	1:7,5 → 1:5	Steeper than 1:5
------	-------------	-------------	-------------	--------------	-------------	------------------

Mapbook Sheet 2:

S1 - A1: Preferred alternative route

Flat	1:50 → 1:20	1:20 → 1:15	1:15 → 1:10	1:10 → 1:7,5	1:7,5 → 1:5	Steeper than 1:5
------	-------------	-------------	-------------	--------------	-------------	------------------

S1 - A2: Original alternative route

Flat	1:50 → 1:20	1:20 → 1:15	1:15 → 1:10	1:10 → 1:7,5	1:7,5 → 1:5	Steeper than 1:5
------	-------------	-------------	-------------	--------------	-------------	------------------

Mapbook Sheet 3:

S1 - A1: Preferred alternative route

Flat	1:50 → 1:20	1:20 → 1:15	1:15 → 1:10	1:10 → 1:7,5	1:7,5 → 1:5	Steeper than 1:5
------	-------------	-------------	-------------	--------------	-------------	------------------

S1 - A2: Original alternative route

Flat	1:50 → 1:20	1:20 → 1:15	1:15 → 1:10	1:10 → 1:7,5	1:7,5 → 1:5	Steeper than 1:5
------	-------------	-------------	-------------	--------------	-------------	------------------

Mapbook Sheet 4:

S1: Preferred route

Flat	1:50 → 1:20	1:20 → 1:15	1:15 → 1:10	1:10 → 1:7,5	1:7,5 → 1:5	Steeper than 1:5
------	-------------	-------------	-------------	--------------	-------------	------------------

Mapbook Sheet 5:

S1: Preferred route

Flat	1:50 → 1:20	1:20 → 1:15	1:15 → 1:10	1:10 → 1:7,5	1:7,5 → 1:5	Steeper than 1:5
------	-------------	-------------	-------------	--------------	-------------	------------------

Mapbook Sheet 6:

S1 - A1: Preferred alternative route

Flat	1:50 → 1:20	1:20 → 1:15	1:15 → 1:10	1:10 → 1:7,5	1:7,5 → 1:5	Steeper than 1:5
------	-------------	-------------	-------------	--------------	-------------	------------------

S1 - A2: Original alternative route

Flat	1:50 → 1:20	1:20 → 1:15	1:15 → 1:10	1:10 → 1:7,5	1:7,5 → 1:5	Steeper than 1:5
------	-------------	-------------	-------------	--------------	-------------	------------------

S1 - A3: Revised proposed route

Flat	1:50 → 1:20	1:20 → 1:15	1:15 → 1:10	1:10 → 1:7,5	1:7,5 → 1:5	Steeper than 1:5
------	-------------	-------------	-------------	--------------	-------------	------------------

Mapbook Sheet 7:

S1: Preferred route

Flat	1:50 → 1:20	1:20 → 1:15	1:15 → 1:10	1:10 → 1:7,5	1:7,5 → 1:5	Steeper than 1:5
------	-------------	-------------	-------------	--------------	-------------	------------------

Mapbook Sheet 8:

S1: Preferred route

Flat	1:50 → 1:20	1:20 → 1:15	1:15 → 1:10	1:10 → 1:7,5	1:7,5 → 1:5	Steeper than 1:5
------	-------------	-------------	-------------	--------------	-------------	------------------

2. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site (**Please cross the appropriate box**).

Mapbook Sheet 1:

S1 - A1: Preferred alternative route

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
-----------	---------	-----------------------------	---------------	------------------------	-------	----------------------------	------	-----------

S1 – A2: *Original alternative route*

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
-----------	---------	--	---------------	------------------------	-------	----------------------------	------	-----------

Mapbook Sheet 2:

S1 – A1: *Preferred alternative route*

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
-----------	---------	-----------------------------	---------------	------------------------	------------------	----------------------------	------	-----------

S1 – A2: *Original alternative route*

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
-----------	---------	-----------------------------	---------------	------------------------	------------------	----------------------------	------	-----------

Mapbook Sheet 3:

S1 – A1: *Preferred alternative route*

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
-----------	---------	--	---------------	------------------------	------------------	----------------------------	------	-----------

S1 – A2: *Original alternative route*

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
-----------	---------	--	---------------	------------------------	------------------	----------------------------	------	-----------

Mapbook Sheet 4:

S1: *Preferred route*

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
-----------	---------	-----------------------------	---------------	------------------------	------------------	----------------------------	------	-----------

Mapbook Sheet 5:

S1: *Preferred route*

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
-----------	---------	-----------------------------	---------------	------------------------	------------------	----------------------------	------	-----------

Mapbook Sheet 6:

S1 – A1: *Preferred alternative route*

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
-----------	---------	-----------------------------	---------------	------------------------	------------------	---------------------------------------	------	-----------

S1 – A2: *Original alternative route*

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
-----------	---------	-----------------------------	---------------	------------------------	------------------	---------------------------------------	------	-----------

S1 – A3: *Revised proposed route*

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
-----------	---------	-----------------------------	---------------	------------------------	------------------	---------------------------------------	------	-----------

Mapbook Sheet 7:

S1: *Preferred route*

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
-----------	---------	-----------------------------	---------------	------------------------	------------------	---------------------------------------	------	-----------

Mapbook Sheet 8:

S1: Preferred route

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
-----------	---------	-----------------------------	---------------	------------------------	------------------	----------------------------	------	-----------

3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Has a specialist been consulted for the completion of this section?

YES ✓

NO

If YES, please complete the following:

Name of the specialist:

Moore Spence Jones compiled a Geotechnical Report, which has been utilised to complete this section.

Qualification(s) of the specialist:

Consulting Geotechnical, Environmental & Civil Engineers

Postal address:

Moore Spence Jones (PTY) Ltd*Consulting Geotechnical, Environmental & Civil Engineers**2nd Floor, Pharos House, 70 Buckingham Terrace, Westville, 3630*

Postal code:

3630

Telephone:

031 2677202

Cell:

E-mail:

Fax:

031 2665322

Are there any rare or endangered flora or fauna species (including red data species) present on any of the alternative sites?

YES

NO ✓

If YES, specify and explain:

Are there any special or sensitive habitats or other natural features present on any of the alternative sites?

YES ✓

NO

*On the floodplain anticipate alluvium/ residual shale to a depth of 6m.**On the west facing slope the shale beds dip north west. The sandstone beds dip north.**On the west facing slope anticipate residual shale or very soft rock shale at 1.2-1.5m.**Sand, silt, clay, gravelly clay and shale were all encountered along the route.**Groundwater can generally be expected to occur at the interface between transported soils and the underlying residual soils and / or bedrock, particularly during and after rainfall periods. Groundwater seepage can also be expected to proliferate in the vicinity of river, and drainage systems, which include the numerous drainage lines, shallow valleys and streams in the study area.**A geotechnical report has been prepared for the route, a copy of which is attached to this report as Appendix D.**With particular reference to the stability of the sidewalls of trenches it is important to ensure that the toe of the stockpile of soil removed is placed a distance from the trench at least equal to the depth of the trench. The safety issues regarding excavation and working in open, unsupported trenches should fall in line with the requirements of the General Safety Regulations promulgated by Government Notice No. R1031 of 30 May 1986 as amended. It is generally required that trenches deeper than 1.5m must be adequately shored where there is a possibility of collapse. With pipeline trenches in particular there is a tendency to open the trench over significant lengths thereby increasing the risk of sidewall collapse. In any event there must be provision for safe access not more than every 20m along the trench length.*

If YES, specify and explain:

Key issues regarding the stability of trench sidewalls are:

- *Unstable sidewalls*
- *Soft wet soil conditions.*
- *Surcharge loading at edges of trenches*
- *Groundwater seepage*
- *Rainwater runoff*

Of these both surcharge loading and control of rainwater runoff can be managed. Surcharge in the form of stockpiling of backfill, or trenching machinery (pipe laying rigs), must be placed well away from the edge of the trench. The other issues such as soft soils and groundwater ingress must fall under daily audits by professionals well experienced in these matters, otherwise shoring must be introduced.

Unstable Trench Sidewalls – Shale Areas

The pipeline is predominantly underlain by a soil mantle up to about 1.5 metres thick in places, overlying weathered shale of the Pietermaritzburg Formation. The soil mantle may range from fill materials which are loose/ unconsolidated to fairly competent without the need to support excavation sides. As a general indication the soil mantle above the shale bedrock should be battered at a safe angle not steeper than 1V:1H should the excavations need to remain open for more than 24 hours. Incidence of rain or groundwater may require that this temporary batter slope should be flattened to promote stability, at the request of the Engineer. Generally the underlying shales are flatly or horizontally bedded and it is not anticipated that these will result in trench failure even where a near vertical excavation wall is formed. However, care must be taken to ensure that where trenches are cut through shale bedrock and there is evidence of steeply dipping shales which result in the daylighting of bedding or other joint planes into the excavation that a potentially unstable trench sidewall does not occur. It will thus be important that during construction Moore Spence Jones / the geotechnical engineers are requested to confirm the safe angle of batter where such conditions manifest themselves.

Unstable Trench Sidewall – Soft / Loose Alluvial Soils

Soft and very loose soil conditions will be encountered where the pipeline crosses the flat, alluvial section of the Piesang River valley at Duffs Road. The alluvial soils can be expected to have very shallow groundwater conditions with associated sidewall collapse at or below the groundwater seepage. In this area it is thus anticipated that it will be necessary to allow for lateral support in form of sheet piles or trench sheetpiles. Dewatering of groundwater should also be allowed for.

Are any further specialist studies recommended by the specialist?

YES

NO ✓

If YES, specify:

If YES, is such a report(s) attached in Appendix D?

YES ✓

NO

Signature of specialist: N/A – see report attached (Appendix D)

Date:

Is the site(s) located on any of the following (cross the appropriate boxes)?

S1:

Shallow water table (less than 1.5m deep)

Dolomite, sinkhole or doline areas

Seasonally wet soils (often close to water bodies)

Unstable rocky slopes or steep slopes with loose soil

Dispersive soils (soils that dissolve in water)

Soils with high clay content (clay fraction more than 40%)

Any other unstable soil or geological feature

An area sensitive to erosion

YES ✓	NO
YES	NO ✓ Generally shale bedrock was encountered with occasional sandstone and dolerite
YES ✓	NO
YES ✓	NO
YES	NO ✓
YES ✓	NO
YES	NO ✓
YES ✓	NO

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. (Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted).

4. GROUND COVER

Has a specialist been consulted for the completion of this section?

YES ✓

NO

If YES, please complete the following:

Name of the specialist:

Dr James Edmund Granger

Qualification(s) of the specialist:

BSc (Hons) PhD

Postal address:

P O Box 383, Westville

Postal code:

3650

Telephone:

033 342 5731

Cell:

083 701 5241

E-mail:

ed@isik.co.za

Fax:

Are there any rare or endangered flora or fauna species (including red data species) present on any of the alternative sites?

YES

NO ✓

	<p>Most of the vegetation which occurs in the 40m-wide corridor which was assessed for this report has been highly to moderately transformed.</p> <p>The most severe transformation has been caused through human settlement that includes subsistence cultivation. Human settlement and its associated subsistence cultivation has not simply replaced areas of natural vegetation but the currently utilized areas of subsistence cultivation, together with others which have been abandoned, support a wide variety of alien problem-plant species which have invaded other areas which have not been developed or cultivated.</p> <p>Periodic mowing and cutting has also contributed to a decline in the conservation quality of areas of natural vegetation that occur in the corridor. In some instances, especially in woody communities which are crossed by the existing servitude and in which the vegetation appears to be controlled less frequently than the areas dominated by grasses, invasion by alien problem-plant species is more pronounced.</p> <p>Approximately 23% of the corridor comprises areas which form part of usually much larger areas which have been designated by KZN Wildlife as Priority 1 areas. However, the fieldwork and mapping which was undertaken for this report indicates that approximately 84% of the Priority 1 areas which occur within the corridor comprise vegetation which has been transformed to some degree.</p>	
<p>If YES, specify and explain:</p>	<p>No rare or endangered vegetation was encountered, but rare fauna may be present by virtue of some of the vegetation types (mostly referring to the wetland off Eastbury Drive) present on site.</p> <p>Please see specialist report (Appendix D) for full details of the biodiversity conditions on site.</p>	
<p>Are there any special or sensitive habitats or other natural features present on any of the alternative sites?</p>	<p>YES✓</p>	<p>NO</p>
<p>If YES, specify and explain:</p>	<p>1. The wetland and stream which occurs just north of Eastbury Drive is of concern because it is considered possible that one or both of these habitats may be found to support Pickergill's Reed Frog which is a Red Data species.</p> <p>2. Of the 47,948m² of KZNW Priority 1 areas which occur within the corridor 40,085m² or 84% of these areas were mapped (for THIS report) as some category of disturbed vegetation.</p> <p>See Biodiversity report for definition of Red, Orange and Green Flags:</p> <p>Red-flag areas: All polygons which were mapped as any type of wetland are recognised as Red-flag polygons by the Biodiversity Specialist because, being wetland habitats, it is considered inevitable that in creating a corridor approximately 30m-wide, which is necessary in order to be able to lay pipes which are 1.2m in diameter, the potential impacts which will be caused to these habitats – even temporarily – will be severe. Furthermore, in the case of some of these wetland areas it is considered possible that they may support at least one Red-data species namely Pickersgill's Reed Frog.</p> <p>Although, areas which were mapped as forest or thicket or shrubland or indigenous grassland may provide habitat for one or more species of conservation concern most of these areas have not been classified as Red-flag polygons because of the extent to which they have been disturbed and are invaded with alien problem-plant species.</p> <p>Orange-flag areas: Three polygons which were mapped as Short Dense Grassland have been designated as Orange-flag polygons. This flag-status was allocated because: (a) these polygons have been disturbed and are invaded to varying degrees by alien problem-plant species but, (b) they <u>may</u> provide habitat for at least one species of conservation concern namely KwaZulu-Natal Dwarf Chameleon. However, sufficient knowledge and expertise has been gained by a number of biodiversity specialists that if this species is found to be present, individuals can either be captured and relocated or captured and returned to the area in which they were found once the corridor has been rehabilitated. A third reason for allocating an Orange-flag status to these polygons is that relatively similar habitat occurs adjacent to them, in which case it is possible that any chameleons which may be present will simply relocate themselves when they perceive disturbance commencing in the vicinity of their habitat within the corridor.</p> <p>Green-flag areas: Polygons which were designated as Green-flag areas support habitat which has been markedly or entirely transformed. These areas comprise most of the corridor.</p>	
<p>Are any further specialist studies recommended by the specialist?</p>	<p>YES✓</p>	<p>NO</p>

If YES, specify:

Notwithstanding the extent and severity of the transformation of the servitude it should not be assumed that all areas of natural vegetation in the corridor which show evidence of disturbance and transformation do not still provide habitat for one or more plant – but more probably – animal species of conservation concern.

The opinion expressed in the above paragraph pertains to the polygons which have been mapped as Short Disturbed Coastal Forest, Short Dense Thicket and Typha capensis-Phragmites australis Wetland.

The areas of natural vegetation which occur in the corridor where it crosses the Ghandi Luthuli Park are considered to have the highest possibility of supporting animal species of high conservation concern.

It is recommended that all areas of wetland which have been mapped for this report as communities which are characterised by reeds (Phragmites australis) and bulrush (Typha capensis) be searched at the optimum time of year by an appropriately qualified specialist to determine whether these areas support Pickersgill's Reed Frog in particular, but also any others of conservation concern, and, if they do, advise how best to minimise the impacts of construction on these frogs can be minimised.

It is also recommended that an appropriately qualified specialist be briefed to review this report and to carry out a rapid field reconnaissance of the vegetation in the corridor to determine the likelihood of KwaZulu-Natal (Black-headed) Dwarf Chameleon being present. If this is considered to be a possibility then the relevant areas should be searched when these animals are most likely to be found so that they can be rescued.

As regards the remaining animal species of conservation concern which may occur in the corridor it is recommended that a simple illustrated identification guide be compiled and that the contractor and site engineer are obliged to familiarise themselves with its contents. The ECO, in particular, must also be required to be familiar with the contents of same guide and should be the first person to be contacted should any other person involved in the construction of Phase 4 of the NAA encounter any of these species.

The ECO must also be familiar with any practical measures which can be taken to minimise the impact of construction on any of these species should representatives be encountered.

Finally, it is recommended that all areas which have been mapped as comprising indigenous woody vegetation – irrespective of the extent to which it may be disturbed – be rehabilitated as soon as possible after the trench has been backfilled using methods which are aimed at re-establishing the same or better category of natural vegetation.

A Frog study was undertaken by Jeanne Tarrant on the 06/02/2013. The study was undertaken at the wetland near Eastbury Drive to determine if concern surrounding the existence of Pickersgill's Reed Frog along the pipeline route was founded. The findings of the herpetology study revealed that as a result of high levels of habitat transformation over the past three decades, ideal habitat for Pickersgill's Reed Frog is no longer present in the area. Pickersgill's Reed Frog was not detected during the survey, however it is important to consider that the breeding season for this species is almost over at this time of year and it may be that none were calling at the time of the assessment. A total of 10 other frog species (Least concern) were detected in the area during the survey. It is recommended that despite Pickersgill's Reed Frog not being detected during the survey, wetland areas as described in the vegetation report are not impacted on by the proposed construction activities given their Endangered status and support of a high diversity of frog species in general.

If YES, is such a report(s) attached in Appendix D?

YES✓

NO

Signature of specialist: N/A – see report attached (Appendix D)

Date:

The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

Natural veld - good condition ^E	Natural veld with scattered aliens ^E	Natural veld with heavy alien infestation ^E	Veld dominated by alien species ^E	Gardens
Sport field	Cultivated land	Paved surface	Building or other structure	Bare soil

If any of the boxes marked with an “^E” is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise.

5. LAND USE CHARACTER OF SURROUNDING AREA

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

Land use character			Description
Natural area	YES ✓	NO	Unlikely to have any influence or be impacted upon.
Low density residential	YES	NO ✓	
Medium density residential	YES ✓	NO	
High density residential	YES ✓	NO	
Informal residential	YES	NO ✓	May be impacted upon by greater number of mosquito's which would breed in the reeds of a wetland. These may however be eaten by amphibian and bird species.
Retail commercial & warehousing	YES	NO ✓	
Light industrial	YES	NO ✓	
Medium industrial	YES	NO ✓	
Heavy industrial	YES	NO ✓	
Power station	YES	NO ✓	
Office/consulting room	YES ✓	NO	
Military or police base/station/compound	YES	NO ✓	
Spoil heap or slimes dam	YES	NO ✓	
Quarry, sand or borrow pit	YES	NO ✓	
Dam or reservoir	YES	NO ✓	
Hospital/medical centre	YES	NO ✓	
School/ creche	YES ✓	NO	
Tertiary education facility	YES	NO ✓	
Church	YES	NO ✓	
Old age home	YES	NO ✓	
Sewage treatment plant	YES	NO ✓	
Train station or shunting yard	YES	NO ✓	
Railway line	YES ✓	NO	
Major road (4 lanes or more)	YES ✓	NO	
Airport	YES	NO ✓	
Harbour	YES	NO ✓	
Sport facilities	YES ✓	NO	
Golf course	YES	NO ✓	
Polo fields	YES	NO ✓	
Filling station	YES	NO ✓	
Landfill or waste treatment site	YES	NO ✓	
Plantation	YES	NO ✓	
Agriculture	YES ✓	NO	Some homesteads surrounding the project site have small gardens which they rely on for subsistence farming.
River, stream or wetland	YES ✓	NO	
Nature conservation area	YES	NO ✓	
Mountain, hill or ridge	YES ✓	NO	Steep vegetated embankments
Museum	YES	NO ✓	
Historical building	YES	NO ✓	
Protected Area	YES	NO ✓	
Graveyard	YES	NO ✓	
Archaeological site	YES	NO ✓	
Other land uses (describe)	YES ✓	NO	DMOSS

6. CULTURAL/ HISTORICAL FEATURES

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including archaeological or palaeontological sites, on or within 20m of the site?

YES	NO ✓
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If YES, contact a specialist recommended by AMAFA to conduct a heritage impact assessment. The heritage impact assessment must be attached as an appendix to this report.

Briefly explain the recommendations of the specialist:

A heritage specialist was employed, and based on his experience and knowledge of the area, as well as his previous study done for the NAA project (full EIA) – he recommended that exemption from undertaking a Heritage Study be applied for to AMAFA – this has been done. AMAFA has yet to respond.

Will any building or structure older than 60 years be affected in any way?

YES	NO ✓
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Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?

YES	NO ✓
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If YES, please submit the necessary application to AMAFA and attach proof thereof to this report.

SECTION D: PUBLIC PARTICIPATION

1. ADVERTISEMENT

The person conducting a public participation process must take into account any guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of the application which is subjected to public participation by—

- (a) fixing a notice board (of a size at least 60cm by 42cm; and must display the required information in lettering and in a format as may be determined by the competent authority) at a place conspicuous to the public at the boundary or on the fence of—
 - (i) the site where the activity to which the application relates is or is to be undertaken, and
 - (ii) any alternative site mentioned in the application,
- (b) giving written notice to—
 - (i) the owner or person in control of that land if the applicant is not the owner or person in control of the land,
 - (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken,
 - (iii) owners 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,
 - (iv) 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,
 - (v) the local and district municipality which has jurisdiction in the area,
 - (vi) any organ of state having jurisdiction in respect of any aspect of the activity (as identified in the application form for the environmental authorization of this project), and
 - (vii) any other party as required by the competent authority,
- (c) placing an advertisement in—
 - (i) one local newspaper, or
 - (ii) any official *Gazette* that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations,
- (d) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official *Gazette* referred to in subregulation 54(c)(ii), and
- (e) using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desiring of but unable to participate in the process due to—
 - (i) illiteracy,
 - (ii) disability, or
 - (iii) any other disadvantage.

2. CONTENT OF ADVERTISEMENTS AND NOTICES

A notice board, advertisement or notices must:

- (a) indicate the details of the application which is subjected to public participation, and
- (b) state—
 - (i) that an application for environmental authorization has been submitted to the KZN Department of Agriculture, Environmental Affairs and Rural Development in terms of the EIA Regulations, 2010, (ii)
 - (iii) a brief project description that includes the nature and location of the activity to which the application relates,
 - (iv) where further information on the application can be obtained, and
 - (iv) the manner in which and the person to whom representations in respect of the application may be made.

3. PLACEMENT OF ADVERTISEMENTS AND NOTICES

Where the proposed activity may have impacts that extend beyond the municipal area where it is located, a notice must be placed in at least one provincial newspaper or national newspaper, indicating that an application will be submitted to the competent authority in terms of these regulations, the nature and location of the activity, where further information on the proposed activity can be obtained and the manner in which representations in respect of the application can be made, unless a notice has been placed in any *Gazette* that is published specifically for the purpose of providing notice to the public of applications made in terms of the EIA regulations.

Advertisements and notices must make provision for all alternatives.

4. DETERMINATION OF APPROPRIATE PROCESS

The EAP must ensure that the public participation process is according to that prescribed in regulation 54 of the EIA Regulations, 2010, but may deviate from the requirements of subregulation 54(2) in the manner agreed by the KZN Department of Agriculture, Environmental Affairs and Rural Development as appropriate for this application. Special attention should be given to the involvement of local community structures such as Ward Committees, ratepayers associations and traditional authorities where appropriate.

Please note that public concerns that emerge at a later stage that should have been addressed may cause the competent authority to withdraw any authorisation it may have issued if it becomes apparent that the public participation process was inadequate.

5. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments and respond to each comment of the public before this application is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA regulations (regulation 57 in the EIA Regulations, 2010) and be attached as Appendix E to this report.

6. PARTICIPATION BY DISTRICT, LOCAL AND TRADITIONAL AUTHORITIES

District, local and traditional authorities (where applicable) are all key interested and affected parties in each application and no decision on any application will be made before the relevant local authority is provided with the opportunity to give input. The planning and the environmental sections of the local authority must be informed of this application and provided with an opportunity to comment.

Has any comment been received from the district municipality?

YES

NO ✓

If "YES", briefly describe the feedback below (also attach any correspondence to and from this authority with regard to this application):

The BIDS and associated mapping have been sent to respective departments for comment however, no correspondence has been received as yet.

The EThekweni Municipality's Environmental Planning and Climate Protection Department was contacted on the 06th of March 2013 via telephonic correspondence. Mr Greg Mullins stated that comments on the BID were still being compiled.

Has any comment been received from the local municipality?

YES

NO ✓

If "YES", briefly describe the feedback below (also attach any correspondence to and from this authority with regard to this application):

The BIDS and associated mapping have been sent to respective departments for consolidated comment. We are still awaiting comment – all correspondence is attached to this report (Annexure E)

Has any comment been received from a traditional authority?

YES

NO ✓

If "YES", briefly describe the feedback below (also attach any correspondence to and from this authority with regard to this application):

Traditional Authority is not affected. All land affected by this proposal is municipality owned or servitude.

7. CONSULTATION WITH OTHER STAKEHOLDERS

Any stakeholder that has a direct interest in the site or property, such as servitude holders and service providers, should be informed of the application and be provided with the opportunity to comment.

Has any comment been received from stakeholders?

YES ✓

NO

If "YES", briefly describe the feedback below (also attach copies of any correspondence to and from the stakeholders to this application):

Please see the Comments and Responses Report (CRR) attached.

A comprehensive Public Participation Process (PPP) was undertaken by a specialist PP company (Duyaza) – the PPP report is attached.

All the Councillors in the affected areas were contacted. Focus groups and meetings were held, and telephone calls and emails were exchanged. Meeting venues and minutes are contained within the Public Participation Report (Appendix E)

Three adverts were placed in the local newspapers:

The Mercury

The Isolweze

The Phoenix Tabloid

Several (>8) site notices were placed along the route at regular intervals.

A Background Information Document Drop was undertaken over a period of 7 days by volunteers from the project area. Ward 48 and ward 49 identified the need for two volunteers whereas ward 102 identified the need for four people as the area that needed to be covered was larger in comparison to the other two wards. These volunteers were kitted out in distinctive clothing and were inducted by the public participation team within their own wards, the process was explained and the volunteers were provided the project maps to use in order to identify the houses situated closer to the servitude. The names of the residents who assisted with these notice drops were provided by the local councillors. The contact details of residents who were handed BIDs were recorded.

SECTION E: IMPACT ASSESSMENT

The assessment of impacts must adhere to the requirements in the EIA Regulations, 2010, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

List the main issues raised by interested and affected parties.

Main issues are listed in the CRR – summarised here:

Will my property be affected by construction and how?
How will people who have built on or who are growing crops and vegetables within the servitude be affected / compensated?
Access to property during construction.
How will construction within the road reserve affect traffic?
Employment of local labour during construction.
Safety and security during construction.
Safety in and around the trench during construction.
Safety of such a big pipe – what if it bursts (during operation)?
Concerns surrounding the protection of domestic livestock and troops of wild monkeys
Communication with the community during construction
Disturbance of existing taxi rank and Engen filling station

Comments from KZNW (received on 30 January 2013):

- Durban Metropolitan Open Space System (D'MOSS) areas. These ensure that critical linkages between populations located elsewhere along river systems are maintained. The impacts onto these areas in relation to the critical species they support should be addressed in the BAR as well as the EMPR.
- The potential of the proposed pipeline to impact upon potential Red data/Endemic species such as Natal Dwarf Chameleon etc. present along the alleged pipeline route.
- Detailed information pertaining to all watercourse crossings (i.e. GPS locations and or imagery if possible). Potential loss of important vegetation communities, wetland areas and impacts on functionality of these areas should also be included when determining mitigatory measures.
- Mitigatory measures (regarding construction method, materials etc) which address bridging the pipeline over these watercourses, should be addressed in an Environmental Management Plan (EMPR).
- The alignment of the current project in relation to the proposed Ethekwini Water Reuse application (DM/0033/10)

Comments from KZNW after the review of the Biodiversity and Frog Study Report (received on 04th of March 2013)

The Frog and Biodiversity Specialist reports have been reviewed by Ezemvelo KZN Wildlife's specialist and planning staff. Based on the information provided, Ezemvelo is of the opinion that alternative routes must be considered given the high biodiversity within this area (which is in accordance with the requirements of NEMA Act 107 of 1998). Wetland areas and the surrounding riparian vegetation should not be damaged by the proposed development. The sections of the proposed alignment described in the Frog study, is historically Pickersgill's Reed Frog habitat and there is potential for the sites to be rehabilitated for the re-introduction of the Pickersgill's Reed Frog. In this regard, Ezemvelo cannot foreclose on conservation opportunities for critically endangered species and hence alternative routes for the pipeline should be proposed and evaluated.

Comments from WESSA are recorded in the CRR

Comments from DWA are recorded in the CRR

Comments from AMAFA are recorded in the CRR

Still awaiting consolidated City Comments

Response from the practitioner to the issues raised by the interested and affected parties (A full response must be given in the Comments and Response Report that must be attached as Appendix E to this report):

Will my property be affected by construction and how?

No private properties will be directly impacted upon by construction. Most of the proposed route is within an existing servitude. This servitude is currently occupied by two parallel pipelines (450 – 500mm in diameter) and an overhead transmission line (Durban Metro Electricity). These pipes and powerlines will be retained, and the proposed 1,2m NAA will be installed 'next to' the existing pipes. The remainder of the proposed route which is not within the existing servitude will be within the road reserve.

Existing home owners and residents may be inconvenienced by the construction activities, as access will be limited. Structures which have been built within the servitude (i.e. illegally) may be at risk however.

In instances where private property, such as walls etc are affected by construction because of their very close proximity to the servitude or construction activities, these will be repaired or replaced to the same standard. The contractor is to ensure that evidence

in the form of before and after construction photographs are taken and filed to be used in the event of a claim or dispute.

How will people who have built on or who are growing crops and vegetables gardens within the servitude be affected / compensated?

Structures which have been illegally built within the servitude and which will be affected by construction will not be replaced. Market gardeners and farmers will be given ample warning of impending construction near their crops. They will thus be able to plan to harvest the crops prior to the construction 'train' reaching an area, and in so doing will avoid any crop losses. The channels of communication must remain open in order for this process to succeed.

Access to property during construction.

In some instances access will be disrupted, residents may have to use alternative routes, may experience delays, or wait at stop-go 'intersections', however access in some form will always be maintained. This situation is likely to be most prevalent in Mount Moriah along Mount Moriah Drive and Simunye Avenue and on Burnhill Cls and Catford Crescent in Phoenix. Residents in (or using) other roads which will be affected but not as significantly include: Eleka Rd, Yeyi St, Kalula St, Mela St, Str 121359, Str 122322, Str 122323, Str 122335, Stonebridge Dr, Bush Rd, Eastwood Rd, Parkmead Ave, Rainbird Cls, Greenbury Dr, Rainham Rd, Rainhill Cls, Cardinal Rd, Portbridge Pl, Longbridge Walk, Catford Cres, Calshot Cres, Clayfield Dr, Eastbury Dr, Longbury Dr, Ridgcroft Dr, Northbury Ave, and Edgebury Rd.

How will construction within the road reserve affect traffic?

See question above.

Road users may experience delays, heavier than usual traffic, and disruptions – but access will always be maintained. Where roads have to be closed off completely an alternative route will be provided. Road users will need to plan their travel taking into account potential delays. Each section of of pipeline trench which is opened up (and hence traffic which may be affected in that area), will only be open for a maximum of two months at a time.

Employment of local labour during construction.

Where local skills are available these will be utilised if possible. This will only be determined at the tender stage however, as contractors tendering for this construction work will provide their own methodology and labour plans. This Environmental Report will however, recommend the use of local labour where practical.

Safety and security during construction.

The construction site will be cordoned off from the public, and the construction workers will also not be permitted to leave the site to access private land. Security (either municipal or private, to be determined at tender stage) will be employed to ensure the integrity of this system.

Safety in and around the trench during construction.

The construction site will be fenced off with bonnox fencing and danger tape during construction. Access to the site by local residents will be strictly prohibited and local residents will be informed of the dangers (to personal safety) of accessing the construction site. Access will only be possible through a gate, any access will be a deliberate act; no accidental access will be possible.

Safety of such a big pipe – what if it bursts (during operation)?

New steel pipes are continuously welded. Cathodic protection over the pipe will prevent corrosion of the pipe. The pipeline can be laid in the ground indefinitely (i.e. 100s of years) provided that the cathodic protection is maintained.

Concerns surrounding the protection of domestic livestock and troops of wild monkeys:

The proposed project area possesses livestock e.g. chickens, dogs and cats roaming the streets as well as a troop of monkeys that frequent the proposed project area. They have been observed at almost every visit to the project area. The community meeting also highlighted the need to protect the animals during construction. The Environmental Management Plan states that no local fauna may be interfered with during construction. No hunting, snares or trapping of animals are allowed either. The Environmental Control officer appointed to uphold the contents of the EMP will have to ensure that the stipulations of the plan are adhered to.

Communication with the community during construction

It was proposed during a community meeting that a Community Liaison Officer (CLO) be appointed during the construction phase of the project. It was proposed that this individual reside within the affected ward. As the project is transgressing in to 3 different wards, it was requested that the project appoint a CLO per ward. Any construction related appointments will be undertaken under the discretion of the client. A Communications Plan (CP) has also been devised as an appendix to the Environmental Management Plan. The CP which will provide the contractor with communication strategy during the construction phase.

Disturbance of existing taxi rank and Engen filling station

The proposed route will pass next to the taxi rank at the bottom of Mount Moriah Drive. Before construction begins the project manager and the ward councillor must introduce the contractor to the taxi rank management. It is very important to inform the taxi managers about the construction activity and duration as they will need to inform the commuters in advance should there be a need for them to look for an alternate space. An Engen Filling Station also exists within this area. The entrance to this filling station will not be affected during construction.

Responses to KZNW comments (Azrah Essop) received on the 30th of January 2013:

- Durban Metropolitan Open Space System (D'MOSS) areas. These ensure that critical linkages between populations located elsewhere along river systems are maintained. The impacts onto these areas in relation to the critical species they support should be addressed in the BAR as well as the EMPR.

This aspect has been fully investigated in a biodiversity report undertaken by Dr Granger. He did not find any significant issues which would impact negatively on D'MOSS. (His report was forwarded and reviewed by KZNW).

- The potential of the proposed pipeline to impact upon potential Red data/Endemic species such as Natal Dwarf Chameleon etc. present along the alleged pipeline route.

Dr Granger found NO red data species along the route, but has a concern that Pickersgill Reed Frog may be present in the wetland north of Eastbury Drive. We have appointed a frog specialist to investigate this aspect. The specialist findings revealed that the area in question is highly transformed and the ideal habitat for Pickersgill Reed Frog is no longer present in the area. It was recommended by the specialist that despite Pickersgill Reed Frog not being detected in the area during the survey, that the wetland on Eastbury Drive not be impacted on by the proposed construction activities given their endangered status and support of a high diversity of frog species in general. The herpetology report was sent to KZNW for review. KZNW have requested that alternative routes must be considered given the high biodiversity within this area (which is in accordance with the requirements of NEMA, Act 107 of 1998). Wetland areas and the surrounding riparian vegetation should not be damaged by the proposed development. Two alternatives around the wetland have been proposed.

Mapbook Sheet 6: Alternative 1 (Engineers 'Preferred' option: Route 1)

The proposed preferred alternative turns and runs in a westerly direction for 200m along Eastbury Drive. It then crosses Eastbury Drive and traverses 475m of terrestrial grassland area before crossing a drainage line and re-entering the existing electrical servitude.

Mapbook Sheet 6: Alternative 3 (Engineers 'Not Preferred' option: Route 2)

The route turns East at Eastbury Drive and runs 520m to the intersection with Croftbury Drive. Here the route turns north and continues within the road surface of Croftbury Drive for 720m until reaching the road reserve of Longbury Drive.

Further information on the alternative route will be contained in the route amendment report [\(Appendix G\)](#)

Dr Granger further found no Dwarf Chameleon, but suggested that a specialist / KZNW review his report and advise whether these species may be present, considering the habitat which he found to be present. The biodiversity report was submitted to Ezemvelo Wildlife and has been reviewed. We requested that KZNW advise us how to proceed regarding the Dwarf Chameleon concern.

- Detailed information pertaining to all watercourse crossings (i.e. GPS locations and or imagery if possible). Potential loss of important vegetation communities, wetland areas and impacts on functionality of these areas should also be included when determining mitigatory measures.

There is only ONE major river crossing – found at the beginning of the proposed pipeline route (the Umhangane River). This river is highly modified, and the proposed construction activities are unlikely to impact the functionality of this system. The steep bank is to be avoided, and the pipeline will be buried. The proposed methodology to be used has been included in the EMP). There are a few tributaries which will also be crossed along the route. The names and geographic coordinates each tributary is as follows:

1. Tributary of Umhangane River, near Road 121488. No property details available.
(X 1 986.882051265; Y -3 291 110.97190685)
(Latitude 29°44'18.10"S; Longitude 31° 1'13.94"E)
2. Tributary of Umhangane River. Erf 711 Rainham, near Stonebridge Drive. Owner: eThekweni Municipality
(X 2 043.930741746; Y -3 290 396.71895057)
(Latitude 29°43'54.91"S; Longitude 31° 1'16.06"E)
3. Tributary of Umhangane River. Erf 989 Southgate, near Stonebridge Drive. Owner: NBS Developments
(X 2 043.930741746; Y -3 290 396.71895057)
(Latitude 29°43'54.91"S; Longitude 31° 1'16.06"E)
4. Greenbury Stream, tributary of Umhangane River. Erf 541 Rainham, near Parkmead Avenue. Owner: eThekweni Municipality
(X 1 951.069437489; Y -3 289 789.27743644)
(Latitude 29°43'35.18"S; Longitude 31° 1'12.60"E)
5. Greenbury Stream, tributary of Umhangane River, near Greenbury Drive. No property details available.
(X 1 901.15569183 m; Y -3 289 466.14116516)
(Latitude 29°43'24.69"S; Longitude 31° 1'10.74"E)
6. Greenbury Stream, tributary of Umhangane River. Erf 28 Stonebridge. Owner: Durban Corporation
(X 1 843.780681247; Y -3 289 100.93605975)
(Latitude 29°43'12.82"S; Longitude 31° 1'8.60"E)
7. Umhangane River and Tributary of Umhangane River. Erf 15352 Lot Douglas, alongside Eastbury Drive. Owner: eThekweni Municipality
(X 1 688.337662023; Y -3 288 079.60266292)
(Latitude 29°42'39.66"S; Longitude 31° 1'2.81"E)
8. Tributary of Umhangane River. Erf 1140 Longcroft, near Ridgcroft Road. Owner: eThekweni Municipality
(X 1 622.297529947; Y -3 287 438.0926299)
(Latitude 29°42'18.82"S; Longitude 31° 1'0.35"E)

A Water Use License for all crossings will be applied for.

The wetland, which is located north of Eastbury Drive (29° 42' 36.79"S, 31° 1' 3.30"E) has been investigated by the frog specialist and her findings have been included in the BAR. It was recommended by the specialist that despite Pickersgill Reed Frog not being detected in the area during the survey, that the wetland on Eastbury Drive not be impacted on by the proposed construction activities given their endangered status and support of a high diversity of frog species in general. An alternative route to avoid the wetland has been sort. Further information on the alternative route will be contained in the Route Amendment Report (Appendix G)

- Mitigatory measures (regarding construction method, materials, etc) which address bridging the pipeline over these watercourses, should be addressed in an Environmental Management Plan (EMPR).

These will be addressed in the EMP, yes. The standard crossing methodology which will be employed to bury the pipeline, has been included in the EMP.

- The alignment of the current project in relation to the proposed eThekweni Water Reuse application (DM/0033/10).

We do not have the alignment of the reuse application. The engineers work in close collaboration with the applicant, (EWS) who would also be the same applicant in the aforementioned application. It is highly unlikely that these two projects would be in conflict in any way.

Responses to KZNW comments (Azrah Essop) received on the 04th of January 2013:

Alternatives to this section of the pipeline will be sort.

Further responses to issues raised by IAPS are recorded in the CRR (**Appendix E**).

2. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES

2.1. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN PHASE

a. Site alternatives

List the **potential impacts** associated with site alternatives that are likely to occur during the **planning and design phase**:

Alternative S1 (preferred alternative)

Direct impacts:

No significant impacts are expected during the planning and design phase.

Indirect impacts:

No significant impacts are expected during the planning and design phase.

Cumulative impacts:

No significant impacts are expected during the planning and design phase.

Alternative S2 (if any)N/A

Direct impacts:

Indirect impacts:

Cumulative impacts:

No-go alternative (compulsory)

Direct impacts:

No significant impacts are expected during the planning and design phase.

Indirect impacts:

No significant impacts are expected during the planning and design phase.

Cumulative impacts:

No significant impacts are expected during the planning and design phase.

Indicate mitigation measures to manage the potential impacts listed above:

Alternative S1

No mitigation necessary.

b. Process, technology, layout or other alternatives

List the **impacts associated** with any process, technology, layout or other alternatives that are likely to occur during the **planning and design phase** (please list impacts associated with each alternative separately):

Alternative A1 (preferred alternative)

Direct impacts:

1. **Issue: Planning of Storage areas** – Poor storage area determination during the planning and design phase of the proposed project could result in stockpiling of pipe and/or spoil in sensitive or dangerous areas. Sensitive areas could include riparian and vegetation (including wetlands) or areas prone to erosion, and dangerous areas, those in which the stockpiles of soil or pipes could become destabilised. **Significance statement:** This is of medium significance but can be mitigated to be of low significance.
2. **Issue: Provision of Infrastructure** – The proposed construction of the pipeline is advantageous in terms of improving the service infrastructure. **Significance Statement:** Medium High Positive Impact (no mitigation required).
3. **Issue: Proposed location of the pipeline and associated fauna and flora** – The proposed pipeline was thought to have been located within an area which is home to rare frog species – near the Eastbury Drive Park (Luthuli Ghandi Park). A specialist study was undertaken by Specialist herpetologist, Dr Jeanne Tarrant. The specialist findings revealed that the area in question is highly transformed and the ideal habitat for Pickersgill Reed Frog is no longer present in the area. It was recommended by the specialist that despite Pickersgill Reed Frog not being detected in the area during the survey, that the wetland on Eastbury Drive not be impacted on by the proposed construction activities given their endangered status and support of a high diversity of frog species in general. **Significance Statement:** This is of high significance but can be mitigated to be of low significance.

Indirect impacts:

No significant impacts are expected during the planning and design phase.

Cumulative impacts:

No significant impacts are expected during the planning and design phase.

Alternative A2 (if any) Layout (or route) alternatives will result in the same impacts as those encountered on the preferred route.

Direct impacts:

Indirect impacts:

Cumulative impacts:

No-go alternative (compulsory)

Direct impacts:

1. **Issue: Provision of Water for Northern Durban** – Should the proposed pipeline not be constructed, the amount and quality of the available water supply for all the areas surrounding the route and well beyond to the north, will be compromised in the immediate and long term future.

Indirect impacts:

No significant impacts are expected during the planning and design phase.

Cumulative impacts:

No significant impacts are expected during the planning and design phase.

Indicate **mitigation measures** to manage the potential impacts listed above:

Alternative A1:

Direct impacts:

1. **Mitigation: Planning of Storage areas** – Location of storage areas must take into account prevailing winds and general on-site topography and vegetation. Storage areas must be demarcated and fenced if necessary. No storage should take place near river banks, within wetland areas, in areas deemed to be of sensitive vegetation, or in erosion prone areas. Fire prevention facilities must be present at all storage facilities.
2. **Mitigation: Provision of Infrastructure** – The proposed construction of the pipeline is advantageous in terms of providing service infrastructure. The provision of service infrastructure in this area will assist in the development of the region and Northern Durban as a whole.
3. **Mitigation: Proposed location of the pipeline and associated fauna and flora** – A route realignment was sort for this section of the pipeline in order to avoid impact on the Eastbury Drive Wetland. KZNW were provided with the biodiversity and frog study reports. The biodiversity specialist has advised that the chameleons (if present) may relocate of their own volition), suitable alternative habitats are: a) very rare, b) already occupied by other, very territorial, chameleons c) obtaining a relocation permit is a costly and lengthy procedure, with the relocation process rarely being successful or measurable. Dr Granger further

found no Dwarf Chameleon, but suggested that a specialist / KZNW review his report and advise whether these species may be present, considering the habitat which he found to be present. The biodiversity report was submitted to Ezemvelo Wildlife and has been reviewed. We requested that KZNW advise us how to proceed.

All areas which have been mapped as comprising indigenous woody vegetation – irrespective of the extent to which it may be disturbed – will be rehabilitated as soon as possible after the trench has been backfilled using methods which are aimed at re-establishing the same or better category of natural vegetation.

Indirect impacts:

N/A

Cumulative impacts:

N/A

2.2. IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

a. Site alternatives

List the **potential impacts** associated with site alternatives that are likely to occur during the **construction phase**:

Alternative S1 (preferred site)

Direct impacts:

Socio-economic

1. **Issue: Removal of Fences/Walls** – Fences will be removed in some areas to make way for the construction process, but only where these either encroach on the servitude, or where they are so close to construction that they would collapse during the construction process. **Significance Statement:** Prior planning (to avoid all structures where possible, even within the servitude) and replacement of removed walls / fences will mitigate this impact from moderate - low significance to low significance. The developer is not obliged to avoid (or even replace) walls and fences (or any other structures) within the servitude however, and this method will not be relied upon.
2. **Issue: Crops** – Occupiers of the servitude may experience a loss of crops within the project boundary, if not planned properly. During discussions with IAPs it was agreed that as construction progress could be predicted well ahead of time, planting and harvesting of crops could also be planned so as to avoid damage or loss. **Significant Statement:** Medium low, with mitigation: low
3. **Issue: Employment** – There will be some increase in employment for the local community during the construction phase, but this may be mostly for unskilled labour and will be short term. The volume of this increase can only be determined once the project has gone out to tender, as it will dependent on the winning bids' proposal. **Significant Statement:** Medium low positive (no mitigation necessary).
4. **Issue: Impact on surrounding residences** – Construction activities on the project site may impact neighbouring residences in terms of noise and dust generation and traffic build up caused by construction vehicles. **Significance statement:** Medium low significance.
5. **Issue: Visual impact during construction** – Most of the pipeline length will be laid within an existing servitude, mostly out of sight 'behind' the houses, or within or adjacent to the road surface. The construction activities may look unsightly for a while. **Significance statement:** This is of moderate significance and can be mitigated to low significance; the impact will last for a short period of time.
6. **Issue: Increase in crime during construction** – An influx of labour, combined with the confusion of construction and the possible lowering of walls and fences in certain instances, may result in an increase in crime in the area. **Significance Statement:** Medium, low with mitigation
7. **Issue: Site Safety** – Possible dangers associated with the creation of open trenches, excavations and other construction related debris in areas where people, children and livestock are not confined to movement. **Significance statement:** Moderate significance and can be mitigated to low significance.

Biodiversity/Loss of Vegetation

8. **Issue: Removal of vegetation and disturbance to associated fauna** – During construction it is often necessary to clear more land than will eventually form the installation footprint for construction activities. Construction will require lay down areas and areas designated for particular construction activities such as stockpiling. This has been mapped according to vegetation type and a rehabilitation plan will be prepared to replace the vegetation to a condition closely resembling the existing situation. Much of the route is within an existing servitude, which has been previously disturbed and is sometimes mown. Remaining portions of the route are within the road reserve, and a very small portion of the route is within less disturbed areas. None of the route is within pristine areas. **Significance Statement:** Cleared areas will be kept to an absolute minimum, but will be large for a pipeline of this magnitude, both in width and length. The use of a specialist to assess the site immediately prior to construction to rescue any protected or significant fauna and flora (and assist during servitude rehabilitation) will assist in mitigating this impact from moderate significance to low significance.
9. **Issue: Agriculture** – This may include loss of agricultural crops (market gardening in the servitude) in the area. For some of the route, the proposed pipeline crosses cultivated land which is worked by local residents who live adjacent to the servitude. During discussions with IAPs it was agreed that as construction progress could be predicted well ahead of time, planting and harvesting of crops could also be planned so as to avoid damage or loss. **Significant Statement:** Moderate, with mitigation: low.
10. **Issue: Road reserves** – In some places the proposed pipeline route will pass alongside or within the road servitude. This will affect traffic and access to property, but should not affect biodiversity. Any vegetation which is disturbed alongside roads will be replaced. **Significant Statement:** Low
11. **Issue: Grasslands and Indigenous Vegetation** – Displacement of some indigenous vegetation (including grassland) will occur. A rehabilitation plan will be devised which will detail the location of any such sensitive areas, and vegetation will be replaced to closely resemble that which was removed, as far as is practical. Much of the route is within an existing servitude, which has been previously disturbed and is sometimes mown. Remaining portions of the route are within the road reserve, and a very small portion of the route is within less disturbed areas. None of the route is within pristine areas. **Significance Statement:** Cleared areas will be kept to an absolute minimum. The use of a specialist to assess the site immediately prior to construction to rescue

any protected or significant flora (and assist during servitude rehabilitation) will assist in mitigating this impact from moderate significance to medium-low significance.

12. **Issue: Introduction of alien plant species into the project site** – During the construction and pipeline installation, topsoil brought in from other sites for the laying of pipe and rehabilitation purposes might be contaminated with alien plant seed. **Significance Statement:** This is of low - moderate significance and can be mitigated to low significance.
13. **Issue: Loss of habitat for fauna** – Construction will result in the removal of vegetation and loss of micro-habitats. These should return once vegetation rehabilitation has been completed. Potential microhabitat features such as rocks and logs should be removed from the servitude prior to construction commencing, and then utilised during the rehabilitation process. **Significance Statement:** Low
14. **Issue: Fauna** – Potential loss of small mammals, birds and other fauna like chameleon and frogs. There is a potential for loss of animals through illegal hunting and construction damage. Illegal hunting will be prevented through proper on site staff training and implementation of an Environmental Management Plan. Construction damage is unlikely to be prevented, but will most likely not amount to a significant or extensive impact. Where rare species are anticipated, these should be identified prior to construction and relocated to a safer area (See attached Biodiversity Study and **Section C.4.** Above). **Significance Statement:** Moderate, with mitigation: Medium-Low
15. **Issue: Fire** – Habitat could be destroyed through accidental fires during construction if the Environmental Management Plan is not correctly implemented; no open fires will be permitted during construction. **Significance Statement:** Low

Land/excavation

16. **Issue: The soil profile** – will be disturbed during excavation of the trench and laying of the pipeline. Topsoil and subsoil will however be stockpiled separately and replaced in the order in which they were extracted, to facilitate rehabilitation efforts. **Significance Statement:** Moderate, with mitigation: Low.
17. **Issue: Erosion of stockpiles and exposed steep slopes** – Stockpile erosion may occur if not adequately contained. Slopes may be partly destabilized through the removal of vegetation, boulders and earth especially in steeper areas. This has a potential for soil erosion which will be mitigated through hard engineering mechanisms, including the use of gabions, geofabrics, and contouring, and soft rehabilitation using soil retaining vegetation. Logs and builders found on site during construction should ideally be set aside for use during rehabilitation. **Significance Statement:** Moderate, with mitigation: Low
18. **Issue: Safety** – There is a potential for animals/people to fall into the open trenches during construction. This could result in bodily harm from the fall, collapsing of trench side walls, or even drowning in a water logged trench. The trenches will be clearly demarcated and cordoned off with secure fencing. Access to the trench will have to be deliberate and intentional, accidental access (stumbling across and open trench) is highly unlikely. **Significance Statement:** Moderate, with mitigation: Low
19. **Issue: Pests** – Standing water in excavated areas may become stagnant and provide a breeding ground for mosquitoes. This should be monitored and prevented. In most cases the length of time during which the trench will remain open is short <2 months, and activity within the trench is intense during this time. It is thus unlikely that any standing water will collect and become problematic. **Significance Statement:** Low

Water

20. **Issue: Rivers/streams Crossings** – The pipeline traverses one major river (the Umhlangane River,) and one stream. These will be disturbed during construction increasing the sediment levels/turbidity of the water. Construction within the river / stream bed will be according to strict environmental guidelines which will be documented within the construction specifications which the winning contractor will have to agree to prior to appointment. However, these impacts are expected to be temporary, and limited to the construction phase of the project. Construction in the river bed will occur within the rock, the pipe will be encased in concrete within the rock. All such crossings will be rehabilitated upon completion of the works. **Significance Statement:** Moderate – High, with mitigation: Moderate to Low
21. **Issue: Storm Water Drains** – The pipeline crosses two storm-water drainage lines (and associated wetlands) and these will be impacted upon during the construction process, but will be rehabilitated with suitable indigenous and bank stabilising vegetation. **Significance Statement:** Moderate – High, with mitigation: Medium Low
22. **Issue: Ground water** – No impacts expected.

Access/Traffic

23. **Issue: Access roads** – The pipeline will cross several access roads and driveways. During construction access along these roads will be temporarily prevented or restricted, this may cause some inconvenience, but access will always be available, even if by alternative route or over a temporary 'driveway bridge'. Disturbance to traffic and the affected roads are listed in the section above (**Section E.1**). Access to footpaths used by locals will also be affected during construction should these footpaths traverse the electrical servitude. **Significance Statement:** Moderate – High, with mitigation: Moderate

Waste

24. **Issue: General waste** – will be produced during the construction process. This will be disposed of at the nearest landfill site. **Significance Statement:** Moderate, with mitigation: Low
25. **Issue: Construction waste** – or spoil material will be generated during excavation. This will be disposed of at the nearest landfill site, or where the spoil is uncontaminated, it may be re-used as cover on the servitude or according to the **Spoil**

Disposal Management Plan, as significant amounts of spoil may be generated by this project, which would be wastefully disposed of if merely dumped at landfill. **Significance Statement:** Moderate, with mitigation: Low

26. **Issue: Sewage/effluent** – will be generated by the construction workers. All sewage will be disposed of via the existing sewer system. **Significance Statement:** Low
27. **Issue: Litter** – There will be an increased risk of litter that could arise during the construction phase at the construction sites. All litter generated on site will be collected on a daily basis and retained for weekly disposal with the general waste. An Environmental Management Plan will document how this process is to be managed. **Significance Statement:** Low

Air Quality

28. **Issue: Dust** – Air Quality will be impaired by dust that may be produced during trench excavation and from the driving along gravel access roads. This will be especially nuisance worthy near health care facilities, businesses and schools, and as such construction and movement along gravel access roads near schools should be timed to coincide with school holidays if possible. Management of dust should take place in other instances; the use of water bowsers to reduce dust must be employed especially on windy days. **Significance Statement:** Moderate, with mitigation: Low
29. **Issue: Exhaust emissions** – from construction vehicles will impact on air quality. **Significance Statement:** Low
30. **Issue: Noise** – The noise associated with construction activities may cause disturbance to people and/or animals. All construction related activities will however be restricted to business hours. **Significance Statement:** Moderate, with mitigation: Low

Indirect impacts:

1. **Issue: Air Quality (Fires)** – Potential fire hazards especially during the winter months. **Significance Statement:** Low
2. **Issue: Pollution of the Umhlangane River** – Water pollution as a result of construction activities may occur if construction vehicles leak oil or other hydrocarbons. **Significance statement:** Careful monitoring and management can mitigate this impact which is of low significance to negligible.
3. **Issue: Pollution of surrounding areas** – Transportation of windblown litter etc. from the proposed construction sites and site camp to neighbouring areas. **Significance statement:** This is of low significance and can be mitigated to negligible significance.

Cumulative impacts:

1. **Issue: Improved provision of water will benefit the Surrounding Community** – The proposed construction of the pipeline is advantageous in that the surrounding communities and others in northern Durban will receive an improved (more reliable, better water pressure) water supply, which should be a sustainable supply for the next few decades, (source dependent). **Significance Statement:** Medium High Positive Impact (no mitigation required).

Alternative S2 (if any) N/A

Direct impacts:

Indirect impacts:

Cumulative impacts:

No-go alternative (compulsory)

Direct impacts:

1. **Issue: Provision of Water for Northern Durban** – Should the proposed pipeline not be constructed, the amount and quality of the available water for the community surrounding the project area, and much further afield (all of Northern Durban) will be reduced (compared to this proposal), i.e. it will remain the same. Existing pipelines which are already at carrying capacity, bottlenecked and almost at the end of their design life, will have to suffice. This will result in constraints in development. **Significance Statement:** Medium High, with mitigation: Low

Indirect impacts:

N/A

Cumulative impacts:

N/A

Indicate **mitigation measures** to manage the potential impacts listed above:

Alternative S1 (preferred site)

All mitigation measures should be described in a project specific Construction Environmental Management Plan (CEMP) which should guide the construction process from inception to completion.

Direct impacts:

Socio-economic

1. **Mitigation: Removal of Fences/Walls** – Prior planning (to avoid all structures where possible, even within the servitude) and replacement of removed walls / fences will mitigate this impact. The developer is not obliged to avoid (or even replace) walls and fences (or any other structures) within the servitude however, and this method will not be relied upon.
2. **Mitigation: Crops** – During discussions with IAPs it was agreed that as construction progress could be predicted well ahead of time, planting and harvesting of crops could also be planned so as to avoid damage or loss.
3. **Mitigation: Employment** – Where possible local labour should be employed on the construction site – this will however only be determined once construction begins, and will be managed through the Community Liaison Officer/s.
4. **Mitigation: Impact on surrounding properties** – Impact on residential properties can be minimized through the notification of residents regarding the construction times etc. Noise, dust and traffic mitigatory measures must be dealt with fully in the EMP for the project. Early notifications for impacts on any of the basic residential services (electricity, water, telephone) must be given in advance.
5. **Mitigation: Visual impact during construction** – The pipeline scar must be limited in width following proper rehabilitation of the trench, naturally occurring indigenous species will be given a chance to re-establish themselves over the scar. The use of a rehabilitation plan and proper planning will result in growth of indigenous grass species – these should be replanted from nursery stock or from sods removed from the pipeline servitude prior to construction beginning. The construction activities may look unsightly for a while; however, the construction phase of the project is temporary. Nevertheless, the construction sites must be kept clean, neat and orderly at all times. Rubble and litter must be collected on a daily basis and unsightly stockpiling of materials may not occur on site. Any stockpiling which does take place must look neat, and may only occur in designated areas (construction site). Any visual disturbances which do occur must be remedied as soon as possible after the fact (maximum 1 week).
6. **Mitigation: Increase in crime during construction** – Access to the site will be closely monitored, only those permitted on site will be allowed on site. Where private walls / fencing have to be removed, temporary measures should be put in place to provide security. A complaints directory must be established, and all security concerns immediately addressed.
7. **Mitigation: Site Safety** – Only individuals' utilising construction gear and clothing (hard hats, boots, vests) are permitted on the project sites. All construction activity, products and by-products are to be stored on site according to Health and Safety regulations. Danger tape and secure fencing must be used to deter trespassers. Fencing must be erected around all open trenches and excavations. Full site and off-site safety considerations are to be determined in the Environmental Management Plan.

Biodiversity/Loss of Vegetation

8. **Mitigation: Removal of vegetation and disturbance to associated fauna** – Much of the route is within an existing servitude, which has been previously disturbed and is sometimes mown. Remaining portions of the route are within the road reserve, and a very small portion of the route is within less disturbed areas. None of the route is within pristine areas. Cleared areas will be kept to an absolute minimum. The use of a specialist to assess the site immediately prior to construction to rescue any protected or significant fauna and flora (and assist during servitude rehabilitation) will assist in mitigating this impact. No trees / shrubs / groundcover outside of the immediate area designated for the construction may be removed or stripped without the approval of the ECO. The ECO must be given an opportunity to mark vegetation that is to be conserved before the Contractor begins clearing the installation area. Faunal species removed from the site must be relocated to a suitable alternative environment (possibly nearby) – they may find their way back to this site in time.
9. **Mitigation: Loss of Agricultural Crops** – It was agreed by IAPs present at the public meeting, that since construction progress can be predicted well ahead of time, planting and harvesting of crops should be planned so as to avoid damage or loss. This is a logical mitigation measure and should prove to be effective.
10. **Mitigation: Vegetation in road reserves** – Any vegetation located within the road reserve and disturbed by construction will be replaced to condition similar to or better than the existing condition.
11. **Mitigation: Grasslands and Indigenous Vegetation** – A rehabilitation plan will be devised which will detail the location of any such sensitive areas; vegetation will be replaced to closely resemble that which was removed, as far as is practical. Much of the route is within an existing servitude, which has been previously disturbed and is sometimes mown. Remaining portions of the route are within the road reserve, and a very small portion of the route is within less disturbed areas. None of the route is within pristine areas. Cleared areas will be kept to an absolute minimum. The use of a specialist to assess the site immediately prior to construction to rescue any protected or significant flora (and assist during servitude rehabilitation) will assist in mitigating this impact.
12. **Mitigation: Introduction of alien plant species into the project site** – Care must be taken to avoid the introduction of alien plant species to the site and surrounding areas. Particular attention must be paid to imported soil material especially topsoil which could possibly be used for rehabilitation, pipeline burial purposes and for fill, or used in rehabilitation of any wetlands. To mitigate the establishment of alien plant species, ensure the stability of the affected slopes and reduce soil erosion, a basic rehabilitation programme must be developed and enforced during and post-construction. The rehabilitation programme should take into consideration: local flora when selecting rehabilitation plant species; alien plant species control; and should incorporate as much cut (or removed) vegetation from the construction servitude as possible to stabilize the soil.
13. **Mitigation: Loss of habitat for fauna** – Potential microhabitat features such as rocks and logs must be removed from the servitude prior to construction commencing, and then utilised during the rehabilitation process.
14. **Mitigation: Loss of Fauna** – Illegal hunting will be prevented through proper on site staff training and implementation of an Environmental Management Plan. Where rare species are anticipated, these should be identified prior to construction and

relocated to a safer area (See attached Biodiversity Study and **Section C.4.** Above).

15. **Mitigation: Fire** – An Environmental Management Plan must be correctly implemented; no open fires will be permitted during construction.

Land/excavation

16. **Mitigation: The soil profile** – Topsoil and subsoil will be stockpiled separately and replaced in the order in which they were extracted.
17. **Mitigation: Erosion of stockpiles and exposed steep slopes** – Soil erosion should be mitigated through hard engineering mechanisms, including the use of gabions, geofabrics, and contouring, and soft rehabilitation using soil retaining vegetation. Logs and builders found on site during construction should be set aside for use during rehabilitation.
18. **Mitigation: Safety** – The trenches will be clearly demarcated and cordoned off with secure fencing.
19. **Mitigation: Pests** – Standing water must be drained or filled in.

Water

20. **Mitigation: Rivers/streams Crossings** – Construction within the river / stream bed will be according to strict environmental guidelines which will be documented within the construction specifications which the winning contractor will have to agree to prior to appointment. Construction in the river bed will occur within the rock, the pipe will be encased in concrete within the rock. All such crossings will be rehabilitated upon completion of the works.
21. **Mitigation: Storm Water Drains** – The drainage lines (and associated wetlands) will be rehabilitated with suitable indigenous and bank stabilising vegetation once construction has been completed in section of pipeline installation, and will not be left until the end of the contract to complete.
22. **Mitigation: Ground water** – No impacts expected.

Access/Traffic

23. **Mitigation: Access roads** – Access will always be available, either by 'stop-n-go' an alternative route or over a temporary 'driveway bridge'. Delays are to be expected during construction, but every effort must be made to seek innovative and time saving solutions to avoid motorist frustration and inconvenience to residents. Efforts to reconstruct affected footpaths once construction is complete will be undertaken. Every attempt will be made to maintain access for locals with safety being the underlying factor. There will be access provided to pedestrians within reason.

Waste

24. **Mitigation: General waste** – This will be disposed of at the nearest landfill site.
25. **Mitigation: Construction waste** – This will be disposed of at the nearest landfill site, or where the spoil is uncontaminated, it may be re-used as cover on the servitude or elsewhere, according to the **Spoil Disposal Management Plan**.
26. **Mitigation: Sewage/effluent** – All sewage will be disposed of via the existing sewer system.
27. **Mitigation: Litter** – All litter generated on site will be collected on a daily basis and retained for weekly disposal with the general waste. An Environmental Management Plan will document how this process is to be managed.

Air Quality

28. **Mitigation: Dust** – Construction and movement along gravel access roads near schools should be timed to coincide with school holidays if possible. Should dust pollution become a problem during the construction phase, dust amelioration measures (periodic wetting of exposed surfaces) will have to be put in place. Stripped and cleared areas must be covered / re-vegetated as soon as possible. Hessian cloth or shade cloth should be used on either side of the construction servitude to minimize the movement of dust from the construction site to neighbouring houses. This will serve as an added health and safety feature – in keeping pedestrian traffic off the construction site.
29. **Mitigation: Exhaust emissions** – Standard use of silencers and emissions control on all construction vehicles must be checked and enforced.
30. **Mitigation: Noise generation** – All construction vehicles must be fitted with a standard muffler to reduce vehicle noise. With moderate effort and a clearly defined EMP, noise generated via construction can be mitigated. Construction times should be adjusted to suitable working hours (8am-5pm). All the usual noise mitigating measures as would be required on a construction site will be included in the CEMP. The following are the Environmental, Health and Safety Guidelines should be taken into consideration during the construction phase of the project:
- Selecting equipment with lower sound power levels,
 - Installing suitable mufflers on engine exhausts and compressor components,
 - Re-locate noise sources to areas which are less noise sensitive, to take advantage of distance and natural shielding,
 - Taking advantage during the design stage of natural topography as a noise buffer,
 - Develop a mechanism to record and respond to complaints.

Indirect impacts:

1. **Mitigation: Air Quality (Fires)** – No open fires will be permitted. Telephone numbers of the fire department must be on hand in case of accidental fires. Staff should be trained to deal with small fires in the hope that these can be prevented from spreading.
2. **Mitigation: Pollution of the Umhlangane River** – Careful monitoring and management of construction vehicles can mitigate this impact. General waste must be removed from the project sites on a daily basis and taken to a designated dumping area for weekly collection (municipal stream) – to be placed in a skip until collection. Construction related waste (rubble etc) must be removed from site on a weekly basis and taken to an approved landfill site designated for this purpose. All spills must be contained and reported to the relevant authorities. Contaminated sand/items associated with a spill must be properly disposed of at a landfill site registered for this purpose. Construction vehicles and machinery are not to be serviced on site. Chemical ablution facilities must be made available to construction workers at a rate of 1 toilet per 10 workers and must be serviced regularly. Ablution facilities may not be situated on unstable ground; within the 1:100 year floodline, or situated too far away from the working front, thereby encouraging workers to relieve themselves in the surrounding environment. Ablution facilities must be regularly flushed and maintained in a good condition, and provide the users with sufficient toilet paper. Mandatory site pollution mitigation measures will be included in the EMP.
3. **Mitigation: Pollution of surrounding areas** – As above and: All litter must be removed from site on a daily basis and stored in sealed skips.

Cumulative impacts:

1. **Mitigation: Improved provision of water will benefit the Surrounding Community** – The proposed construction of the pipeline is advantageous in that the surrounding communities and others in northern Durban will receive an improved (more reliable, better water pressure) water supply, which should be a sustainable supply for the next few decades, (source dependent).

b. Process, technology, layout or other alternatives

List the **impacts associated** with process, technology, layout or other alternatives that are likely to occur during the **construction phase** (please list impacts associated with each alternative separately):

Alternative A1 (preferred alternative)

Direct impacts:

Socio-economic

1. **Issue: Removal of Fences/Walls** – Fences will be removed in some areas to make way for the construction process, but only where these either encroach on the servitude, or where they are so close to construction that they would collapse during the construction process. **Significance Statement:** Prior planning (to avoid all structures where possible, even within the servitude) and replacement of removed walls / fences will mitigate this impact from moderate - low significance to low significance. The developer is not obliged to avoid (or even replace) walls and fences (or any other structures) within the servitude however, and this method will not be relied upon.
2. **Issue: Crops** – Occupiers of the servitude may experience a loss of crops within the project boundary, if not planned properly. During discussions with IAPs it was agreed that as construction progress could be predicted well ahead of time, planting and harvesting of crops could also be planned so as to avoid damage or loss. **Significant Statement:** Medium low, with mitigation: low
3. **Issue: Employment** – There will be some increase in employment for the local community during the construction phase, but this may be mostly for unskilled labour and will be short term. The volume of this increase can only be determined once the project has gone out to tender, as it will depend on the winning bids' proposal. **Significant Statement:** Medium low positive (no mitigation necessary).
4. **Issue: Impact on surrounding residences** – Construction activities on the project site may impact neighbouring residences in terms of noise and dust generation and traffic build up caused by construction vehicles. **Significance statement:** Medium low significance.
5. **Issue: Visual impact during construction** – Most of the pipeline length will be laid within an existing servitude, mostly out of sight 'behind' the houses, or within or adjacent to the road surface. The construction activities may look unsightly for a while. **Significance statement:** This is of moderate significance and can be mitigated to low significance; the impact will last for a short period of time.
6. **Issue: Increase in crime during construction** – An influx of labour, combined with the confusion of construction and the possible lowering of walls and fences in certain instances, may result in an increase in crime in the area. **Significance Statement:** Medium, low with mitigation
7. **Issue: Site Safety** – Possible dangers associated with the creation of open trenches, excavations and other construction related debris in areas where people, children and livestock are not confined to movement. **Significance statement:** Moderate significance and can be mitigated to low significance.

Biodiversity/Loss of Vegetation

8. **Issue: Removal of vegetation and disturbance to associated fauna** – During construction it is often necessary to clear more land than will eventually form the installation footprint for construction activities. Construction will require lay down areas and areas designated for particular construction activities such as stockpiling. This has been mapped according to vegetation type and a rehabilitation plan will be prepared to replace the vegetation to a condition closely resembling the existing situation. Much of the route is within an existing servitude, which has been previously disturbed and is sometimes mown. Remaining portions of the route are within the road reserve, and a very small portion of the route is within less disturbed areas. None of the route is within pristine areas. **Significance Statement:** Cleared areas will be kept to an absolute minimum, but will be large for a pipeline of this magnitude, both in width and length. The use of a specialist to assess the site immediately prior to construction to rescue any protected or significant fauna and flora (and assist during servitude rehabilitation) will assist in mitigating this impact from moderate significance to low significance.
9. **Issue: Agriculture** – This may include loss of agricultural crops (market gardening in the servitude) in the area. For some of the route, the proposed pipeline crosses cultivated land which is worked by local residents who live adjacent to the servitude. During discussions with IAPs it was agreed that as construction progress could be predicted well ahead of time, planting and harvesting of crops could also be planned so as to avoid damage or loss. **Significant Statement:** Moderate, with mitigation: low.
10. **Issue: Road reserves** – In some places the proposed pipeline route will pass alongside or within the road servitude. This will affect traffic and access to property, but should not affect biodiversity. Any vegetation which is disturbed alongside roads will be replaced. **Significant Statement:** Low
11. **Issue: Grasslands and Indigenous Vegetation** – Displacement of some indigenous vegetation (including grassland) will occur. A rehabilitation plan will be devised which will detail the location of any such sensitive areas, and vegetation will be replaced to closely resemble that which was removed, as far as is practical. Much of the route is within an existing servitude, which has been previously disturbed and is sometimes mown. Remaining portions of the route are within the road reserve, and a very small portion of the route is within less disturbed areas. None of the route is within pristine areas. **Significance Statement:** Cleared areas will be kept to an absolute minimum. The use of a specialist to assess the site immediately prior to construction to rescue any protected or significant flora (and assist during servitude rehabilitation) will assist in mitigating this impact from moderate significance to medium-low significance.

12. **Issue: Introduction of alien plant species into the project site** – During the construction and pipeline installation, topsoil brought in from other sites for the laying of pipe and rehabilitation purposes might be contaminated with alien plant seed. **Significance Statement:** This is of low - moderate significance and can be mitigated to low significance.
13. **Issue: Loss of habitat for fauna** – Construction will result in the removal of vegetation and loss of micro-habitats. These should return once vegetation rehabilitation has been completed. Potential microhabitat features such as rocks and logs should be removed from the servitude prior to construction commencing, and then utilised during the rehabilitation process. **Significance Statement:** Low
14. **Issue: Fauna** – Potential loss of small mammals, birds and other fauna like chameleon and frogs. There is a potential for loss of animals through illegal hunting and construction damage. Illegal hunting will be prevented through proper on site staff training and implementation of an Environmental Management Plan. Construction damage is unlikely to be prevented, but will most likely not amount to a significant or extensive impact. Where rare species are anticipated, these should be identified prior to construction and relocated to a safer area (See attached Biodiversity Study and **Section C.4.** Above). **Significance Statement:** Moderate, with mitigation: Medium-Low
15. **Issue: Fire** – Habitat could be destroyed through accidental fires during construction if the Environmental Management Plan is not correctly implemented; no open fires will be permitted during construction. **Significance Statement:** Low

Land/excavation

16. **Issue: The soil profile** – will be disturbed during excavation of the trench and laying of the pipeline. Topsoil and subsoil will however be stockpiled separately and replaced in the order in which they were extracted, to facilitate rehabilitation efforts. **Significance Statement:** Moderate, with mitigation: Low.
17. **Issue: Erosion of stockpiles and exposed steep slopes** – Stockpile erosion may occur if not adequately contained. Slopes may be partly destabilized through the removal of vegetation, boulders and earth especially in steeper areas. This has a potential for soil erosion which will be mitigated through hard engineering mechanisms, including the use of gabions, geofabrics, and contouring, and soft rehabilitation using soil retaining vegetation. Logs and builders found on site during construction should ideally be set aside for use during rehabilitation. **Significance Statement:** Moderate, with mitigation: Low
18. **Issue: Safety** – There is a potential for animals/people to fall into the open trenches during construction. This could result in bodily harm from the fall, collapsing of trench side walls, or even drowning in a water logged trench. The trenches will be clearly demarcated and cordoned off with secure fencing. Access to the trench will have to be deliberate and intentional, accidental access (stumbling across and open trench) is highly unlikely. **Significance Statement:** Moderate, with mitigation: Low
19. **Issue: Pests** – Standing water in excavated areas may become stagnant and provide a breeding ground for mosquitoes. This should be monitored and prevented. In most cases the length of time during which the trench will remain open is short <2 months, and activity within the trench is intense during this time. It is thus unlikely that any standing water will collect and become problematic. **Significance Statement:** Low

Water

20. **Issue: Rivers/streams Crossings** – The pipeline traverses one major river (the Umhlangane River,) and one stream. These will be disturbed during construction increasing the sediment levels/turbidity of the water. Construction within the river / stream bed will be according to strict environmental guidelines which will be documented within the construction specifications which the winning contractor will have to agree to prior to appointment. However, these impacts are expected to be temporary, and limited to the construction phase of the project. Construction in the river bed will occur within the rock, the pipe will be encased in concrete within the rock. All such crossings will be rehabilitated upon completion of the works. **Significance Statement:** Moderate – High, with mitigation: Moderate to Low
21. **Issue: Storm Water Drains** – The pipeline crosses two storm-water drainage lines (and associated wetlands) and these will be impacted upon during the construction process, but will be rehabilitated with suitable indigenous and bank stabilising vegetation. **Significance Statement:** Moderate – High, with mitigation: Medium Low
22. **Issue: Ground water** – No impacts expected.

Access/Traffic

23. **Issue: Access roads** – The pipeline will cross several access roads and driveways. During construction access along these roads will be temporarily prevented or restricted, this may cause some inconvenience, but access will always be available, even if by alternative route or over a temporary 'driveway bridge'. Disturbance to traffic and the affected roads are listed in the section above (**Section E.1**). Access to footpaths used by locals will also be affected during construction should these footpaths traverse the electrical servitude. **Significance Statement:** Moderate – High, with mitigation: Moderate

Waste

24. **Issue: General waste** – will be produced during the construction process. This will be disposed of at the nearest landfill site. **Significance Statement:** Moderate, with mitigation: Low
25. **Issue: Construction waste** – or spoil material will be generated during excavation. This will be disposed of at the nearest landfill site, or where the spoil is uncontaminated, it may be re-used as cover on the servitude or according to the **Spoil Disposal Management Plan**, as significant amounts of spoil may be generated by this project, which would be wastefully disposed of if merely dumped at landfill. **Significance Statement:** Moderate, with mitigation: Low

26. **Issue: Sewage/effluent** – will be generated by the construction workers. All sewage will be disposed of via the existing sewer system. **Significance Statement:** Low

27. **Issue: Litter** – There will be an increased risk of litter that could arise during the construction phase at the construction sites. All litter generated on site will be collected on a daily basis and retained for weekly disposal with the general waste. An Environmental Management Plan will document how this process is to be managed. **Significance Statement:** Low

Air Quality

28. **Issue: Dust** – Air Quality will be impaired by dust that may be produced during trench excavation and from the driving along gravel access roads. This will be especially nuisance worthy near health care facilities, businesses and schools, and as such construction and movement along gravel access roads near schools should be timed to coincide with school holidays if possible. Management of dust should take place in other instances; the use of water bowsers to reduce dust must be employed especially on windy days. **Significance Statement:** Moderate, with mitigation: Low

29. **Issue: Exhaust emissions** – from construction vehicles will impact on air quality. **Significance Statement:** Low

30. **Issue: Noise** – The noise associated with construction activities may cause disturbance to people and/or animals. All construction related activities will however be restricted to business hours. **Significance Statement:** Moderate, with mitigation: Low

Indirect impacts:

1. **Issue: Air Quality (Fires)** – Potential fire hazards especially during the winter months. **Significance Statement:** Low

2. **Issue: Pollution of the Umhlangane River** – Water pollution as a result of construction activities may occur if construction vehicles leak oil or other hydrocarbons. **Significance statement:** Careful monitoring and management can mitigate this impact which is of low significance to negligible.

3. **Issue: Pollution of surrounding areas** – Transportation of windblown litter etc. from the proposed construction sites and site camp to neighbouring areas. **Significance statement:** This is of low significance and can be mitigated to negligible significance.

Cumulative impacts:

1. **Issue: Improved provision of water will benefit the Surrounding Community** – The proposed construction of the pipeline is advantageous in that the surrounding communities and others in northern Durban will receive an improved (more reliable, better water pressure) water supply, which should be a sustainable supply for the next few decades, (source dependent). **Significance Statement:** Medium High Positive Impact (no mitigation required).

Alternative A2 Layout (or route) alternatives will result in the same impacts as those encountered on the preferred route.

Direct impacts:

No Technology Alternatives Proposed.

Layout (or route) alternatives will result in the same impacts as those encountered on the preferred route.

Indirect impacts:

Cumulative impacts:

No-go alternative (compulsory)

Direct impacts:

1. **Issue: Provision of Water for Northern Durban** – Should the proposed pipeline not be constructed, the amount and quality of the available water for the community surrounding the project area, and much further afield (all of Northern Durban) will be reduced. Existing pipelines which are already at carrying capacity, bottlenecked and almost at the end of their design life, will have to suffice. This will result in constraints in development. **Significance Statement:** Medium High, with mitigation: Low

Indirect impacts:

N/A

Cumulative impacts:

N/A

Indicate **mitigation measures** to manage the potential impacts listed above:

Alternative A1:

All mitigation measures should be described in a project specific Construction Environmental Management Plan (CEMP) which should guide the construction process from inception to completion.

Direct impacts:

Socio-economic

1. **Mitigation: Removal of Fences/Walls** – Prior planning (to avoid all structures where possible, even within the servitude) and replacement of removed walls / fences will mitigate this impact. The developer is not obliged to avoid (or even replace) walls and fences (or any other structures) within the servitude however, and this method will not be relied upon.
2. **Mitigation: Crops** – During discussions with IAPs it was agreed that as construction progress could be predicted well ahead of time, planting and harvesting of crops could also be planned so as to avoid damage or loss.
3. **Mitigation: Employment** – Where possible local labour should be employed on the construction site – this will however only be determined once construction begins, and will be managed through the Community Liaison Officer/s.
4. **Mitigation: Impact on surrounding properties** – Impact on residential properties can be minimized through the notification of residents regarding the construction times etc. Noise, dust and traffic mitigatory measures must be dealt with fully in the EMP for the project. Early notifications for impacts on any of the basic residential services (electricity, water, telephone) must be given in advance.
5. **Mitigation: Visual impact during construction** – The pipeline scar must be limited in width following proper rehabilitation of the trench, naturally occurring indigenous species will be given a chance to re-establish themselves over the scar. The use of a rehabilitation plan and proper planning will result in growth of indigenous grass species – these should be replanted from nursery stock or from sods removed from the pipeline servitude prior to construction beginning. The construction activities may look unsightly for a while; however, the construction phase of the project is temporary. Nevertheless, the construction sites must be kept clean, neat and orderly at all times. Rubble and litter must be collected on a daily basis and unsightly stockpiling of materials may not occur on site. Any stockpiling which does take place must look neat, and may only occur in designated areas (construction site). Any visual disturbances which do occur must be remedied as soon as possible after the fact (maximum 1 week).
6. **Mitigation: Increase in crime during construction** – Access to the site will be closely monitored, only those permitted on site will be allowed on site. Where private walls / fencing have to be removed, temporary measures should be put in place to provide security. A complaints directory must be established, and all security concerns immediately addressed.
7. **Mitigation: Site Safety** – Only individuals' utilising construction gear and clothing (hard hats, boots, vests) are permitted on the project sites. All construction activity, products and by-products are to be stored on site according to Health and Safety regulations. Danger tape and secure fencing must be used to deter trespassers. Fencing must be erected around all open trenches and excavations. Full site and off-site safety considerations are to be determined in the Environmental Management Plan.

Biodiversity/Loss of Vegetation

8. **Mitigation: Removal of vegetation and disturbance to associated fauna** – Much of the route is within an existing servitude, which has been previously disturbed and is sometimes mown. Remaining portions of the route are within the road reserve, and a very small portion of the route is within less disturbed areas. None of the route is within pristine areas. Cleared areas will be kept to an absolute minimum. The use of a specialist to assess the site immediately prior to construction to rescue any protected or significant fauna and flora (and assist during servitude rehabilitation) will assist in mitigating this impact. No trees / shrubs / groundcover outside of the immediate area designated for the construction may be removed or stripped without the approval of the ECO. The ECO must be given an opportunity to mark vegetation that is to be conserved before the Contractor begins clearing the installation area. Faunal species removed from the site must be relocated to a suitable alternative environment (possibly nearby) – they may find their way back to this site in time.
9. **Mitigation: Loss of Agricultural Crops** – It was agreed by IAPs present at the public meeting, that since construction progress can be predicted well ahead of time, planting and harvesting of crops should be planned so as to avoid damage or loss. This is a logical mitigation measure and should prove to be effective.
10. **Mitigation: Vegetation in road reserves** – Any vegetation located within the road reserve and disturbed by construction will be replaced to condition similar to or better than the existing condition.
11. **Mitigation: Grasslands and Indigenous Vegetation** – A rehabilitation plan will be devised which will detail the location of any such sensitive areas; vegetation will be replaced to closely resemble that which was removed, as far as is practical. Much of the route is within an existing servitude, which has been previously disturbed and is sometimes mown. Remaining portions of the route are within the road reserve, and a very small portion of the route is within less disturbed areas. None of the route is within pristine areas. Cleared areas will be kept to an absolute minimum. The use of a specialist to assess the site immediately prior to construction to rescue any protected or significant flora (and assist during servitude rehabilitation) will assist in mitigating this impact.
12. **Mitigation: Introduction of alien plant species into the project site** – Care must be taken to avoid the introduction of alien plant species to the site and surrounding areas. Particular attention must be paid to imported soil material especially topsoil which could possibly be used for rehabilitation, pipeline burial purposes and for fill, or used in rehabilitation of any wetlands. To mitigate the establishment of alien plant species, ensure the stability of the affected slopes and reduce soil erosion, a basic rehabilitation programme must be developed and enforced during and post-construction. The rehabilitation programme should take into consideration: local flora when selecting rehabilitation plant species; alien plant species control; and should incorporate as much cut (or removed) vegetation from the construction servitude as possible to stabilize the soil.
13. **Mitigation: Loss of habitat for fauna** – Potential microhabitat features such as rocks and logs must be removed from the servitude prior to construction commencing, and then utilised during the rehabilitation process.

14. **Mitigation: Loss of Fauna** – Illegal hunting will be prevented through proper on site staff training and implementation of an Environmental Management Plan. Where rare species are anticipated, these should be identified prior to construction and relocated to a safer area (See attached Biodiversity Study and **Section C.4.** Above).
15. **Mitigation: Fire** – An Environmental Management Plan must be correctly implemented; no open fires will be permitted during construction.

Land/excavation

16. **Mitigation: The soil profile** – Topsoil and subsoil will be stockpiled separately and replaced in the order in which they were extracted.
17. **Mitigation: Erosion of stockpiles and exposed steep slopes** – Soil erosion should be mitigated through hard engineering mechanisms, including the use of gabions, geofabrics, and contouring, and soft rehabilitation using soil retaining vegetation. Logs and builders found on site during construction should be set aside for use during rehabilitation.
18. **Mitigation: Safety** – The trenches will be clearly demarcated and cordoned off with secure fencing.
19. **Mitigation: Pests** – Standing water must be drained or filled in.

Water

20. **Mitigation: Rivers/streams Crossings** – Construction within the river / stream bed will be according to strict environmental guidelines which will be documented within the construction specifications which the winning contractor will have to agree to prior to appointment. Construction in the river bed will occur within the rock, the pipe will be encased in concrete within the rock. All such crossings will be rehabilitated upon completion of the works.
21. **Mitigation: Storm Water Drains** – The drainage lines (and associated wetlands) will be rehabilitated with suitable indigenous and bank stabilising vegetation once construction has been completed in section of pipeline installation, and will not be left until the end of the contract to complete.
22. **Mitigation: Ground water** – No impacts expected.

Access/Traffic

23. **Mitigation: Access roads** – Access will always be available, either by 'stop-n-go' an alternative route or over a temporary 'driveway bridge'. Delays are to be expected during construction, but every effort must be made to seek innovative and time saving solutions to avoid motorist frustration and inconvenience to residents. Efforts to reconstruct affected footpaths once construction is complete will be undertaken. Every attempt will be made to maintain access for locals with safety being the underlying factor. There will be access provided to pedestrians within reason.

Waste

24. **Mitigation: General waste** – This will be disposed of at the nearest landfill site.
25. **Mitigation: Construction waste** – This will be disposed of at the nearest landfill site, or where the spoil is uncontaminated, it may be re-used as cover on the servitude or elsewhere, according to the **Spoil Disposal Management Plan**.
26. **Mitigation: Sewage/effluent** – All sewage will be disposed of via the existing sewer system.
27. **Mitigation: Litter** – All litter generated on site will be collected on a daily basis and retained for weekly disposal with the general waste. An Environmental Management Plan will document how this process is to be managed.

Air Quality

28. **Mitigation: Dust** – Construction and movement along gravel access roads near schools should be timed to coincide with school holidays if possible. Should dust pollution become a problem during the construction phase, dust amelioration measures (periodic wetting of exposed surfaces) will have to be put in place. Stripped and cleared areas must be covered / re-vegetated as soon as possible. Hessian cloth or shade cloth should be used on either side of the construction servitude to minimize the movement of dust from the construction site to neighbouring houses. This will serve as an added health and safety feature – in keeping pedestrian traffic off the construction site.
29. **Mitigation: Exhaust emissions** – Standard use of silencers and emissions control on all construction vehicles must be checked and enforced.
30. **Mitigation: Noise generation** – All construction vehicles must be fitted with a standard muffler to reduce vehicle noise. With moderate effort and a clearly defined EMP, noise generated via construction can be mitigated. Construction times should be adjusted to suitable working hours (8am-5pm). All the usual noise mitigating measures as would be required on a construction site will be included in the CEMP. The following are the Environmental, Health and Safety Guidelines should be taken into consideration during the construction phase of the project:
 - Selecting equipment with lower sound power levels,
 - Installing suitable mufflers on engine exhausts and compressor components,
 - Re-locate noise sources to areas which are less noise sensitive, to take advantage of distance and natural shielding,
 - Taking advantage during the design stage of natural topography as a noise buffer,

- *Develop a mechanism to record and respond to complaints.*

Indirect impacts:

1. **Mitigation: Air Quality (Fires)** – No open fires will be permitted. Telephone numbers of the fire department must be on hand in case of accidental fires. Staff should be trained to deal with small fires in the hope that these can be prevented from spreading.
2. **Mitigation: Pollution of the Umhlangane River** – Careful monitoring and management of construction vehicles can mitigate this impact. General waste must be removed from the project sites on a daily basis and taken to a designated dumping area for weekly collection (municipal stream) – to be placed in a skip until collection. Construction related waste (rubble etc) must be removed from site on a weekly basis and taken to an approved landfill site designated for this purpose. All spills must be contained and reported to the relevant authorities. Contaminated sand/items associated with a spill must be properly disposed of at a landfill site registered for this purpose. Construction vehicles and machinery are not to be serviced on site. Chemical ablution facilities must be made available to construction workers at a rate of 1 toilet per 10 workers and must be serviced regularly. Ablution facilities may not be situated on unstable ground; within the 1:100 year floodline, or situated too far away from the working front, thereby encouraging workers to relieve themselves in the surrounding environment. Ablution facilities must be regularly flushed and maintained in a good condition, and provide the users with sufficient toilet paper. Mandatory site pollution mitigation measures will be included in the EMP.
3. **Mitigation: Pollution of surrounding areas** – As above and: All litter must be removed from site on a daily basis and stored in sealed skips.

Cumulative impacts:

1. **Mitigation: Improved provision of water will benefit the Surrounding Community** – The proposed construction of the pipeline is advantageous in that the surrounding communities and others in northern Durban will receive an improved (more reliable, better water pressure) water supply, which should be a sustainable supply for the next few decades, (source dependent).

2.3. IMPACTS THAT MAY RESULT FROM THE OPERATIONAL PHASE

a. Site alternatives

List the **potential impacts** associated with site alternatives that are likely to occur during the **operational phase**:

Alternative S1 (preferred alternative)

Direct impacts:

1. **Issue: Provision of Water for Northern Durban** – The proposed construction of the pipeline is advantageous in terms of providing a supply of water for the adjacent community and greater Northern Durban. **Significance Statement:** Medium High Positive Impact (no mitigation required).
2. **Issue: Potential Pipe Rupture** – The method in which the pipeline is constructed (continuously welded steel pipe) and the number of quality and safety tests which the pipe undergoes prior to commissioning almost precludes any kind of catastrophic pipe rupture from occurring. The unthinkable could happen, but is so unlikely as to be of considered a negligible impact. However, should the pipe rupture, it is located some distance from homes along much of the route. In other instances homes may be flooded and other damage may be caused. **Significance Statement:** Medium-High, with mitigation: Low.

Indirect impacts:

N/A

Cumulative impacts:

1. **Issue: Provision of Infrastructure** – The proposed construction is advantageous in terms of providing service infrastructure for the Phoenix and greater Northern Durban area. **Significance Statement:** Medium-High Positive Impact (no mitigation required).

Alternative S2 (if any) N/A

Direct impacts:

Indirect impacts:

Cumulative impacts:

No-go alternative (compulsory)

Direct impacts:

1. **Issue: Provision of Water for Northern Durban** – Should the proposed pipeline not be constructed, the amount and quality of the available water for the community surrounding the project area, and much further afield (all of Northern Durban) will be reduced (compared to this proposal), i.e. it will remain the same. Existing pipelines which are already at carrying capacity, bottlenecked and almost at the end of their design life, will have to suffice. This will result in constraints in development. **Significance Statement:** Medium High, with mitigation: Low

Indirect impacts:

N/A

Cumulative impacts:

N/A

Indicate **mitigation measures** to manage the potential impacts listed above:

Alternative S1

Direct impacts:

1. **Mitigation: Provision of Water for Northern Durban** – The proposed construction of the pipeline is advantageous in terms of providing a supply of water for the adjacent community and greater Northern Durban (no mitigation required).
2. **Mitigation: Potential Pipe Rupture** – The method in which the pipeline is constructed (continuously welded steel pipe) and the number of quality and safety tests which the pipe undergoes prior to commissioning almost precludes any kind of catastrophic pipe rupture from occurring. Welds are x-rayed and if problematic, re-welded and re-x-rayed until an internationally accepted quality result is obtained. NO other construction is permitted near the pipes once installation has been completed. The installation of any other services near the pipe will be required to obtain permission prior to any work commencing, including surveys.

Indirect impacts:

N/A.

Cumulative impacts:

1. **Mitigation: Provision of Infrastructure** – None required.

b. Process, technology, layout or other alternatives

List the **impacts associated** with process, technology, layout or other alternatives that are likely to occur during the **operational phase** (please list impacts associated with each alternative separately):

Alternative A1 (preferred alternative) Impacts do not change based on Technology

Direct impacts:

1. **Issue: Provision of Water for Northern Durban** – The proposed construction of the pipeline is advantageous in terms of providing a supply of water for the adjacent community and greater Northern Durban. **Significance Statement:** Medium High Positive Impact (no mitigation required).
2. **Issue: Potential Pipe Rupture** – The method in which the pipeline is constructed (continuously welded steel pipe) and the number of quality and safety tests which the pipe undergoes prior to commissioning almost precludes any kind of catastrophic pipe rupture from occurring. The unthinkable could happen, but is so unlikely as to be of considered a negligible impact. However, should the pipe rupture, it is located some distance from homes along much of the route. In other instances homes may be flooded and other damage may be caused. **Significance Statement:** Medium-High, with mitigation: Low.

Indirect impacts:

N/A.

Cumulative impacts:

2. **Issue: Provision of Infrastructure** – The proposed construction is advantageous in terms of providing service infrastructure for the Phoenix and greater Northern Durban area. **Significance Statement:** Medium-High Positive Impact (no mitigation required).

Alternative A2 Layout (or route) alternatives will result in the same impacts as those encountered on the preferred route.

Direct impacts:

Indirect impacts:

Cumulative impacts:

No-go alternative (compulsory)

Direct impacts:

1. **Issue: Provision of Water for Northern Durban** – Should the proposed pipeline not be constructed, the amount and quality of the available water for the community surrounding the project area, and much further afield (all of Northern Durban) will be reduced (compared to this proposal), i.e. it will remain the same. Existing pipelines which are already at carrying capacity, bottlenecked and almost at the end of their design life, will have to suffice. This will result in constraints in development. **Significance Statement:** Medium High, with mitigation: Low

Indirect impacts:

N/A

Cumulative impacts:

N/A

Indicate **mitigation measures** to manage the potential impacts listed above:

Alternative A1

Direct impacts:

1. **Mitigation: Provision of Water for Northern Durban** – The proposed construction of the pipeline is advantageous in terms of providing a supply of water for the adjacent community and greater Northern Durban (no mitigation required).
2. **Mitigation: Potential Pipe Rupture** – The method in which the pipeline is constructed (continuously welded steel pipe) and the number of quality and safety tests which the pipe undergoes prior to commissioning almost precludes any kind of catastrophic pipe rupture from occurring. Welds are x-rayed and if problematic, re-welded and re-x-rayed until an internationally accepted quality result is obtained. NO other construction is permitted near the pipes once installation has been completed. The installation of any other services near the pipe will be required to obtain permission prior to any work commencing, including surveys.

Indirect impacts:

N/A

Cumulative impacts:

1. **Mitigation: Provision of Infrastructure** – No mitigation required.

2.4. IMPACTS THAT MAY RESULT FROM THE DECOMMISSIONING OR CLOSURE PHASE

a. Site alternatives

List the **potential impacts** associated with site alternatives that are likely to occur during the **decommissioning or closure phase**:

Alternative S1 (preferred alternative)

Decommissioning of the project site is not expected to occur, but if it were, the following impacts may arise. Decommissioning would imply removal of the pipes and subsequent impacts on both terrestrial and watercourse habitats.

1. **Issue: Generation of dust due to decommissioning activities** – During decommissioning dust may be created due to earthmoving activities. **Significance statement:** Low significance.
2. **Issue: Noise generation** – Decommissioning activities will result in noise generation. The noise levels expected during the decommissioning phase are not known as technology in the future may well have progressed considerably to reduce these levels to a significant degree. Engineering control measures and topography can have an influence on how the noise level is perceived by the receptor some distance from the source. **Significance statement:** Low significance.
3. **Issue: Site safety** – Possible dangers associated with the decommissioning phase on site exist; these include the moving of heavy slabs of concrete and pipes, open trenches, excavations and sharp objects on site which passersby may stumble upon. **Significance statement:** Moderate significance, can be mitigated to low significance.
4. **Issue: Possible disruption of services** – Decommissioning activities may impact on neighbouring communities in terms of noise and dust generation and traffic build up caused by 'construction' vehicles. Furthermore, basic services such as water, electricity and telephone cables could also be affected. **Significance statement:** Low significance.
5. **Issue: On site pollution** – Pollution of the site and surrounding areas caused by litter and oil spills. **Significance statement:** Low significance.
6. **Issue: Damage to access roads by construction vehicles and machinery** – Deconstruction work will involve the movement of vehicles and machinery on residential roads to get to and from the project sites. **Significance statement:** Moderate significance, can be mitigated to low significance.

Indirect impacts:

1. **Issue: Pollution of the Umhlangane River** – Pollution during the decommissioning phase could originate from vehicles (hydrocarbon spills, fumes etc) and other general waste and litter discarded by construction workers or during the process of breaking down the structures to be decommissioned. **Significance statement:** Low significance.

Cumulative impacts:

Alternative S2 N/A

Direct impacts:

Indirect impacts:

Cumulative impacts:

No-go alternative (compulsory)**Direct impacts:** N/A**Indirect impacts:** N/A**Cumulative impacts:** N/AIndicate **mitigation measures** to manage the potential impacts listed above:**Alternative S1**

1. **Mitigation: Generation of dust due to manual excavation and vehicle emissions** – Should dust pollution become a problem during the decommissioning phase, dust amelioration measures (periodic wetting of exposed surfaces) must be put in place. Stripped and cleared areas must be covered / re-vegetated as soon as possible. Hessian or shade cloth should be used on either side of the decommissioned site/s to minimize the movement of dust from the site/s to neighbouring properties. This will serve as an added health and safety feature – in keeping pedestrian traffic off the 'deconstruction' site.
2. **Mitigation: Noise generation** – All 'construction' vehicles must be fitted with a standard muffler to reduce vehicle noise. With moderate effort and a clearly defined EMP, noise generated via decommissioning can be mitigated. Decommissioning times should be adjusted to suitable working hours (8am-5pm). All the usual noise mitigating measures as would be required on a construction site will be included in the CEMP. The following are the Environmental, Health and Safety Guidelines should be taken into consideration during the decommissioning phase of the project:
 - Selecting equipment with lower sound power levels,
 - Installing suitable mufflers on engine exhausts and compressor components,
 - Re-locate noise sources to areas which are less noise sensitive, to take advantage of distance and natural shielding,
 - Develop a mechanism to record and respond to complaints.
3. **Mitigation: Site safety** – Only individuals' utilising construction gear (hard hats, boots, vests) should be allowed on the project sites. All decommissioning activities, products and by-products are to be stored on site according to health and safety regulations. Danger tape (or similar) must be used to deter trespassers off site. Fencing must be erected around all open trenches.
4. **Mitigation: Possible disruption of services** – It is possible that the general decommissioning activities will temporarily disrupt existing service provisions (for example, water or electricity supply), either accidentally or purposefully to achieve the project task. All service infrastructure (above and below ground) such as electrical cables, telephone lines, pipelines etc. must be identified prior to decommissioning occurring on site. Communication must be established with all stakeholders that have service infrastructure in the area prior to decommissioning occurring, and permissions and operating procedures in and around these services must be established. All service infrastructure must be accurately and correctly illustrated on a drawing which is to be available on site throughout the decommissioning phase. The inconvenience of planned service disruption can be reduced through early notification systems and project phasing, as determined by an EMP to be developed at that time.
5. **Mitigation: On site pollution** – Solid waste should be placed in skips on site on a daily basis and disposed of at a suitable facility. All waste skips must be emptied or removed off the site on a weekly basis and taken to a designated registered landfill site. All spills must be contained and reported to the relevant authorities. Contaminated soil/items associated with a spill must be properly disposed of at an appropriate registered landfill site. Construction vehicles and machinery are not to be serviced on site. Chemical ablution facilities must be made available to construction workers at a rate of 1 toilet per 10 workers and must be serviced regularly. Ablution facilities may not be situated on unstable ground or too far away from the working front. Ablution facilities must be: regularly flushed and maintained in a good condition; provide the users with sufficient toilet paper. Mandatory site pollution mitigation measures must be included in the EMP to be developed at the time. Preliminary decommissioning clauses will be developed in the EMP for this current project.
6. **Mitigation: Damage to access roads by construction vehicles and machinery** – All nearby access roads and residential routes used during the decommissioning phase of the project must be inspected prior to decommissioning to determine the possible source of any damage sustained during decommissioning. Damage caused by the decommissioning works should be rehabilitated to a state equal to what was before. This should form part of the 'deconstruction' contract documentation.

Indirect impacts:

1. **Mitigation: Pollution of the Umhlangane River** – Solid waste should be placed in skips on site on a daily basis and disposed of at a suitable facility. These skips must be removed from the site (or emptied) on a weekly basis and taken to a registered landfill site. All spills must be contained and reported to the relevant authorities. Contaminated soil/items associated with a spill must be properly disposed of at an appropriate registered landfill site. Construction vehicles and machinery are not to be serviced on site. Chemical ablution facilities must be made available to construction workers at a rate of 1 toilet per 10 workers and must be serviced regularly. Ablution facilities may not be situated on unstable ground or situated too far away from the working front. Ablution facilities must be regularly flushed & maintained in a good condition, and provide the users with sufficient toilet paper. Mandatory site pollution mitigation measures will be included in the EMP.

Cumulative impacts:

N/A

b. Process, technology, layout or other alternatives

List the **impacts associated** with process, technology, layout or other alternatives that are likely to occur during the **decommissioning or closure phase** (please list impacts associated with each alternative separately):

Alternative A1 (preferred alternative)

Direct impacts: N/A

Indirect impacts: N/A

Cumulative impacts:

1. **Issue: Provision of water** – Should decommissioning occur, a new source of water will need to be provided. **Significance statement:** Moderate Significance

Alternative A2 Layout (or route) alternatives will result in the same impacts as those encountered on the preferred route.

Direct impacts:

Indirect impacts:

Cumulative impacts:

No-go alternative (compulsory)

Direct impacts: N/A

Indirect impacts: N/A

Cumulative impacts: N/A

Indicate **mitigation measures** to manage the potential impacts listed above:

Alternative A1

1. **Mitigation: Provision of water** – Should the pipeline ever be decommissioned, alternative water infrastructure will need to be installed.

2.5. PROPOSED MONITORING AND AUDITING

For each phase of the project and for each alternative, please indicate how identified impacts and mitigation will be monitored and/or audited.

CONSTRUCTION PHASE

Alternative S1 (Site (Preferred))

An Environmental Management Plan (EMP), which includes (but is not necessarily limited to) all impacts and mitigation measures assessed in this Basic Assessment, must be compiled and enforced. Construction activities must be monitored through twice-monthly site visits, and all activities must be audited (by a suitable and independent consultant / specialist) on a monthly basis against the project specific EMP. The results of the monthly audit must be submitted to the relevant environmental authorities and the client to ensure that any negative findings are corrected promptly.

Alternative A1, A2 or A3: Sheet 1- Sheet 8 (Activity / Process Preferred)

The impacts and mitigation will be monitored and/or audited in the same manner as alternative S1.

An Environmental Management Plan (EMP), which includes (but is not necessarily limited to) all impacts and mitigation measures assessed in this Basic Assessment, must be compiled and enforced. Construction activities must be monitored through twice-monthly site visits, and all activities must be audited (by a suitable and independent consultant / specialist) on a monthly basis against the project specific EMP. The results of the monthly audit must be submitted to the relevant environmental authorities and the client to ensure that any negative findings are corrected promptly.

OPERATIONAL PHASE

Alternative S1 (Site Preferred)

The pipeline must be monitored by the eThekweni Water and Sanitation Department to ensure that the system is functioning correctly and safely. Regular maintenance should be undertaken.

Alternative A1, A2 or A3: Sheet 1- Sheet 8 (Activity / Process Preferred)

The impacts and mitigation will be monitored and/or audited in the same manner as alternative S1.

The pipeline must be monitored by the eThekweni Water and Sanitation Department to ensure that the system is functioning correctly and safely. Regular maintenance should be undertaken.

3. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that summarises the **impact** that the proposed activity and its alternatives may have on the environment **after the management and mitigation of impacts have been taken into account**, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the **significance** of impacts.

Alternative **S1** (Preferred **Site**)

Direct impacts:

Socio-Economic

Impact: Removal of Fences/Walls

Likelihood: Medium

Duration: Construction phase.

Significance after mitigation: Low.

Impact: Crops

Likelihood: Low

Duration: Construction phase.

Significance after mitigation: Low.

Impact: Employment

Likelihood: Medium

Duration: Construction phase.

Significance after mitigation: Medium low positive (no mitigation necessary).

Impact: Impact on surrounding residences

Likelihood: Low – Medium

Duration: Construction phase.

Significance after mitigation: Low.

Impact: Visual impact during construction

Likelihood: Low – Medium

Duration: Construction phase.

Significance after mitigation: Low.

Impact: Increase in crime during construction

Likelihood: Low – Medium

Duration: Construction phase.

Significance after mitigation: Low.

Impact: Site Safety

Likelihood: Low – Medium

Duration: Construction phase.

Significance after mitigation: Low.

Biodiversity/Loss of Vegetation

Impact: Storage area Planning

Likelihood: Low

Duration: Short term.

Significance after mitigation: Low.

Impact: Removal of vegetation

Likelihood: Medium

Duration: Short term.

Significance after mitigation: Low.

Impact: Introduction of alien plant species into the construction site

Likelihood: Medium – Low

Duration: Short term

Significance after mitigation: Low.

Impact: Removal of vegetation and disturbance to associated fauna

Likelihood: High

Duration: Short term

Significance after mitigation: Cleared areas will be kept to an absolute minimum, but will be large for a pipeline of this magnitude, both in width and length. The use of a specialist to assess the site immediately prior to construction to rescue any protected or significant fauna and flora (and assist during servitude rehabilitation) will assist in mitigating this impact from moderate significance to low significance.

Impact: Agriculture

Likelihood: Medium – Low

Duration: Short term

Significance after mitigation: Low.

Impact: Road reserves

Likelihood: Low

Duration: Short term

Significance after mitigation: Low.

Impact: Grasslands and Indigenous Vegetation

Likelihood: Medium – High

Duration: Short – Medium Term (until re-established)

Significance after mitigation: Cleared areas will be kept to an absolute minimum. The use of a specialist to assess the site immediately prior to construction to rescue any protected or significant flora (and assist during servitude rehabilitation) will assist in mitigating this impact from moderate significance to medium-low significance.

Impact: Introduction of alien plant species into the project site

Likelihood: Medium – High

Duration: Short – Medium Term

Significance after mitigation: Medium-Low

Impact: Loss of habitat for fauna

Likelihood: Low

Duration: Short term

Significance after mitigation: Low.

Impact: Fauna

Likelihood: Low

Duration: Short term

Significance after mitigation: Low.

Impact: Fire

Likelihood: Low

Duration: Short term

Significance after mitigation: Low.

Land/excavation

Impact: The soil profile

Likelihood: Low – Medium

Duration: Short term

Significance after mitigation: Low.

Impact: Erosion of stockpiles and exposed steep slopes

Likelihood: Low – Medium

Duration: Short term

Significance after mitigation: Low.

Impact: Safety

Likelihood: Low

Duration: Short term

Significance after mitigation: Low.

Impact: Pests

Likelihood: Low

Duration: Short term

Significance after mitigation: Low.

Water

Impact: Rivers/streams Crossings

Likelihood: Medium

Duration: Short term

Significance after mitigation: Moderate to Low

Impact: Storm Water Drains

Likelihood: Low

Duration: Short term

Significance after mitigation: Medium-Low.

Impact: Ground water – No impacts expected.

Access/Traffic

Impact: Access roads
Likelihood: High
Duration: Short term
Significance after mitigation: Moderate

Waste

Impact: General waste
Likelihood: Medium
Duration: Short term
Significance after mitigation: Low.

Impact: Construction waste
Likelihood: Medium
Duration: Short term
Significance after mitigation: Low.

Impact: Sewage/effluent
Likelihood: Low
Duration: Short term
Significance after mitigation: Low.

Impact: Litter
Likelihood: Low – Medium
Duration: Short term
Significance after mitigation: Low.

Air Quality

Impact: Dust
Likelihood: Low – Medium
Duration: Short term
Significance after mitigation: Low.

Impact: Exhaust emissions
Likelihood: Low
Duration: Short term
Significance after mitigation: Low.

Impact: Noise
Likelihood: Medium
Duration: Short term
Significance after mitigation: Low.

Indirect impacts:

Impact: Air Quality (Fires)
Likelihood: Low – Medium
Duration: Construction phase.
Significance after mitigation: Low.

Impact: Pollution of the Umhlangane River
Likelihood: Low – Medium
Duration: Construction phase.
Significance after mitigation: Negligible

Impact: Pollution of surrounding areas
Likelihood: Low
Duration: Construction phase.
Significance after mitigation: Low.

Cumulative impacts:

Impact: Improved provision of water and infrastructure will benefit the Surrounding Community
Likelihood: High
Duration: Permanent
Significance after mitigation: Medium High Positive Impact (no mitigation required).

In summary, most of the impacts identified for the construction and operational phases were rated as having LOW overall significance.

Alternative S2 N/A

Alternative A1 (preferred Alternative)

Direct impacts:

Socio-Economic

Impact: Removal of Fences/Walls

Likelihood: Medium

Duration: Construction phase.

Significance after mitigation: Low.

Impact: Crops

Likelihood: Low

Duration: Construction phase.

Significance after mitigation: Low.

Impact: Employment

Likelihood: Medium

Duration: Construction phase.

Significance after mitigation: Medium low positive (no mitigation necessary).

Impact: Impact on surrounding residences

Likelihood: Low – Medium

Duration: Construction phase.

Significance after mitigation: Low.

Impact: Visual impact during construction

Likelihood: Low – Medium

Duration: Construction phase.

Significance after mitigation: Low.

Impact: Increase in crime during construction

Likelihood: Low – Medium

Duration: Construction phase.

Significance after mitigation: Low.

Impact: Site Safety

Likelihood: Low – Medium

Duration: Construction phase.

Significance after mitigation: Low.

Biodiversity/Loss of Vegetation

Impact: Storage area Planning

Likelihood: Low

Duration: Short term.

Significance after mitigation: Low.

Impact: Removal of vegetation

Likelihood: Medium

Duration: Short term.

Significance after mitigation: Low.

Impact: Introduction of alien plant species into the construction site

Likelihood: Medium – Low

Duration: Short term

Significance after mitigation: Low.

Impact: Removal of vegetation and disturbance to associated fauna

Likelihood: High

Duration: Short term

Significance after mitigation: Cleared areas will be kept to an absolute minimum, but will be large for a pipeline of this magnitude, both in width and length. The use of a specialist to assess the site immediately prior to construction to rescue any protected or significant fauna and flora (and assist during servitude rehabilitation) will assist in mitigating this impact from moderate significance to low significance.

Impact: Agriculture

Likelihood: Medium – Low

Duration: Short term

Significance after mitigation: Low.

Impact: Road reserves

Likelihood: Low

Duration: Short term

Significance after mitigation: Low.

Impact: Grasslands and Indigenous Vegetation

Likelihood: Medium – High

Duration: Short – Medium Term (until re-established)

Significance after mitigation: Cleared areas will be kept to an absolute minimum. The use of a specialist to assess the site immediately prior to construction to rescue any protected or significant flora (and assist during servitude rehabilitation) will assist in mitigating this impact from moderate significance to medium-low significance.

Impact: Introduction of alien plant species into the project site

Likelihood: Medium – High

Duration: Short – Medium Term

Significance after mitigation: Medium-Low

Impact: Loss of habitat for fauna

Likelihood: Low

Duration: Short term

Significance after mitigation: Low.

Impact: Fauna

Likelihood: Low

Duration: Short term

Significance after mitigation: Low.

Impact: Fire

Likelihood: Low

Duration: Short term

Significance after mitigation: Low.

Land/excavation

Impact: The soil profile

Likelihood: Low – Medium

Duration: Short term

Significance after mitigation: Low.

Impact: Erosion of stockpiles and exposed steep slopes

Likelihood: Low – Medium

Duration: Short term

Significance after mitigation: Low.

Impact: Safety

Likelihood: Low

Duration: Short term

Significance after mitigation: Low.

Impact: Pests

Likelihood: Low

Duration: Short term

Significance after mitigation: Low.

Water

Impact: Rivers/streams Crossings

Likelihood: Medium

Duration: Short term

Significance after mitigation: Moderate to Low

Impact: Storm Water Drains

Likelihood: Low

Duration: Short term

Significance after mitigation: Medium-Low.

Impact: Ground water – No impacts expected.

Access/Traffic

Impact: Access roads

Likelihood: High

Duration: Short term

Significance after mitigation: Moderate

Waste

Impact: General waste

Likelihood: Medium

Duration: Short term

Significance after mitigation: Low.

Impact: Construction waste

Likelihood: Medium

Duration: Short term

Significance after mitigation: Low.

Impact: Sewage/effluent

Likelihood: Low

Duration: Short term

Significance after mitigation: Low.

Impact: Litter

Likelihood: Low – Medium

Duration: Short term

Significance after mitigation: Low.

Air Quality

Impact: Dust

Likelihood: Low – Medium

Duration: Short term

Significance after mitigation: Low.

Impact: Exhaust emissions

Likelihood: Low

Duration: Short term

Significance after mitigation: Low.

Impact: Noise

Likelihood: Medium

Duration: Short term

Significance after mitigation: Low.

Indirect impacts:

Impact: Air Quality (Fires)

Likelihood: Low – Medium

Duration: Construction phase.

Significance after mitigation: Low.

Impact: Pollution of the Umhlangane River

Likelihood: Low – Medium

Duration: Construction phase.

Significance after mitigation: Negligible

Impact: Pollution of surrounding areas

Likelihood: Low

Duration: Construction phase.

Significance after mitigation: Low.

Cumulative impacts:

Impact: Improved provision of water and infrastructure will benefit the Surrounding Community

Likelihood: High

Duration: Permanent

Significance after mitigation: Medium High Positive Impact (no mitigation required).

In summary, most of the impacts identified for the construction and operational phases were rated as having LOW overall significance.

Alternative A2 & A3 (Sheet 6)

Same as above

No-go alternative (compulsory)

Impact: Non-Provision of Water Infrastructure

Significance Statement: Medium

SECTION F. RECOMMENDATION OF EAP

Is the information contained in this report and the documentation attached hereto in the view of the EAPr sufficient to make a decision in respect of this report?

If "NO", please contact the KZN Department of Agriculture, Environmental Affairs and Rural Development regarding the further requirements for your report.

YES ✓	NO

If "YES", please attach the draft EMPr as Appendix F to this report and list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application:

1. A project specific Environmental Management Programme (EMP) should be compiled according to (but not limited to) the impacts and mitigation measures included in this assessment.
2. The EMP compliance should be monitored on a twice-monthly basis and is audited on a monthly basis.
3. Continued offences of the EMP on the part of the Contractor should be reported to the eThekweni Environmental Branch for further action.
4. In accordance to the Biodiversity Specialist Report, Dr Granger found no Dwarf Chameleons, but suggested that a specialist / KZNW review his report and advise whether these species may be present, considering the habitat which he found to be present. The biodiversity report was submitted to Ezemvelo Wildlife and has been reviewed. We request that KZNW advise us how to proceed regarding the Dwarf Chameleon concern.
5. Ablution facilities must be made available to construction workers at a rate of 1 toilet per 10 workers. Ablution facilities may not be situated on unstable ground, within the 1:100 floodline, or situated too far away from the working front. Ablution facilities must be adequately maintained.
6. Communications between the Contractor and all Stakeholders must be established before construction begins
7. All significant spills or leaks are to be reported to the relevant environmental authority. All spills and leaks to be cleaned up and removed from site immediately after occurring.
8. The construction activity must be overseen by a competent supervisor to ensure that any potential for poor workmanship (and the resultant pollution of surface/ground water and soil) is minimized.
9. Use dust suppression techniques as appropriate.
10. The clearing of vegetation should be limited as far as possible.
11. On site vegetation outside of the development footprint, may not be impacted on in any way without permission from the ECO or a vegetation specialist.
12. Any impact on surrounding or riparian vegetation must be rehabilitated. Where riparian vegetation is expected to be affected, ecologically significant plant material should be rescued from the site prior to construction beginning, to be utilised during rehabilitation.
13. Erosion measures must be set in place prior to construction commencing.
14. Potentially polluting substances should be stored appropriately.
15. Littering must be prohibited; rubbish bins must be provided and emptied regularly.

SECTION G: APPENDIXES

The following appendixes must be attached as appropriate:

Appendix A: Site plan(s)

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports

Appendix E: Comments and responses report

Appendix F: Draft Environmental Management Programme (EMPr)

Appendix G: Other information