edtea
Department :
Economic Development, Tourism and Environmental Affairs
PROVINCE OF KWAZULU-NATAL

	(For official use only)
EIA File Reference Number:	DC/
NEAS Reference Number:	KZN/EIA/
Waste Management Licence Number: (if applicable)	
Date Received:	

BASIC ASSESSMENT REPORT

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

This template may be used for the following applications:

- **Environmental Authorization** subject to basic assessment for an activity that is listed in Listing Notices 1or 3, 2010 (Government Notices No. R 544 or No. R 546 dated 18 June 2010); or
- **Waste Management Licence** for an activity that is listed in terms of section 20(b) of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) for which a basic assessment process as stipulated in the EIA Regulations must be conducted as part of the application (refer to the schedule of waste management activities in Category A of Government Notice No. 718 dated 03 July 2009).

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 Economic Development, Tourism & Environmental Affairs. 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 Economic Development, Tourism & Environmental Affairs 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 Economic Development, Tourism & Environmental Affairs to which the application has been allocated (please refer to the details provided in the letter of acknowledgement for this application).**

DEPARTMENTAL REFERENCE NUMBER(S)

File reference number (EIA):	
File reference number (Waste Management Licence):	

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:	Terratest (Pty) Ltd		
Physical address:	John Jeffares House, 6 Pin Oak Avenue, Hilton, 3201		
Postal address:	P. O. Box 794, Hilton		
Postal code:	3245	**Cell:**	
Telephone:	033 343 6789	**Fax:**	033 343 6788
E-mail:	strydomt@terratest.co.za		

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)
Magnus van Rooyen	BSc Hons; MPhil (Env. Man.)	IAIA sa	9 Years
Theo Wicks	BSc Hons; MPhil (Env. Man.)	IAIA sa	7 Years
Tarin Strydom	BSocSc (Geog. and Env. Man.)	IAIA sa	4.5 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
Jake Alletson	BSC (Biological Science) BSC Hons (Zoology)	Ecological Scientist	4.Groundcover	Ufafa Water Supply Scheme Comment On Biodiversity In

				The Project Area.
Mr C. Isherwood	BSc (Hons) Engineering Geology	Geotechnical	3. Groundwater, Soil And Geological Stability of The Site.	None.

SECTION B: ACTIVITY INFORMATION

1. PROJECT TITLE

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

The proposed construction of the Ufafa Water Supply Scheme.

2. PROJECT DESCRIPTION

Provide a detailed description of the project:

The Ufafa Water Supply Project forms part of the Sisonke District Municipality's Regional and Sub-regional plan for supplying potable water to areas which have not had access to safe drinking water and conforms to the standards as set down by the Reconstruction and Development Programme.

The proposed project will entail the following:

- The construction of the water reticulation network to approximately 1 060 households as identified from recent orthophotos;
- The construction of a new 4 000 m bulk main to the area with associated reticulation estimated to be approximately 69 900 m;
- The construction of one 1 ml reservoir to serve the project area;
- The construction of supply points to supply the households within a 200 m radius;
- The construction of break pressure tanks;
- The construction of a pipe bridge over the Lufafa River;
- The network will include for air valves, isolating valves and scour valves. Isolating Valves will be located to minimise the effect of closure on the supply and to suit Scour activities;
- Bulk meters will be provided at the boundary of each distinct supply zone;
- The networks are designed to cater for an ultimate demand of 60 l/c/day although
- only communal standpipes will be provided for in terms of this Technical Report;
- It is envisaged that yard connections will be installed and paid for by the payment of a connection fee. Municipal Infrastructure Grant (MIG) funds will be utilised to provide community dispensing units only where required.

3. ACTIVITY DESCRIPTION

Describe each listed activity in Listing Notice 1 (GNR 544, 18 June2010), Listing Notice 3 (GNR 546, 18June 2010) or Category A of GN 718, 3 July 2009 (Waste Management Activities) which is being applied for as per the project description:

GNR 544, 18 June 2010

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.

The project involves approximately 4km of rising main, the diameter of which may be in excess of 0.36 m and outside of a road reserve.

GNR 544, 18 June 2010
11. The construction of:

(iii) bridges; and
(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.

On perusing the project alignment against the DWA river and drainage line databases the proposed route will include approximately 123 watercourse crossings which are likely to require infrastructure being constructed which will be greater than 50m² within 32 metres of their boundaries. This activity will therefore be triggered.

GNR 544, 18 June 2010
18. The infilling or depositing of any material of more than 5 cubic meters into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock or more than 5 cubic meters from:

(i) A watercourse;

But excluding where such infilling, depositing, dredging excavation, removal or moving:

(a) Is for maintenance purposes undertaken in accordance with a management plan agreed to by the relevant authority; or
(b) Occurs behind the development setback line.

The project implementation will require that pipelines be placed in excavated trenches through watercourses.

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—
(a) the property on which or location where it is proposed to undertake the activity;
(b) the type of activity to be undertaken;
(c) the design or layout of the activity;
(d) the technology to be used in the activity;
(e) the operational aspects of the activity; and
(f) 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.

At a conceptual level, two different layout concepts were considered.

The preferred option

The preferred option which is being proposed is to following the alignment of the existing access roads. This is preferred because:

- The alignment will follow an existing line of disturbance and does not imply the segmentation of additional biomes;
- The availability of road access allows for easier access during construction;
- It does not require the development of any construction access roads thus limiting the construction footprint and the area to be rehabilitated;
- Easier access allows for quicker implementation;
- It does not require the maintenance of a service road in order to operate the system; and
- Lesser social impacts as the alignment does not require the traversing of cultivated areas or require resettlements.

The alternative option

The alternative option is to deviate from the road alignment and follow a greenfields alignment. While this option may provide a minor cost savings in terms of material, this saving would be offset by the increase in time required for implementation, rehabilitation expenses associated with an increased footprint.

The risk for environmental degradation would also be increased as it would require an extended area to be disturbed.

At a preliminary stage, the use of alternative materials were also considered. These were excluded based on them either not being able to meet engineering design requirements or costs.

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:	**Latitude (S):**			**Longitude (E):**		
Alternative S1[1] (preferred or only site alternative)	o	‘	“	o	‘	“
Alternative S2 (if any)	o	‘	“	o	‘	“
Alternative S3 (if any)	o	‘	“	o	‘	“

In the case of linear activities:

Alternative:	**Latitude (S):**			**Longitude (E):**		
Alternative S1 (preferred or only route alternative)	Please refer to Appendix G					
• Starting point of the activity	30o	03‘	56.82“	30o	08‘	32.94“
• Middle point of the activity	30o	02‘	4.34“	30o	06‘	31.17“
• End point of the activity	30o	03‘	15.95“	30o	02‘	55.85“
Alternative S2 (if any)			“			“
• Starting point of the activity	o	‘	“	o	‘	“
• Middle point of the activity	o	‘	“	o	‘	“
• End point of the activity	o	‘	“	o	‘	“
Alternative S3 (if any)			“			“
• Starting point of the activity	o	‘	“	o	‘	“
• Middle point of the activity	o	‘	“	o	‘	“
• End point of the activity	o	‘	“	o	‘	“

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.

Please see Appendix A.

6. PHYSICAL SIZE OF THE ACTIVITY

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

Alternative:	**Size of the activity:**
Alternative A1[2] (preferred activity alternative)	m^2
Alternative A2 (if any)	m^2
Alternative A3 (if any)	m^2

or, for linear activities:

Alternative:	**Length of the activity:**
Alternative A1 (preferred activity alternative)	36 070 000 m
Alternative A2 (if any)	m
Alternative A3 (if any)	m

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

[1] “Alternative S..” refer to site alternatives.
[2] “Alternative A..” refer to activity, process, technology or other alternatives.

Alternative:	**Size of the site/servitude:**
Alternative A1 (preferred activity alternative)	m^2
Alternative A2 (if any)	m^2
Alternative A3 (if any)	m^2

7. SITE ACCESS

Does ready access to the site exist?	YES	NO
If NO, what is the distance over which a new access road will be built		m

Describe the type of access road planned:

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.

Please see Appendix B.

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.

Please see Appendix C.

11. ACTIVITY MOTIVATION

As this project lends itself towards labour intensive construction methods, preference will be given to labour intensive methodology where practically possible. Extensive use will be made of locally available Previously Disadvantaged Company and Previously Disadvantaged Individual and contract documents will specify that 100% of the contractors' unskilled labour force is to be sourced from the local communities. During construction, labour-based construction will be used for sections of the work that are suitable for this type of work. These sections will include (but not necessarily be confined to):

- clearing of pipeline routes;
- trenching and backfilling of trenches (excavation of rock will require blasting);
- laying of uPVC and HDPE pipework;
- construction of manholes, valve chambers etc;
- construction and installation of dispensing units;
- construction of pay points, stores and workshops;
- steel fixing, shutter hand work and concrete work;
- fencing and landscaping around structures;
- topsoiling and grassing;
- stormwater control measures.

A target of 30 % involvement of women during the construction phase is envisaged.

11.1. Socio-economic value of the activity

What is the expected capital value of the activity on completion?	R 42,744,569	
What is the expected yearly income that will be generated by or as a result of the activity?	Unknown at this stage	
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?	Unknown at this stage	

What is the expected value of the employment opportunities during the development phase?	Unknown at this stage
What percentage of this will accrue to previously disadvantaged individuals?	100 %
How many permanent new employment opportunities will be created during the operational phase of the activity?	at least 2 Operators and 3 General Hands
What is the expected current value of the employment opportunities during the first 10 years?	R100 000.00 and R700 000 is to be assumed for each Operator and General Hand respectively
What percentage of this will accrue to previously disadvantaged individuals?	100 %

11.2. Need and desirability of the activity

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

There is an urgent need for safe potable water supply to 1 060 (direct) households. The sources of water presently available to the 1 060 households are rivers and boreholes with poor quality water. Women and children are forced to walk long distances to collect water from these sources, which is at times unsuitable for human consumption. In the past, Cholera cases have been reported in the area;

Job opportunities (a large portion of the economically active population is currently unemployed);

Economic empowerment (low monthly average income per month/households);

Institutional empowerment through training.

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

The aim of the project is to provide approximately 5 506 (direct) living in 1 060 households with a supply of potable water. The communities within the project area presently use rivers, boreholes and springs for the supply of water. These are not reliable and are susceptible to waterborne diseases;

To ensure a level of cost recovery, by work-shopping the concepts and proposals with the communities, and by putting appropriate systems in place;

To consult the communities and encourage their participation at all stages of the project to ensure that the structures such as the Water Service Authority (Sisonke District Municipality) and the Water Service Provider (Sisonke District Municipality) are fully supported as well as the programme of implementation of the project;

To promote health and hygiene awareness to the communities within the project area;

To uplift the communities through the creation of job opportunities during the construction phase;

To build capacity by allowing community participation in the management and decision-making aspects of the project as well as providing skills training;

To create an awareness of the local environment and the importance of protecting potable water which is a scarce resource in Southern Africa.

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

This project will directly provide 1 060 households consisting of 5 506 people with a basic level of supply of 25 l/c/d. Future phases of the project will be the natural progression towards expanding the provision of safe, reliable potable water to a larger number of beneficiaries within the project area;

The recipient communities have indicated that there is a prevalence of waterborne related diseases. This is directly related to the lack of a safe potable water supply in the area;

The cost recovery model to be implemented will be as per the Sisonke District Municipality tariff structures;

There are no suitable alternative sources of bulk potable water to the area;

The project is in accordance with the Sisonke Masterplan titled "Feasibility Studies for Regional Water Supply Schemes in the Sisonke DM Area", dated 31 October 2007, and prepared by Makhaotse, Narasimulu & Associates in association with Ninham Shand.

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 Water Act (Act No 36 of 1998)	Department of Water Affairs (DWA)	1998
National Environmental Management Act (Act No 107 of 1998 [NEMA]) as amended	DEA	1998
National Heritage Resources Act (Act No 25 OF 1999)	South African Heritage Resources Agency (SAHRA)/ Amafa AkwaZulu-Natali (Amafa)	1999
National Environmental Management – Waste Act (Act 59 of 2008)	Department of Agriculture, Environmental Affairs (DAEA) / DEA	2008
KwaZulu-Natal / National Road Traffic Act (Act 93 of 1996)	KZN Department of Transport	1996

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?	< 5 m^3	

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

Waste will be collected on site in waste receptacles and assimilated at the construction camp. Waste will be collected on a weekly basis from the site camps and temporarily stored at the construction contractor's yard. It will then be disposed of at the nearest licensed landfill facility. Alternatively the waste will be disposed of at the Ixopo Landfill Facility rather than being sent to the yard.

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

Ixopo Landfill Facility

Will the activity produce solid waste during its operational phase?	YES	NO
If yes, what estimated quantity will be produced per month?		m^3

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

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

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 Economic Development, Tourism & Environmental Affairs 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 Economic Development, Tourism & Environmental Affairs 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?		m^3
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 Economic Development, Tourism & Environmental Affairs 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:

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:

It is expected that general domestic waste will provide the majority of the waste generated. The opportunity to reuse or recycle this material is therefore dependent upon facilities being available at the landfill to process such materials. Damaged steel pipe may be sent for recycling.

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 Economic Development, Tourism & Environmental Affairs to obtain clarity regarding the process requirements for your application.

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

Emissions will take the form of dust and engine emissions that will result from the operation of vehicles and construction equipment on site. This will be limited to the construction phase of the project and will not continue during the operational phase. Mitigation measures for such emissions are included in the site specific Environmental Management Programme (EMPr).

13.4. Generation of noise

Will the activity generate noise?	YES	NO
If yes, is it controlled by any legislation of any sphere of government?	YES	NO

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 produced will be from vehicles and equipment and will be limited to the construction phase. No noise will be generated during the operational phase.

14. WATER USE

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

municipal	water board	groundwater	river, stream, dam or lake	other	the activity will not use water

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: litres

Does the activity require a water use permit from the Department of Water Affairs?	YES	NO

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

Water is to be sourced from the existing municipal water supply.

15. ENERGY EFFICIENCY

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

The project plan for implementation is to utilise labour intensive methods in order to create maximum benefit for the local skilled and unskilled members.

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

None are available as the project promotes labour intensive construction methods.

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):	1

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

1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Alternative S1:

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

Alternative S2 (if any):

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

Alternative S3 (if any):

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)**.

Alternative S1 (preferred site):

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

Alternative S2 (if any):

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

Alternative S3 (if any):

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:	Mr C. Isherwood		
Qualification(s) of the specialist:	BSc (Hons) Engineering Geology		
Postal address:	PO Box 794 Hilton		
Postal code:	3234		
Telephone:	033 343 6789	Cell:	
E-mail:	isherwoodc@jgi.co.za	Fax:	033 343 6788
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 their any special or sensitive habitats or other natural features present on any of the alternative sites?		YES	NO
If YES, specify and explain:	According to the 1:250 000 Geological Map Series, 3030, Port Shepstone, the study area is underlain by dark-grey shale, carbonaceous shale, siltstone of the Pietermaritzburg Formation which is overlain by medium to coarse-grained feldspathic sandstone, grit, subordinate grey shale and siltstone of the Vryheid Formation, both belonging to the Ecca Group of the Karoo Supergroup. Post-Karoo intrusives dolerite sills and dykes were also intersected during the investigation. From the field investigation it was determined that the subsurface geology comprised both parental sandstone bedrock of the Vryheid Formation and dolerite bedrock of the Post Karoo Intrusive Suite. Dolerite bedrock was overlain in most instances by residual dolerite of silty CLAY composition which in turn is overlain by colluvial silt. At trial pit positions UTP15 and UTP18, sandstone bedrock is overlain directly by residual sandstone of silty CLAY composition which in turn is overlain by colluvial silty SAND. Surface dolerite boulders were encountered along a large portion of the pipeline route. The sandstone bedrock generally occurs as thinly bedded with moderately to widely spaced jointing and will be rippable with an excavator, such as a 30 ton class excavator, whereas the dolerite bedrock generally occurs in a highly fractured state and will be rippable with an excavator of similar capacity.		

	No natural ground water seepage was noted in any of the trial pits. Groundwater seepage is not expected to be problematic at shallow depths on this site however there is a good possibility that this may change during periods of high precipitation, especially towards the lowermost portions of the pipeline route i.e. adjacent to the Lufafa River

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:  Date: 15/10/2014

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

	Alternative S1:		Alternative S2 (if any):		Alternative S3 (if any):	
Shallow water table (less than 1.5m deep)	YES	NO	YES	NO	YES	NO
Dolomite, sinkhole or doline areas	YES	NO	YES	NO	YES	NO
Seasonally wet soils (often close to water bodies)	YES	NO	YES	NO	YES	NO
Unstable rocky slopes or steep slopes with loose soil	YES	NO	YES	NO	YES	NO
Dispersive soils (soils that dissolve in water)	YES	NO	YES	NO	YES	NO
Soils with high clay content (clay fraction more than 40%)	YES	NO	YES	NO	YES	NO
Any other unstable soil or geological feature	YES	NO	YES	NO	YES	NO
An area sensitive to erosion	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. GROUNDCOVER

Has a specialist been consulted for the completion of this section?			YES	NO
If YES, please complete the following:				
Name of the specialist:	Jake Alletson			
Qualification(s) of the specialist:	BSC (Biological Science) BSC Hons (Zoology)			
Postal address:	PO Box 794 Hilton			
Postal code:	3234			
Telephone:	033 343 6789	Cell:		
E-mail:	alletsonj@jgi.co.za	Fax:	033 343 6788	
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:	"Examination of the layout of the proposed water reticulation system shows that the greater part of it lies along existing roads and tracks. Thus the potential for environmental impacts is substantially reduced as such places are typically degraded due to high levels of human utilisation. However, close examination of the routes as presently indicated suggests that there are a number of places where the proposed lines will pass through patches of natural vegetation. See Figure 3. Most such places include woody vegetation where a line passes down a slope and may well be associated with a drainage line somewhere in the vicinity. However, a few do pass through grassland areas. The impacts in such places will relate to damage to the vegetation and to the associated fauna. In addition the Lufafa River and some of its tributaries are crossed at points where there is no bridge or other structure to carry the line. Clearly the construction works at such sites could lead to quantities of sediment being released into the aquatic environment downstream of the site. The Environmental Management Plan (EMP) for the project must take cognisance of the possible impacts on the vegetation and the river/stream crossings. It is recommended that, when the final alignment of the various pipelines has been established, the Environmental Consultant must determine all such sites and map them. It is unlikely that, with the exception of the two large crossings, site specific instructions will be needed. Instead generic guidelines relating to vegetation clearing, soil handling, and rehabilitation will suffice. Within the indicated sites it is possible that the development could impact on one or more of the designated species of concern. The Blue Swallow is the species of highest concern (Critically Endangered) but it is unlikely to be affected to any noticeable degree. The nest sites are located within the Biodiversity Priority Area 1 sites and the pipelines only intrude at one point. If there were a known site there the Priority Area would include it. There is a slight possibility that the pipeline construction process may affect the foraging ranges of the birds. However, this impact would be limited in time and would only last for a single season. More likely to be affected is the Lymnaeid Awl Snail since it occurs in a variety of habitats ranging from forests to open grassland. However, it is not common and it is highly unlikely that any will be affected. For this reason it is not suggested that searches for it are undertaken with the view to carrying out translocations. The EMP must give some guidelines in relation to these species. Most important will be that construction work on any pipelines within 750 m of an active Blue Swallow nest should not be undertaken during the nesting season (October – March) since the birds will be most active in their feeding at this time. This study has found no fatal flaws in regard to biodiversity in the proposed pipeline development project. Despite this, there is some potential for impacts to happen and these must be identified and be included into the EMP prior to the start of construction." See Appendix D: Ufafa Water Supply Scheme Comment on Biodiversity In The Project Area.
Are their any special or sensitive habitats or other natural features present on any of the alternative sites?	YES / NO

If YES, specify and explain:	"The EMP must give some guidelines in relation to these species. Most important will be that construction work on any pipelines within 750 m of an active Blue Swallow nest should not be undertaken during the nesting season (October – March) since the birds will be most active in their feeding at this time." See Appendix D: Ufafa Water Supply Scheme Comment on Biodiversity In The Project Area.		
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:		Date:	15 October 2014

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	The area is interspersed with natural grasslands and drainage lines with associated riparian vegetation. The alignment predominantly follows the road thus having a limited impact on the natural vegetation.
Low density residential	YES	NO	
Medium density residential	YES	NO	
High density residential	YES	NO	
Informal residential	YES	NO	The project area fall within a traditional authority area. The residents of these dwellings are the beneficiaries of the project.
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	There is a school in the western portion of the project site. The proposed project will supply the school.
Tertiary education facility	YES	NO	
Church	YES	NO	Near to the school mentioned above is a church. This will not be impacted upon by the proposed project.
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	There are wattle and gum plantations located to the west of the project area. These will not be affected by the project
Agriculture	YES	NO	Subsistence agriculture is being practised in the region. The alignment follows the road alignment, thus there should not be any impact on these plots.
River, stream or wetland	YES	NO	The pipelines will traverse a number of watercourses (both perennial and non-perennial). These watercourse crossings will be impacted upon during the construction phase as the pipelines will either be constructed on pipe bridges or will be placed on the river bed.
Nature conservation area	YES	NO	
Mountain, hill or ridge	YES	NO	The region is characterised by steep topography. The risk of visual impact is largely associated with the construction phase following which there will be none apart from the reservoir. Soil erosion because of the topography is a risk that will require management during the construction phase until adequate rehabilitation has been achieved.
Museum	YES	NO	
Historical building	YES	NO	
Protected Area	YES	NO	
Graveyard	YES	NO	
Archaeological site	YES	NO	

Other land uses (describe)	YES	NO	

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
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:		
Will any building or structure older than 60 years be affected in any way?	YES	NO
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?	YES	NO
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 Economic Development, Tourism & Environmental Affairs 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 Economic Development, Tourism & Environmental Affairs 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.

Advertisements announcing the project and the environmental process to be followed were placed in The Mercury and Isolezwe on the 8th October 2014. Site Notices were erected on the 25th August 2014 and Background Information Documents (BIDs) were distributed on the 6th October 2014 via email and registered mail. E-mails with project maps and BID documents were forwarded to key stakeholders and the local Municipality. There was, however, very limited response to the advertisements and Background Information Documents.

Appendix B Photographs illustrate the on-site Notices placed.
Appendix E contains the Comments and Response Report detailing all Interested and Affected Parties (IAP) contact and correspondence, as well as the advertisements

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 District Municipality is the applicant		

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):		

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):		

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):

None at this stage.

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.

None at this stage.

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):

None at this stage.

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:

- Trial Pits

Disturbance of flora, potential loss of fauna, soil loss.

- Surveys

Disturbance of flora, potential loss of fauna, soil loss.

- Site inspections

Disturbance of flora, potential loss of fauna, soil loss.

- Job Creation

Creation of skilled jobs for professional planners, designers, engineers, local liaison officers etc.

Indirect impacts:

- Potential soil erosion

- watercourse crossings

Inappropriate design of the crossing points could result in ineffective and inefficient watercourse crossings which do not meet the needs of the community and which have adverse environmental impacts. It is the opinion of the EAP and the Project Engineers that the preferred watercourse crossing types have been appropriately designed.

Cumulative impacts:

- Loss and disturbance of flora, fauna and soil
- Ineffective and inefficient watercourse crossings

Alternative S2 (if any)

Direct impacts:

Indirect impacts:

Cumulative impacts:

No-go alternative (compulsory)

Direct impacts:

Without planning and design the project cannot be implemented.

Indirect impacts:

Communities will not benefit from a reliable and safe source of water.

Cumulative impacts:

Communities will remain at risk of contracting waterborne illnesses and have to depend on an unreliable water source.

Indicate mitigation measures to manage the potential impacts listed above:

Alternative S1	**Alternative S2**
Any excavations are to be demarcated with danger tape. When excavating, the topsoil (top 150mm of soil) is to be removed and placed separately from the remainder of the material. The excavations are to be backfilled with the topsoil being replaced last. Any soil sods collected during the clearing are to be replanted.	

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:

None

Indirect impacts:

None

Cumulative impacts:

None

Alternative A2 (if any)

Direct impacts:

None

Indirect impacts:

None

Cumulative impacts:

None

No-go alternative (compulsory)

Direct impacts: None *Indirect impacts:* None *Cumulative impacts:* None

Indicate mitigation measures to manage the potential impacts listed above:

Alternative A1:	**Alternative A2:**
No impacts have been identified therefore mitigation measures are not required.	No impacts have been identified therefore mitigation measures are not required.

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:

Soils

During the construction phase, soils will be excavated and cleared for the pipeline and reservoir constructions. Potential disturbances include compaction, physical removal and potential pollution by hydrocarbons. Furthermore, if standard stormwater control measures are not implemented during the construction phase, soil erosion and subsequent removal of vegetation may occur.

Vegetation and fauna

During the construction phase vegetation will be cleared for the construction of the pipelines and associated infrastructure. This amount however will be minimal because the scheme will be found within existing road servitudes, on footpaths, and generally areas that have been impacted upon already.

Surface water

Clearing of vegetation during the construction phase will increase surface runoff and therefore adequate stormwater measures will need to be implemented. Waste generated during the construction phase may enter the environment through surface water runoff.

Air quality and Noise Pollution

Dust generation from stockpiles and soil stripping, vehicle traffic on dirt roads and motor vehicle fumes will have an impact on air quality. During the construction phase, the operation of machinery and equipment, as well as the construction vehicle traffic will increase noise levels.

Cultural and Historical

No heritage resources were observed within or adjacent to the proposed development area during the site assessment. Should any heritage resources, as defined in the National Heritage Resources Act 25 of 1999, be discovered during the course of development activities, the developer must cease all work immediately, and adhere to the protocol set out below (see recommendations).

Visual
The project involves the expansion of existing infrastructure as well as the construction of further infrastructure. Limited visual impacts are expected due to the fact that aesthetics are being considered in the design phase.

Traffic
An increase in heavy vehicle (construction vehicles) traffic will be limited to the construction period.

Socio-Economic
Construction in the area is expected to have a positive impact on the area and local community as it will provide employment opportunities during the construction phase.

Indirect impacts:

Soils
Insufficient stormwater control measures may result in localised high levels of soil erosion, possibly creating dongas or gullies, which may lead to decreased environmental health and water quality.

Vegetation and Fauna
Increase in alien invasive species, therefore a possible loss in biodiversity.

Cumulative impacts:

Soils
Soil erosion implies the loss of soils which could cumulate in the loss of agricultural land, losses in biodiversity and sedimentation.

Vegetation and Fauna
Without management, the disturbance associated with the proposed development may result in the propagation of alien vegetation.

Surface Water
Soil erosion may result in increased sediment load in the watercourses. This could lead to a decrease in water quality.

Air Quality
Dusts has a potential nuisance risk and social impact.

Traffic
An increase in heavy vehicle (construction vehicles) traffic will be limited to the construction period.

Waste
There will be an increase in construction waste for the duration of the construction period. Following this, waste levels will go back to what they are at present and will be limited to domestic waste.

Socio-Economic
Potential for local employment during the construction phase.

Alternative S2 (if any)

Direct impacts:

Indirect impacts:

Cumulative impacts:

No-go alternative (compulsory)

Direct impacts:

- Communities would be required to rely on a water source with a low level of assurance.

Indirect impacts:

- Decrease in hygiene levels and possible infections where water is extracted from alternative sources such as nearby streams.
- Limited ability to provide for basic human rights and needs.
- Local employment will not benefit from the project

Cumulative impacts:

- The communities involved will continue to be served at a substandard level which is not in line with Government standards.
- Decrease in hygiene levels and possible infections where water is extracted from alternative sources such as nearby streams.
- Increased costs of medical treatment associated with substandard water service provision.

Indicate mitigation measures to manage the potential impacts listed above:

Alternative S1	**Alternative S2**
Soils • Soil should be stockpiled in such a way as to minimize erosion; • Erosion berms or alternative mitigation measures must be implemented where necessary. *Vegetation and Fauna* • All construction areas should be demarcated prior to construction to ensure that the footprint of the impacts are limited (including areas where vehicles may traverse); • All alien invasive species within the construction and development footprint should be removed and follow up monitoring and removal programmes should be initiated once construction is complete; • Reseed cleared areas with an indigenous grass seed mix to prevent soil erosion; • Hunting and/or fishing activities on site is prohibited. This includes the setting of traps, or the killing of any animal caught in construction works; • No animal, reptile or bird of any sort found on site may be killed. This specifically includes snakes or other animals considered potentially dangerous discovered on site. If such an animal is discovered on site an appropriately skilled	

person should be summoned to remove the animal from the site. Consideration should be given to selection and nomination of such a person prior to site establishment. If no-one is available, training should be provided to at least two site staff members.

Waste Management and Pollution Prevention

- Demarcated areas where waste can be securely contained and stored on a temporary basis during the construction phase should be established. When adequate volumes (not more than 1 month) have accumulated all waste is to be removed from site and disposed of at a licensed facility;
- Waste is not to be buried on site;
- Storage of waste volumes must not exceed those stipulated in NEM:WA, Schedule 1;
- Hydrocarbons should be stored in a bunded storage area;
- All hazardous materials including paints, turpentine and thinners must be stored appropriately to prevent these contaminants from entering the environment;
- Prior to removal, empty drums must be stored in a bunded area to prevent spillage;
- Drizit or similar type product must be used to absorb hydrocarbon spills in the event that such spills should occur.

Surface Water

- Care must be taken to ensure that in removing vegetation adequate erosion control measures are implemented;
- The propagation of low-growing dense vegetation suitable for the habitat such as grasses or sedges is the best natural method to reduce erosion potential;
- In-stream water flow should not be hindered throughout the construction phase.

Air Quality

- Heavy vehicles and machinery should be serviced regularly to minimise exhaust fume pollution;
- Soil stockpiles will be located in areas to limit the erosive effects of the wind, and to limit dust;
- Removal of vegetation will be avoided until such time as soil stripping is required, which will limit dust.
- Vehicle speeds on unpaved roads must be

no more than 20 km/h to limit the amount of dust generated; • Haulage distances should be at a minimum; • Water should be sprayed onto gravel roads when required; • Environmentally friendly soil stabilisers may be used as additional measures to control dust on gravel roads and construction areas; • All equipment should be kept in good working order; • Equipment should be operated within its specifications and capacity and should not be overloaded; • All machinery/plant should be serviced and lubricated regularly to ensure a good working order; • Ensure that the potential noise source will conform to the South African Bureau of Standards recommended code of practice, SANS Code 0103:1983, so that it will not produce excessive or undesirable noise when it is released; • All the Contractors' equipment shall be fitted with effective exhaust silencers and shall comply with the South African Bureau of Standards recommended code of practice and the South African National Standard (SANS) Code 0103:1983, for construction plant noise generation; • All the Contractors' vehicles shall be fitted with effective exhaust silencers and shall comply with Road Traffic Act (Act 29 of 1989) when any such vehicle is operated on a public road. *Cultural and Historical* • Should any heritage resources, as defined in the National Heritage Resources Act 25 of 1999, be discovered during the course of development activities, the developer must cease all work immediately, and adhere to the protocol set out in the recommendations of this report. *Traffic* • Provide sufficient area for the storage of heavy vehicles within the construction site; • Ensure that all road diversions and closures are considered as part of the development footprint and do not add any unnecessary roads; • Ensure that vehicle traffic which may obstruct traffic flow is scheduled outside of peak travelling time; • Ensure that heavy / large load traffic is appropriately routed and appropriate	

safety precautions are taken to prohibit road collisions and traffic incidences; and • Ensure that vehicle operators are suitably licensed, have had appropriate environmental and safety induction, are aware of specific site procedures, and are well rested and cognisant when operating heavy or unsafe vehicles / machinery. *Monitoring* The contractor must appoint an on-site Environmental Liaison Officer (ELO) who will manage the day to day compliance with the EMPr. An independent Environmental Control Officer (ECO) must be appointed to conduct monthly site audits and monitoring of compliance to the EMPr.	

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):

An alternative method of achieving the project objective was considered at a conceptual level, that being a deviation from the road alignment. However because of costs, accessibility, and operational complexities, this alternative was never followed.

Alternative A1 (preferred alternative)

Soils

During the construction phase, soils will be excavated and cleared for the pipeline routes and pump stations. Potential disturbances include compaction, physical removal and potential pollution by hydrocarbons. Furthermore, if standard stormwater control measures are not implemented during the construction phase, soil erosion and subsequent removal of vegetation may occur.

Vegetation and fauna

During the construction phase vegetation will be cleared for the construction of the pipeline routes and pump stations. Wherever possible, alignments have been placed alongside existing roads and foot/cattle paths, and generally areas that have been impacted upon already for similar uses. As such it is anticipated that the vegetation removal will be limited.

Surface water

Clearing of vegetation during the construction phase will increase surface runoff and therefore adequate stormwater measures will need to be implemented. Waste generated during the construction phase may enter the environment through surface water runoff.

Air quality and Noise Pollution

Dust generation from stockpiles and soil stripping, vehicle traffic on dirt roads and motor vehicle fumes will have an impact on air quality. During the construction phase, the operation of machinery and equipment, as well as the construction vehicle traffic will increase noise levels.

Cultural and Historical

The alignment follows an existing disturbed footprint and it is unlikely that any items of archaeological significance will remain. Should any heritage resources, as defined in the National Heritage Resources Act 25 of 1999, be discovered during the course of development activities, the developer must cease all work immediately, and adhere to standard protocol.

Visual

The project involves the construction of infrastructure over an extensive area. However, due

to the fact that the pipelines will be buried, the only points of aesthetic impact will be the manholes, pump stations and route markers. The manholes and pump stations will have a limited visual impact as they are not extensive structures.

Traffic
An increase in heavy vehicle (construction vehicles) traffic will be limited to the construction period.

Socio-Economic
Construction in the area is expected to have a positive impact on the area and local community as it will provide employment opportunities during the construction phase.

Waste
The volume of waste produced will be limited to the construction phase. However if mitigation measures that are specified in the EMPr are adhered to then impacts will be minimal to non-existent. Solid waste produced must be correctly disposed of at a registered landfill site.

Indirect impacts:
Soils
Insufficient stormwater control measures may result in localised high levels of soil erosion, possibly creating dongas or gullies, which may lead to decreased environmental health and water quality.

Vegetation and Fauna
Increase in alien invasive species, therefore a possible loss in biodiversity.

Cumulative impacts:
Soils
Increased sedimentation and eutrophication within the river/stream systems may result if measures listed in the EMPr are not adhered to.

Surface Water
Surface water runoff shall stay the same. Erosion of sediment may increase because remediation measures may not be implemented.

Traffic
An increase in heavy vehicle (construction vehicles) traffic will be limited to the construction period. Traffic control measures will be implemented on site as per the EMPr.

Waste
There will be an increase in construction waste for the duration of the construction period. Following this, waste levels will go back to what they are at present and will be limited to domestic waste.

Socio-Economic
Potential for local employment during the construction and operational phases will have positive short term advantages through augmented income in families / communities.

Alternative A2

The alternative option is to deviate from the road alignment and follow a greenfields alignment. While this option may provide a minor cost savings in terms of material, this saving would be offset by the increase in time required for implementation, rehabilitation expenses associated with an increased footprint.

The risk for environmental degradation would also be increased as it would require an extended area to be disturbed.

At a preliminary stage, the use of alternative materials were also considered. These were excluded based on them either not being able to meet engineering design requirements or

costs.

Soils
During the construction phase, soils will be excavated and cleared for the pipeline routes and pump stations. Potential disturbances include compaction, physical removal and potential pollution by hydrocarbons. Furthermore, if standard stormwater control measures are not implemented during the construction phase, soil erosion and subsequent removal of vegetation may occur.

Vegetation and fauna
During the construction phase vegetation will be cleared for the construction of the pipeline routes and pump stations. Wherever possible, alignments have been placed alongside existing roads and foot/cattle paths, and generally areas that have been impacted upon already for similar uses. As such it is anticipated that the vegetation removal will be limited.

Surface water
Clearing of vegetation during the construction phase will increase surface runoff and therefore adequate stormwater measures will need to be implemented. Waste generated during the construction phase may enter the environment through surface water runoff.

Air quality and Noise Pollution
Dust generation from stockpiles and soil stripping, vehicle traffic on dirt roads and motor vehicle fumes will have an impact on air quality. During the construction phase, the operation of machinery and equipment, as well as the construction vehicle traffic will increase noise levels.

Cultural and Historical
The alignment follows an existing disturbed footprint and it is unlikely that any items of archaeological significance will remain. Should any heritage resources, as defined in the National Heritage Resources Act 25 of 1999, be discovered during the course of development activities, the developer must cease all work immediately, and adhere to standard protocol.

Visual
The project involves the construction of infrastructure over an extensive area. However, due to the fact that the pipelines will be buried, the only points of aesthetic impact will be the manholes, pump stations and route markers. The manholes and pump stations will have a limited visual impact as they are not extensive structures.

Traffic
An increase in heavy vehicle (construction vehicles) traffic will be limited to the construction period.

Socio-Economic
Construction in the area is expected to have a positive impact on the area and local community as it will provide employment opportunities during the construction phase.

Waste
The volume of waste produced will be limited to the construction phase. However if mitigation measures that are specified in the EMPr are adhered to then impacts will be minimal to non-existent. Solid waste produced must be correctly disposed of at a registered landfill site.

Indirect impacts:
Soils
Insufficient stormwater control measures may result in localised high levels of soil erosion, possibly creating dongas or gullies, which may lead to decreased environmental health and water quality.

Vegetation and Fauna
Increase in alien invasive species, therefore a possible loss in biodiversity.

Cumulative impacts:

Soils

Increased sedimentation and eutrophication within the river/stream systems may result if measures listed in the EMPr are not adhered to.

Surface Water

Surface water runoff shall stay the same. Erosion of sediment may increase because remediation measures may not be implemented.

Traffic

An increase in heavy vehicle (construction vehicles) traffic will be limited to the construction period. Traffic control measures will be implemented on site as per the EMPr.

Waste

There will be an increase in construction waste for the duration of the construction period. Following this, waste levels will go back to what they are at present and will be limited to domestic waste.

Socio-Economic

Potential for local employment during the construction and operational phases will have positive short term advantages through augmented income in families / communities.

No-go alternative (compulsory)

Direct impacts:

- Communities would be required to rely on a water source with a low level of assurance.

Indirect impacts:

- Decrease in hygiene levels and possible infections where water is extracted from alternative sources such as nearby streams.
- Limited ability to provide for basic human rights and needs.
- Local employment will not benefit from the project

Cumulative impacts:

- The communities involved will continue to be served at a substandard level which is not in line with Government standards.
- Decrease in hygiene levels and possible infections where water is extracted from alternative sources such as nearby streams.
- Increased costs of medical treatment associated with substandard water service provision.

Indicate mitigation measures to manage the potential impacts listed above:

Alternative A1:	**Alternative A2:**
Soils • Soil should be stockpiled in such a way as to minimize erosion; • Erosion berms or alternative mitigation measures must be implemented where necessary. *Vegetation and Fauna* • All construction areas should be demarcated prior to construction to ensure that the footprint of the impacts are limited (including areas where vehicles may traverse); • All alien invasive species within the	*Soils* • Soil should be stockpiled in such a way as to minimize erosion; • Erosion berms or alternative mitigation measures must be implemented where necessary. *Vegetation and Fauna* • All construction areas should be demarcated prior to construction to ensure that the footprint of the impacts are limited (including areas where vehicles may traverse); • All alien invasive species within the

construction and development footprint should be removed and follow up monitoring and removal programmes should be initiated once construction is complete; • Reseed cleared areas with an indigenous grass seed mix to prevent soil erosion; • Hunting and/or fishing activities on site is prohibited. This includes the setting of traps, or the killing of any animal caught in construction works; • No animal, reptile or bird of any sort found on site may be killed. This specifically includes snakes or other animals considered potentially dangerous discovered on site. If such an animal is discovered on site an appropriately skilled person should be summoned to remove the animal from the site. Consideration should be given to selection and nomination of such a person prior to site establishment. If no-one is available, training should be provided to at least two site staff members.	construction and development footprint should be removed and follow up monitoring and removal programmes should be initiated once construction is complete; • Reseed cleared areas with an indigenous grass seed mix to prevent soil erosion; • Hunting and/or fishing activities on site is prohibited. This includes the setting of traps, or the killing of any animal caught in construction works; • No animal, reptile or bird of any sort found on site may be killed. This specifically includes snakes or other animals considered potentially dangerous discovered on site. If such an animal is discovered on site an appropriately skilled person should be summoned to remove the animal from the site. Consideration should be given to selection and nomination of such a person prior to site establishment. If no-one is available, training should be provided to at least two site staff members.
Waste Management and Pollution Prevention • Demarcated areas where waste can be securely contained and stored on a temporary basis during the construction phase should be established. When adequate volumes (not more than 1 month) have accumulated all waste is to be removed from site and disposed of at a licensed facility; • Waste is not to be buried on site; • Storage of waste volumes must not exceed those stipulated in NEM:WA, Schedule 1; • Hydrocarbons should be stored in a bunded storage area; • All hazardous materials including paints, turpentine and thinners must be stored appropriately to prevent these contaminants from entering the environment; • Prior to removal, empty drums must be stored in a bunded area to prevent spillage; • Drizit or similar type product must be used to absorb hydrocarbon spills in the event that such spills should occur.	*Waste Management and Pollution Prevention* • Demarcated areas where waste can be securely contained and stored on a temporary basis during the construction phase should be established. When adequate volumes (not more than 1 month) have accumulated all waste is to be removed from site and disposed of at a licensed facility; • Waste is not to be buried on site; • Storage of waste volumes must not exceed those stipulated in NEM:WA, Schedule 1; • Hydrocarbons should be stored in a bunded storage area; • All hazardous materials including paints, turpentine and thinners must be stored appropriately to prevent these contaminants from entering the environment; • Prior to removal, empty drums must be stored in a bunded area to prevent spillage; • Drizit or similar type product must be used to absorb hydrocarbon spills in the event that such spills should occur.
Surface Water • Care must be taken to ensure that in removing vegetation adequate erosion control measures are implemented; • The propagation of low-growing dense	*Surface Water* • Care must be taken to ensure that in removing vegetation adequate erosion control measures are implemented; • The propagation of low-growing dense

vegetation suitable for the habitat such as grasses or sedges is the best natural method to reduce erosion potential; • In-stream water flow should not be hindered throughout the construction phase. *Air Quality* • Heavy vehicles and machinery should be serviced regularly to minimise exhaust fume pollution; • Soil stockpiles will be located in areas to limit the erosive effects of the wind, and to limit dust; • Removal of vegetation will be avoided until such time as soil stripping is required, which will limit dust. • Vehicle speeds on unpaved roads must be no more than 20 km/h to limit the amount of dust generated; • Haulage distances should be at a minimum; • Water should be sprayed onto gravel roads when required; • Environmentally friendly soil stabilisers may be used as additional measures to control dust on gravel roads and construction areas; • All equipment should be kept in good working order; • Equipment should be operated within its specifications and capacity and should not be overloaded; • All machinery/plant should be serviced and lubricated regularly to ensure a good working order; • Ensure that the potential noise source will conform to the South African Bureau of Standards recommended code of practice, SANS Code 0103:1983, so that it will not produce excessive or undesirable noise when it is released; • All the Contractors' equipment shall be fitted with effective exhaust silencers and shall comply with the South African Bureau of Standards recommended code of practice and the South African National Standard (SANS) Code 0103:1983, for construction plant noise generation; • All the Contractors' vehicles shall be fitted with effective exhaust silencers and shall comply with Road Traffic Act (Act 29 of 1989) when any such vehicle is operated on a public road. *Cultural and Historical* • Should any heritage resources, as	vegetation suitable for the habitat such as grasses or sedges is the best natural method to reduce erosion potential; • In-stream water flow should not be hindered throughout the construction phase. *Air Quality* • Heavy vehicles and machinery should be serviced regularly to minimise exhaust fume pollution; • Soil stockpiles will be located in areas to limit the erosive effects of the wind, and to limit dust; • Removal of vegetation will be avoided until such time as soil stripping is required, which will limit dust. • Vehicle speeds on unpaved roads must be no more than 20 km/h to limit the amount of dust generated; • Haulage distances should be at a minimum; • Water should be sprayed onto gravel roads when required; • Environmentally friendly soil stabilisers may be used as additional measures to control dust on gravel roads and construction areas; • All equipment should be kept in good working order; • Equipment should be operated within its specifications and capacity and should not be overloaded; • All machinery/plant should be serviced and lubricated regularly to ensure a good working order; • Ensure that the potential noise source will conform to the South African Bureau of Standards recommended code of practice, SANS Code 0103:1983, so that it will not produce excessive or undesirable noise when it is released; • All the Contractors' equipment shall be fitted with effective exhaust silencers and shall comply with the South African Bureau of Standards recommended code of practice and the South African National Standard (SANS) Code 0103:1983, for construction plant noise generation; • All the Contractors' vehicles shall be fitted with effective exhaust silencers and shall comply with Road Traffic Act (Act 29 of 1989) when any such vehicle is operated on a public road. *Cultural and Historical* • Should any heritage resources, as

defined in the National Heritage Resources Act 25 of 1999, be discovered during the course of development activities, the developer must cease all work immediately, and adhere to the protocol set out in the recommendations of this report. *Traffic* • Provide sufficient area for the storage of heavy vehicles within the construction site; • Ensure that all road diversions and closures are considered as part of the development footprint and do not add any unnecessary roads; • Ensure that vehicle traffic which may obstruct traffic flow is scheduled outside of peak travelling time; • Ensure that heavy / large load traffic is appropriately routed and appropriate safety precautions are taken to prohibit road collisions and traffic incidences; and • Ensure that vehicle operators are suitably licensed, have had appropriate environmental and safety induction, are aware of specific site procedures, and are well rested and cognisant when operating heavy or unsafe vehicles / machinery. *Monitoring* The contractor must appoint an on-site Environmental Liaison Officer (ELO) who will manage the day to day compliance with the EMPr. An independent Environmental Control Officer (ECO) must be appointed to conduct monthly site audits and monitoring of compliance to the EMPr.	defined in the National Heritage Resources Act 25 of 1999, be discovered during the course of development activities, the developer must cease all work immediately, and adhere to the protocol set out in the recommendations of this report. *Traffic* • Provide sufficient area for the storage of heavy vehicles within the construction site; • Ensure that all road diversions and closures are considered as part of the development footprint and do not add any unnecessary roads; • Ensure that vehicle traffic which may obstruct traffic flow is scheduled outside of peak travelling time; • Ensure that heavy / large load traffic is appropriately routed and appropriate safety precautions are taken to prohibit road collisions and traffic incidences; and • Ensure that vehicle operators are suitably licensed, have had appropriate environmental and safety induction, are aware of specific site procedures, and are well rested and cognisant when operating heavy or unsafe vehicles / machinery. *Monitoring* The contractor must appoint an on-site Environmental Liaison Officer (ELO) who will manage the day to day compliance with the EMPr. An independent Environmental Control Officer (ECO) must be appointed to conduct monthly site audits and monitoring of compliance to the EMPr.

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:

Soils

- The compacted surfaces caused by the construction phase have the potential for erosion if not rehabilitated.
- The exposed soil surfaces have the potential to erode easily if left uncovered which could lead to the loss of vegetation.

Vegetation and fauna

- Alien invasive encroachment.

Surface water

- Improved storm water management.
- Improved road drainage.

Socio-Economic

- Improved service delivery for the surrounding communities.
- Improved access to the surrounding communities.

Indirect impacts:

Soils

- Insufficient stormwater control measures may result in localised high levels of soil erosion, possibly creating dongas or gullies, which may lead to decreased water quality.

Vegetation and Fauna

- Increase in alien invasive species, therefore a possible loss in biodiversity.

Cumulative impacts:

Soils

- The compacted surfaces caused by the construction phase have the potential for erosion if not rehabilitated.
- The exposed soil surfaces have the potential to erode easily if left uncovered which could lead to the loss of vegetation.
- Insufficient stormwater control measures may result in localised high levels of soil erosion, possibly creating dongas or gullies, which may lead to decreased water quality.

Vegetation and fauna

- Alien invasive encroachment.
- Increase in alien invasive species, therefore a possible loss in biodiversity.

Surface water

- Improved storm water management.
- Improved road drainage.

Socio-Economic

- Improved service delivery for the surrounding communities.
- Improved access to the surrounding communities.

Alternative S2 (if any)

Direct impacts:

Indirect impacts:

Cumulative impacts:

No-go alternative (compulsory)

Direct impacts:

- Communities would be required to rely on a water source with a low level of assurance.

Indirect impacts:

- Decrease in hygiene levels and possible infections where water is extracted from alternative sources such as nearby streams.
- Limited ability to provide for basic human rights and needs.

- Local employment will not benefit from the project

Cumulative impacts:

- The communities involved will continue to be served at a substandard level which is not in line with Government standards.
- Decrease in hygiene levels and possible infections where water is extracted from alternative sources such as nearby streams.
- Increased costs of medical treatment associated with substandard water service provision.

Indicate mitigation measures to manage the potential impacts listed above:

Alternative S1	**Alternative S2**
Soils • Erosion berms or alternative mitigation measures must be implemented where necessary. *Vegetation and Fauna* • All alien invasive species within the construction and development footprint should be removed and follow up monitoring and removal programmes should be initiated once construction is complete; • Reseed cleared areas with an indigenous grass seed mix to prevent soil erosion. *Surface Water* • The propagation of low-growing dense vegetation suitable for the habitat such as grasses or sedges is the best natural method to reduce erosion potential.	

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)

Direct impacts:

Soils

- The compacted surfaces caused by the construction phase have the potential for erosion if not rehabilitated.
- The exposed soil surfaces have the potential to erode easily if left uncovered which could lead to the loss of vegetation.

Vegetation and fauna

- Alien invasive encroachment.

Surface water

- Improved storm water management.
- Improved road drainage.

Socio-Economic

- Improved service delivery for the surrounding communities.
- Improved access to the surrounding communities.

Indirect impacts:

Soils

- Insufficient stormwater control measures may result in localised high levels of soil erosion, possibly creating dongas or gullies, which may lead to decreased water quality.

Vegetation and Fauna

- Increase in alien invasive species, therefore a possible loss in biodiversity.

Cumulative impacts:

Soils

- The compacted surfaces caused by the construction phase have the potential for erosion if not rehabilitated.
- The exposed soil surfaces have the potential to erode easily if left uncovered which could lead to the loss of vegetation.
- Insufficient stormwater control measures may result in localised high levels of soil erosion, possibly creating dongas or gullies, which may lead to decreased water quality.

Vegetation and fauna

- Alien invasive encroachment.
- Increase in alien invasive species, therefore a possible loss in biodiversity.

Surface water

- Improved storm water management.
- Improved road drainage.

Socio-Economic

- Improved service delivery for the surrounding communities.

Improved access to the surrounding communities.

Alternative A2

Direct impacts:

Soils

- The compacted surfaces caused by the construction phase have the potential for erosion if not rehabilitated.
- The exposed soil surfaces have the potential to erode easily if left uncovered which could lead to the loss of vegetation.

Vegetation and fauna

- Alien invasive encroachment.

Surface water

- Improved storm water management.
- Improved road drainage.

Socio-Economic

- Improved service delivery for the surrounding communities.

- Improved access to the surrounding communities.

Indirect impacts:

Soils

- Insufficient stormwater control measures may result in localised high levels of soil erosion, possibly creating dongas or gullies, which may lead to decreased water quality.

Vegetation and Fauna

- Increase in alien invasive species, therefore a possible loss in biodiversity.

Cumulative impacts:

Soils

- The compacted surfaces caused by the construction phase have the potential for erosion if not rehabilitated.
- The exposed soil surfaces have the potential to erode easily if left uncovered which could lead to the loss of vegetation.
- Insufficient stormwater control measures may result in localised high levels of soil erosion, possibly creating dongas or gullies, which may lead to decreased water quality.

Vegetation and fauna

- Alien invasive encroachment.
- Increase in alien invasive species, therefore a possible loss in biodiversity.

Surface water

- Improved storm water management.
- Improved road drainage.

Socio-Economic

- Improved service delivery for the surrounding communities.
- Improved access to the surrounding communities.

No-go alternative (compulsory)

Direct impacts:

- Communities would be required to rely on a water source with a low level of assurance.

Indirect impacts:

- Decrease in hygiene levels and possible infections where water is extracted from alternative sources such as nearby streams.
- Limited ability to provide for basic human rights and needs.
- Local employment will not benefit from the project

Cumulative impacts:

- The communities involved will continue to be served at a substandard level which is not in line with Government standards.
- Decrease in hygiene levels and possible infections where water is extracted from alternative sources such as nearby streams.
- Increased costs of medical treatment associated with substandard water service provision.

Indicate mitigation measures to manage the potential impacts listed above:

Alternative A1	Alternative A2
Soils • Erosion berms or alternative mitigation measures must be implemented where necessary. *Vegetation and Fauna* • All alien invasive species within the construction and development footprint should be removed and follow up monitoring and removal programmes should be initiated once construction is complete; • Reseed cleared areas with an indigenous grass seed mix to prevent soil erosion. *Surface Water* The propagation of low-growing dense vegetation suitable for the habitat such as grasses or sedges is the best natural method to reduce erosion potential.	*Soils* • Erosion berms or alternative mitigation measures must be implemented where necessary. *Vegetation and Fauna* • All alien invasive species within the construction and development footprint should be removed and follow up monitoring and removal programmes should be initiated once construction is complete; • Reseed cleared areas with an indigenous grass seed mix to prevent soil erosion. *Surface Water* The propagation of low-growing dense vegetation suitable for the habitat such as grasses or sedges is the best natural method to reduce erosion potential.

2.4. IMPACTS THAT MAY RESULT FROM THE DECOMISSIONING 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:

It is unlikely that the activity will be decommissioned as it is a permanent water supply servicing specific homesteads. The concept of decommissioning the site alternative is not a viable one.

Alternative S1 (preferred alternative)

Direct impacts:

Indirect impacts:

Cumulative impacts:

Alternative S2

Direct impacts:

Indirect impacts:

Cumulative impacts:

No-go alternative (compulsory)

Direct impacts:

Indirect impacts:

Cumulative impacts:

Indicate mitigation measures to manage the potential impacts listed above:

Alternative S1	Alternative S2

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):

It is unlikely that the activity will be decommissioned as it is a permanent water supply servicing specific homesteads. The concept of decommissioning the site alternative is not a viable one.

Alternative A1 (preferred alternative)

Direct impacts: ***Indirect impacts:***   ***Cumulative impacts:***

Alternative A2

Direct impacts: ***Indirect impacts:***   ***Cumulative impacts:***

No-go alternative (compulsory)

Direct impacts: ***Indirect impacts:***   ***Cumulative impacts:***

Indicate mitigation measures to manage the potential impacts listed above:

Alternative A1	**Alternative A2**

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.

Alternative S1 (preferred site)	**Alternative S2**
An onsite Environmental Liaison Officer (ELO) must be appointed to oversee and ensure that the EMPr is correctly and stringently implemented and maintained for the duration of the construction phase of the activity. The ELO will be responsible for the day to day environmental monitoring of the construction of the road. An independent Environmental Control Officer (ECO) must be employed to conduct biweekly audits of the activity for the duration of the construction phase. The ECO will audit the compliance of the EMPr and specify any corrective measures that may be required.	

Alternative A1 (preferred alternative)	**Alternative A2**
An onsite Environmental Liaison Officer (ELO) must be appointed to oversee and ensure that the EMPr is correctly and stringently implemented and maintained for	An onsite Environmental Liaison Officer (ELO) must be appointed to oversee and ensure that the EMPr is correctly and stringently implemented and maintained for

the duration of the construction phase of the activity. The ELO will be responsible for the day to day environmental monitoring of the construction of the road. An independent Environmental Control Officer (ECO) must be employed to conduct biweekly audits of the activity for the duration of the construction phase. The ECO will audit the compliance of the EMPr and specify any corrective measures that may be required.	the duration of the construction phase of the activity. The ELO will be responsible for the day to day environmental monitoring of the construction of the road. An independent Environmental Control Officer (ECO) must be employed to conduct biweekly audits of the activity for the duration of the construction phase. The ECO will audit the compliance of the EMPr and specify any corrective measures that may be required.

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)

The proposed project should not result in impacts on the natural or social environment that are highly detrimental, or result in undue risks. The nature and types of negative impacts do not outweigh the potential benefits of this project, provided the direct impacts of the design, construction, and operational phase are mitigated. It is recommended that an independent ECO be incorporated as part of the Environmental Authorisation.

Type of Impacts

Negative impacts will be associated with the loss of natural vegetation, establishment of alien vegetation and the potential for soil erosion.

Social impacts are likely to be low negative during the construction phase, however, this is off-set by the high positive impacts during the operational phase.

Likelihood

Most of the impacts listed are likely to occur, while the project benefits will be definite during the operational phase.

Duration

The duration of most impacts will be short term during the construction phase.

Additional impacts may occur during routine maintenance and operations, however, these impacts are likely to be short-term.

The social impacts associated with the registration of the servitude will be long-term (i.e. the life of the pipeline), but similarly the provision of water will provide a long-term social benefit.

Spatial Scale

Negative impacts as noted above will be localised in scale, while the social benefits will extend

to local communities. This positive beneficial impact would therefore be regional in scale.

Intensity
Impacts on the local natural environment are likely to be moderate to low as much of the area has already been impacted by subsistence agriculture and the existing access roads.

Environmental Significance
The overall environmental impact in terms of the natural environment is moderate negative and will be limited to the construction period. The moderate impacts are associated with removal of vegetation. The adoption of the mitigation measures provided above and as detailed in the EMP should help to mitigate and reduce this impact to moderate to low negative.

The supply of potable water to an estimated 1060 households is very positive socially beneficial impact. There will be associated employment opportunities for the local community and a potential for further economic development.

Alternative S2

Alternative A1 (preferred alternative)

The proposed project should not result in impacts on the natural or social environment that are highly detrimental, or result in undue risks. The nature and types of negative impacts do not outweigh the potential benefits of this project, provided the direct impacts of the design, construction, and operational phase are mitigated. It is recommended that an independent ECO be incorporated as part of the Environmental Authorisation.

Type of Impacts
Negative impacts will be associated with the loss of natural vegetation, establishment of alien vegetation and the potential for soil erosion.

Social impacts are likely to be low negative during the construction phase, however, this is off-set by the high positive impacts during the operational phase.

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Most of the impacts listed are likely to occur, while the project benefits will be definite during the operational phase.

Duration
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The social impacts associated with the registration of the servitude will be long-term (i.e. the life of the pipeline), but similarly the provision of water will provide a long-term social benefit.

Spatial Scale
Negative impacts as noted above will be localised in scale, while the social benefits will extend to local communities. This positive beneficial impact would therefore be regional in scale.

Intensity
Impacts on the local natural environment are likely to be moderate to low as much of the area has already been impacted by subsistence agriculture and the existing access roads.

Environmental Significance
The overall environmental impact in terms of the natural environment is moderate negative and will be limited to the construction period. The moderate impacts are associated with removal of vegetation. The adoption of the mitigation measures provided above and as detailed in the EMP should help to mitigate and reduce this impact to moderate to low negative.

The supply of potable water to an estimated 1060 households is very positive socially beneficial impact. There will be associated employment opportunities for the local community and a potential for further economic development.

Alternative A2

The alternative option is to deviate from the road alignment and follow a greenfields alignment. While this option may provide a minor cost savings in terms of material, this saving would be offset by the increase in time required for implementation, rehabilitation expenses associated with an increased footprint.

The risk for environmental degradation would also be increased as it would require an extended area to be disturbed.

At a preliminary stage, the use of alternative materials were also considered. These were excluded based on them either not being able to meet engineering design requirements or costs.

The proposed project should not result in impacts on the natural or social environment that are highly detrimental, or result in undue risks. The nature and types of negative impacts do not outweigh the potential benefits of this project, provided the direct impacts of the design, construction, and operational phase are mitigated. It is recommended that an independent ECO be incorporated as part of the Environmental Authorisation.

Type of Impacts
Negative impacts will be associated with the loss of natural vegetation, establishment of alien vegetation and the potential for soil erosion.

Social impacts are likely to be low negative during the construction phase, however, this is off-set by the high positive impacts during the operational phase.

Likelihood
Most of the impacts listed are likely to occur, while the project benefits will be definite during the operational phase.

Duration
The duration of most impacts will be short term during the construction phase.

Additional impacts may occur during routine maintenance and operations, however, these impacts are likely to be short-term.

The social impacts associated with the registration of the servitude will be long-term (i.e. the life of the pipeline), but similarly the provision of water will provide a long-term social benefit.

Spatial Scale
Negative impacts as noted above will be localised in scale, while the social benefits will extend to local communities. This positive beneficial impact would therefore be regional in scale.

Intensity
Impacts on the local natural environment are likely to be moderate to low as much of the area has already been impacted by subsistence agriculture and the existing access roads.

Environmental Significance
The overall environmental impact in terms of the natural environment is moderate negative and will be limited to the construction period. The moderate impacts are associated with removal of vegetation. The adoption of the mitigation measures provided above and as detailed in the EMP should help to mitigate and reduce this impact to moderate to low negative.

The supply of potable water to an estimated 1060 households is very positive socially beneficial impact. There will be associated employment opportunities for the local community and a potential for further economic development.

No-go alternative (compulsory)

The No-go alternative will be a negative social and economic impact on the local communities. The impacts will be of long term duration and medium significance:
• There will be no basic water service supply.
• The community will continue using the river system as a source of water.
• There may be continued health risks.
• Status quo will remain, and local residents will struggle to access a nearby source of water.

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 Economic Development, Tourism & Environmental Affairs 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:

Water Pollution:

- All measures must be taken to prevent any pollution entering any of the streams or drainage features in the area.
- Stockpiles must be maintained so as to prevent top soil loss and wind-blown material entering streams or drainage features.
- Run-off prevention to be conducted through the constructing diversion berms and/or the placing straw bales on any denuded areas. Re-instatement of vegetation must take place.

- Pipeline crossing drainage lines and rivers must be to designed and installed so as not to impede the flow of water or promote erosion of river banks.
- River and stream embankments must be stabilised through re-vegetation and as instructed by the ECO.

Erosion measures :

- Should erosion become problematic, then diversion berms and drains shall be constructed to divert run-off away from exposed areas.
- Hay bales can be utilised as filters across run-off pathways.
- There should be concreted platform outfall points constructed to protect the immediate areas surrounding standpipes / taps to prevent erosion. Hygrophilous plant material should be planted at these points to assist with run-off and potential erosion issues.
- All dirty or grey water ensuing from the potable water supply must be catered for.

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

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