Northern Cape Province
DEPARTMENT OF ENVIRONMENT & NATURE CONSERVATION

Porofensi Ya Kapa Bokone
LEFAPHA LA TIKOLOGO LE TSHOMARELO YA TLHAGO

NAMAQUALAND REGIONAL WATER SUPPLY SCHEME

(REFURBISHMENT: SECOND PHASE)

(FROM HENKRIES PUMP STATION TO VAALHOEK RESERVOIR, OKIEP)

BASIC ASSESSMENT REPORT

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(REFURBISHMENT: SECOND PHASE)

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

Kindly note that:

1. This **basic assessment report** is a standard report that may be required by a competent authority in terms of the EIA Regulations, 2010 and is meant to streamline applications. Please make sure that it is the report used by the particular competent authority for the activity that is being applied for.

2. The report must be typed within the spaces provided in the form. The size of the spaces provided are not necessarily 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 typing.

3. Where applicable **tick** the boxes that are applicable or **black out** the boxes that are not applicable in the report.

4. An incomplete report may 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 may result in the rejection of the application as provided for in the regulations.

6. This report must be handed in at offices of the relevant competent authority as determined by each authority.

7. No faxed or e-mailed reports will be accepted.

8. The report must be compiled by an independent environmental assessment practitioner.

9. 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.

10. A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed.

SECTION A: ACTIVITY INFORMATION

Has a specialist been consulted to assist with the completion of this section?	YES X	NO

If YES, please complete form XX for each specialist thus appointed:
Any specialist reports must be contained in Appendix D.

1. ACTIVITY DESCRIPTION

Describe the activity, which is being applied for, in detail:

BACKGROUND

Namakwa Water was a Water Board established in terms of the Water Services Act, Act 108 of 1997. The primary purpose of Namakwa Water Board was the provision of sustainable potable water services to the towns of Steinkopf, Bulletrap, Nababeep, Okiep, Carolusberg, Concordia, Springbok and the De Beers Mining operation and settlement of Kleinzee in the Namaqualand region of the Northern Cape. The water service area is a water scarce area that is characterized by small towns spread over a vast area. The Water Service Authority (WSA) in the area is the Nama Khoi Municipality. Sedibeng Water took over the responsibilities and service area of the Namakwa Water Board on 4 April 2011.

The Namakwa water scheme was constructed during the 1970's. Water is being abstracted from the Orange River at a point near Goodhouse. The scheme exist of an extraction point on the Orange River at Henkries mond, purification works at Henkries, a booster pump station at Doringwater and round about 130 km's of pipeline to Springbok. The water is pumped from Henkries to Eenrietberg from where it gravitates to Springbok. From Springbok to Kleinzee is another 120 km's of pipeline. The raw water abstracted is delivered to the purification and treatment works at Henkries and after treatment, the potable water is distributed via pipelines to the towns as stated above. The total population in the area supplied with potable water is approximately 55 000 people.

Most of the current pipelines within this scheme have been in use well over its design period and needs to be replaced as a matter of urgency. Eventually this pipeline will have to replaced or discarded.

CURRENT INFRASTRUCTURE

The current network consists of an extracting facility at the Orange River, a primary flocculation facility at Henkriesmond, a purification plant at Henkries and 4 pumping stations. The network also consists of a number of concrete reservoirs of which the main distribution reservoirs are Eenriet near Steinkopf and Vaalhoek in Okiep. The approximately 200km of distribution pipes have an average age of 38 years. The pipeline varies in size from 520 mm steel to 150 mm asbestos pipeline.

The distribution network is operated by 31 high volume pumps, of which the capacity of some is up to 71 liters per second. These pumps have to be manually operated and monitor 24 hours continuously.

As a result age and weathering the pipeline is subject to consistent breakages, resulting in significant water losses which again results in inconsistent water supply, leaving various communities and towns without potable water on an ever increasing frequency. All of the current pipelines have been in use well over its design period and needs to be replaced as a matter of urgency. The main cause for the deterioration of the pipeline was that the mortar lining at various points detached from the inner wall which led to water seeping behind the pipeline causing rust as well as the friction caused by lose pieces of mortar within the pipeline.

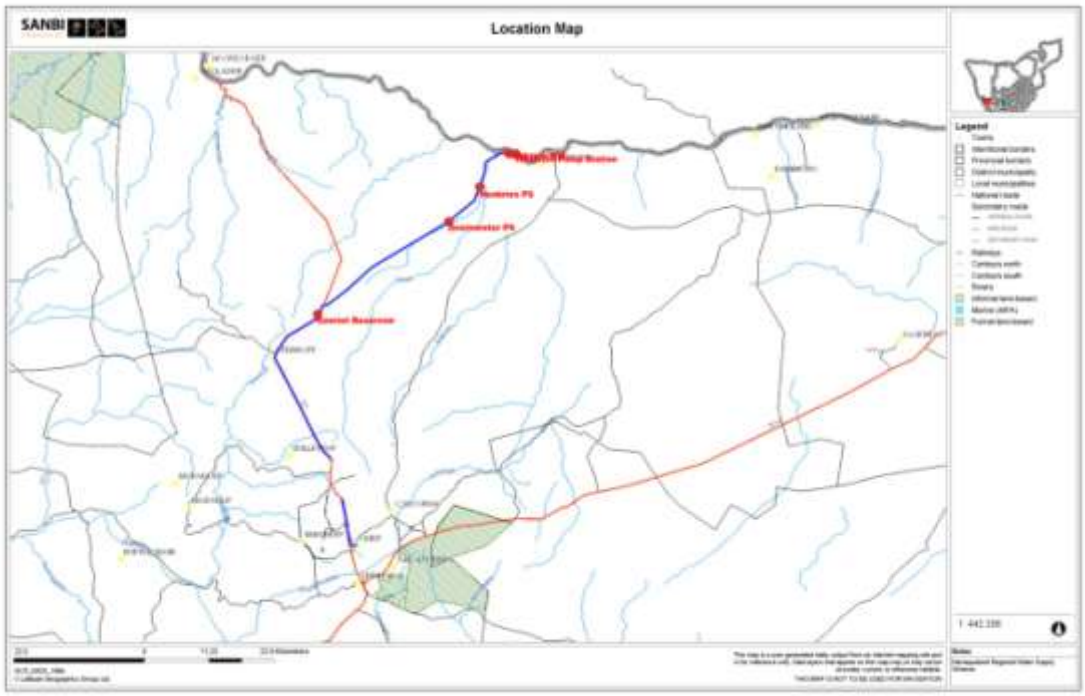
As a result the upgrading and maintenance of the Namakwa water scheme is regarded as a very high priority. Urgent infrastructure replacements and repairs should be carried out to insure continues supply. Currently supply is interrupted on a frequent basis leaving the population of 48000 without potable water. As Springbok is the main town in the region it has a hospital, prison, various old age homes and schools with hostel. This area is compounded by the interrupted supply of bulk water services.

The current pipeline was installed in 1973 and its condition deteriorated to such an extent that since 1992 and after parts of the pipeline (20km in total) has to be replaced.

PROPOSED ACTIVITY (Pipeline Refurbishment)

The proposed project comprises the second phase of this refurbishment, and entails the replacement of approximately 100 km of pipeline between Henkries extraction point to Okiep (Vaalhoek Reservoir) (Refer to Figure 1).

Figure 1: Location map for the proposed pipeline refurbishment



Please note that the replacement of a portion of this pipeline, approximately 6 km of the old pipeline, just north of Okiep (the portion between 10 km – 16 km north of Okiep) where the most frequent failures occur (at the lowest point where the pressure is at its highest) has already been approved by DENC and is known as phase 1 of the project (Refer to Environmental Authorization Ref. No. NNO 25/19 (NC/BA/NAM/NAB3/2011) issued on the 16th of February 2012).

REPLACEMENT METHOD

Since no other sources of potable water are locally available it means that the current pipelines need to be in operation while the replacement is done. A phased refurbishment has been proposed for this project. It is proposed that the existing pipeline is to be removed in sections and that the new pipeline will be placed in the same trench/location as the original pipeline (within the existing servitude). The engineers thus proposes to install the new pipeline in sections (in a leap-frog exercise) during which a temporary pipeline will be placed next to the existing pipe to ensure continual water supply (while being replaced).

2. 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 application. 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.

Paragraphs 3 – 13 below should be completed for each alternative.

PROJECT AND INTRODUCTION TO ALTERNATIVES

The proposed project comprises the second phase of this refurbishment, and entails the replacement of approximately 100 km of pipeline between Henkries extraction point to Okiep (Vaalhoek Reservoir), excluding a 6 km portion (Phase 1) already approved by DENC. Since no other sources of potable water are locally available the current pipelines need to be in operation while the replacement is done.

Four alternatives was investigated by the engineers namely:

1. Locating the new pipeline within the original trench (the preferred option) by removing the old pipeline and substituting it with the new pipeline.
2. Locating the new pipeline next to the original pipeline within the existing servitude (not removing the old pipeline).
3. Locating the new pipeline in a new servitude away from the original pipeline.
4. The "No-Go" options.

ATERNATIVE 1: SUBSTITUTING THE OLD PIPELINE WITH THE NEW, WITHIN THE SAME TRENCH

(The preferred option discussed throughout this report)

After careful consideration and various option discussions between the Client, the EAP and the Engineers the following preferred option was chosen: Locating the new pipeline within the original trench by removing the old pipeline and substituting it with the new pipeline. In order to achieve this, a phased refurbishment has been proposed for this project. It is proposed that the existing pipeline will be removed in sections and the new pipeline will be placed in the same trench/location as the original pipeline (within the existing servitude). The engineers thus proposes to install the new pipeline in sections (in a leap-frog exercise) during which a temporary pipeline will be placed next to the existing pipe to ensure continual water supply (while being replaced).

Advantages

- This option will result in the least impact on the environment (footprint will remain the same as for the original pipeline).
- It gives the opportunity to improve the state of the environment (correcting wrongs from the past) through the removal of remaining rubble and spoil left during the original installation in the 1970's and it gives the opportunity to improve the overall rehabilitation of the original pipeline route.
- Old infrastructure (pipes and concrete structures) are removed during the operation.
- Minimal (if any) additional blasting needed.

Disadvantages:

- The new pipeline will have to installed in sections (since the pipeline needs to be in operation throughout the refurbishment), which mean that temporary pipelines will have to be placed as the new pipeline is installed.

ATERNATIVE 2: LOCATING THE NEW PIPELINE NEXT TO THE ORIGINAL PIPELINE (SAME SERVITUTE)

The second alternative comprises placing the new pipeline next to the original pipeline within the same servitude. However, it was discarded early on in the discussion as a result of a fatal engineering flaw (see underneath).

Advantages

- This option will also result in the minimal additional impact on the environment (footprint will remain basically the same as for the original pipeline).
- The new pipeline can be placed as one continuous project.
- No temporary pipelines needs to be installed as the original pipeline can remain in operation while the new pipeline is placed.
- It gives the opportunity to improve the state of the environment (correcting wrongs from the past) through the removal of remaining rubble and spoil left during the original installation in the 1970's and it gives the opportunity to improve the overall rehabilitation of the original pipeline route.

Disadvantages:

- Blasting will have to done for major sections of the pipeline in order to penetrate the rocky substrate.
- Old infrastructure (pipes and concrete structures) will not be removed.

Fatal Flaw (Engineering):

- It will not be possible to do any blasting so near to the old pipeline, since it is expected (almost certain) that the old pipeline will disintegrate during the blasting operations, resulting in continual water loss, stoppages in work and repairs of the old pipeline.

ATERNATIVE 3: LOCATING THE NEW PIPELINE IN A NEW SERVITUTE AWAY FROM THE ORIGINAL

The third alternative comprises placing the new pipeline away from the original pipeline in a new servitude. This option was ultimately discarded as a result of the added environmental impact, specifically as sections of the pipeline is located within areas identified as critical biodiversity areas or ecological support areas (meaning the impact on these features will be doubled).

Advantages

- The new pipeline can be placed as one continuous project.
- No temporary pipelines needs to be installed as the original pipeline can remain in operation while the new pipeline is placed.

Disadvantages:

- This option will result in significant added environmental impact, specifically as sections of the pipeline are located within areas identified as critical biodiversity areas or ecological support areas.
- The opportunity to improve the state of the environment (correcting wrongs from the past) through the removal of remaining rubble and spoil left during the original installation in the 1970's and the opportunity to improve the overall rehabilitation of the original pipeline route will be lost.
- Blasting will have to done for major sections of the pipeline in order to penetrate the rocky substrate.
- Old infrastructure (pipes and concrete structures) will not be removed.

THE "NO-GO" ALTERNATIVE

Various studies have been under taken for alternative sources of potable water for the Nama Khoi Municipality. The latest study was conducted by the Department of Water Affairs, Kimberley, 2011 that lead to the conclusion that water from the Orange river is the only source of sufficient and sustainable quantity. This source has been utilized since 1973 when the purification works was built at Henkries for the sole purpose of the supply of potable water to the area.

However, the current pipeline has been in use well over its design period and needs to be replaced as a matter of urgency. If the pipeline is not refurbished, communities and towns in the area will suffer more cut offs from the only potable water source in the area, which could cause detrimental effects. In addition major losses in water will occur if the pipeline deterioration and leakages are not properly repaired.

It is very important to note that the "No-Go Alternative" will not result in a *status quo* or no impact. As a result the continual disturbance over time (when taking the cumulative effect into consideration) the "No-Go" alternative may have a more significant impact than some of the proposed alternatives. Each failure will result in excavations, vehicle access and possibly even temporary pipeline routes. Also note that these repairs are done out of need, with very little environmental control and very little though with regards for environmental rehabilitation, or long term improvement, and eventually the pipeline will have to be replaced.

OTHER ALTERNATIVES:

Please refer to Appendix G1 – Feasibility study for a number of other options (e.g. cartage of water, groundwater resources, desalination of see water at Kleinzee) which was also investigated.

BIODIVERSITY ASSESSMENT – APPENDIX D1

Considering the No-Go alternatives against the proposed project shows that the No-Go alternative is not viable and might even result in more disturbances over time. When taken into account that such maintenance work is mostly done without the supervision of an experienced environmental control officer, the cumulative impact over time can be even more significant.

Having evaluated and discussed the various biodiversity aspects associated with the project it is clear that the most significant impacts are associated with the impact (even temporary) on ecological sensitive areas (e.g. river system & CBA's). The fact that the underground placement proposed in this project can be seen as a short term impact and almost all significant impacts associated with the construction phase can be negated, should indicated that the proposed method of construction is viable and should be open for consideration.

With the available information to the author's disposal it is recommended that the preferred option is to be approved since it is not associated with irreversible environmental impact, provided that mitigation is adequately addresses.

ARCHEOLOGICAL ASSESSMENT – APPENDIX D2

It is the archaeologist's professional opinion that the removal and replacement of the existing water supply pipeline with a new pipeline, between Henkries and Steinkopf will not impact on any significant archaeological heritage. While some surface Later Stone Age material may be encountered along the proposed route, these are likely to be mostly dispersed and isolated occurrences.

The construction of the proposed new pipeline is not considered to pose a serious threat to the local archaeological heritage because:

- The project entails replacing an aging water pipeline with a new supply pipeline.
- The same servitude will be used.
- The servitude is only about 3 m wide.

It is therefore recommended that exemption from further specialist archaeological studies and mitigation be granted for the proposed development.

Should any unmarked human remains, or any bones, be exposed or uncovered during replacement of the old water pipeline, the archaeologist (Jonathan Kaplan 082 321 0172), or the South African Heritage Resources Agency (Katie Smuts 021 462 4502) must be immediately informed.

Burials should not be disturbed or removed until inspected by the archaeologist.

3. 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 and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

List alternative sites if applicable.

Alternative:	Latitude (S):		Longitude (E):	
Alternative S1[1] (preferred or only site alternative)	°	′	°	′
Alternative S2 (if any)	°	′	°	′
Alternative S3 (if any)	°	′	°	′

IN THE CASE OF LINEAR ACTIVITIES:

Pipeline 1: Bulletrap turn-off to Kliphoogte (+-6km)

Alternative:	**Latitude (S):**		**Longitude (E):**	
Alternative S1 (preferred or only route alternative)				
• Henkries extraction point	28°	54.114'S	18°	10.031'E
• Henkries treatment works	28°	54.060'S	18°	08.247'E
• Henkries purification plant	28°	58.556'S	18°	05.726'E
• Doornwater pump station	29°	04.908'S	17°	56.756'E
• Eenriet reservoir	29°	11.248'S	17°	48.832'E
• End northern section (Phase 1 starts)	29°	31.017'S	17°	51.567'E
• Begin southern section (Phase 1 ends)	29°	27.233'S	17°	50.383'E
• Vaalhoek Reservoir (Okiep)	29°	35.554'S	17°	53.224'E
Alternative S2 (if any)				
• ***Same as Alternative 1***	°	'S	°	'E
•	°	'S	°	'E
•	°	'S	°	'E
Alternative S3 (if any)				
• ***Scoped out before route was finalised***	°	′	°	′
•	°	′	°	′
•	°	′	°	′

For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 250 meters along the route for each alternative alignment.

4. 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)	N/a 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)	±100 000 m
Alternative A2 (if any)	±100 000 m
Alternative A3 (if any)	m

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

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

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

5. SITE ACCESS

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

Describe the type of access road planned:

N/a

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

6. 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 document.

The site or route plans must indicate the following:

6.1 the scale of the plan which must be at least a scale of 1:500;
6.2 the property boundaries and numbers of all the properties within 50 metres of the site;
6.3 the current land use as well as the land use zoning of each of the properties adjoining the site or sites;
6.4 the exact position of each element of the application as well as any other structures on the site;
6.5 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;
6.6 all trees and shrubs taller than 1.8 metres;
6.7 walls and fencing including details of the height and construction material;
6.8 servitudes indicating the purpose of the servitude;
6.9 sensitive environmental elements within 100 metres of the site or sites including (but not limited thereto):
- rivers;
- the 1:100 year flood line (where available or where it is required by DWA);
- ridges;
- cultural and historical features;
- areas with indigenous vegetation (even if it is degraded or invested with alien species);

6.9 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
6.10 the positions from where photographs of the site were taken.

7. 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 form**.** It must be supplemented with additional photographs of relevant features on the site, if applicable.

8. FACILITY ILLUSTRATION

A detailed illustration of the activity must be provided at a scale of 1:200 as Appendix C for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity.

9. ACTIVITY MOTIVATION

9(a) Socio-economic value of the activity

What is the expected capital value of the activity on completion?	**R 480 000 000**	
What is the expected yearly income that will be generated by or as a result of the activity?	**N/A**	
Will the activity contribute to service infrastructure?	**YES X**	NO
Is the activity a public amenity?	**YES X**	NO
How many new employment opportunities will be created in the development phase of the activity?	**±100**	
What is the expected value of the employment opportunities during the development phase?	**R 50 000 000**	
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?	**±10**	
What is the expected current value of the employment opportunities during the first 10 years?	**R50 000 000**	
What percentage of this will accrue to previously disadvantaged individuals?	**100%**	

9(b) Need and desirability of the activity

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

The current pipeline is already older than 35 years and has therefore deteriorated to such an extent that frequent pipeline failures occurs. Large volumes of water have also been lost due to leaks along the pipeline. This resulted in the entire population of 45 000 within the Nama Khoi Municipality been left without any potable water as this is the only source of potable water available (Refer to Appendix G1 – Feasibility study)

The overall project will entail the replacement of the entire ±200km pipeline in sections, of which this ± 100km section is the second phase of the project.

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

Namakwa Water Board is a bulk supplier of water to the Nama Khoi Municipal jurisdiction area. The communities that are served are: Steinkop, Okiep, Concordia, Nababeep, Bulletrap, Carolusberg, Springbok and Kleinzee with an estimate population of ±50 000. The replacement is essential for the continuous supply of potable water for the whole of this community.

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

The pipeline runs along an uninhabited area where the only activity is subsistence farming. The local farms extract water from wells and boreholes and watering points supply along the pipeline.

With the proposed refurbishment of the existing degraded bulk water supply pipeline the following towns will all be serviced with potable water: Steinkopf, Bulletrap, Nababeep, Okiep, Carolusberg, Concordia, Springbok and the De Beers Mining operation and settlement of Kleinzee in the Namaqualand region of the Northern Cape.

DESIRABILITY:			
1.	Does the proposed land use / development fit the surrounding area?	**YES X**	NO
2.	Does the proposed land use / development conform to the relevant structure plans, SDF and planning visions for the area?	**YES X**	NO
3.	Will the benefits of the proposed land use / development outweigh the negative impacts of it?	**YES X**	NO
4.	If the answer to any of the questions 1-3 was NO, please provide further motivation / explanation:		
5.	Will the proposed land use / development impact on the sense of place?	YES	**NO X**
6.	Will the proposed land use / development set a precedent?	YES	**NO X**
7.	Will any person's rights be affected by the proposed land use / development?	YES	**NO X**
8.	Will the proposed land use / development compromise the "urban edge"?	YES	**NO X**
9.	If the answer to any of the question 5-8 was YES, please provide further motivation / explanation.		

BENEFITS:			
1.	Will the land use / development have any benefits for society in general?	**YES X**	NO
2.	Explain:		
	The replacement is essential for the continuous supply of potable water to the surrounding community.		
	Will the land use / development have any benefits for the local communities where it will be located?		
3.	Explain:	**YES X**	NO

4.	**The pipeline runs along an uninhabited area where the only activity is subsistence farming. The local farms extract water from wells and boreholes and watering points supply along the pipeline.** **With the proposed refurbishment of the existing degraded bulk water supply pipeline the following towns will all be serviced with potable water: Steinkopf, Bulletrap, Nababeep, Okiep, Carolusberg, Concordia, Springbok and the De Beers Mining operation and settlement of Kleinzee in the Namaqualand region of the Northern Cape.**

10. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

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

Title of legislation, policy or guideline:	Administering authority:	Date:
1) Land Use Planning Ordinance (LUPO)	Local Authority	N/a
2) Heritage Approval submitted	SAHRA (Northern Cape)	Submitted
3) National Environmental Management Act (NEMA) and the Environmental Impact Assessment (EIA) Regulations 2010.	DENC	This App
4) General Authorization with regards to river crossings	Department of Water Affairs	To be submitted

11. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

11(a) Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?	**YES X**	NO
If yes, what estimated quantity will be produced per month?	m^3	

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

Very little are foreseen, for most will be reused to cover the existing pipeline once the new pipeline is located within the same trench. Spoil material left over after closing up of the trenches will be disposed of in old worked out borrow pits belonging to the local municipality. General waste and construction related waste material will be removed to the nearest legal waste disposal site.
Please note that all spoil and building rubble left during the original (1970's) construction of the pipeline will also be removed (spoil to worked out borrow pits and construction rubble to the nearest legal waste disposal site).

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

All domestic type solid waste, builders' rubble etc will be disposed of at Nama Khoi Municipality Solid Waste Disposal Site.

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

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

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 whether it is necessary to change to an application for scoping and EIA.

Can any part of the solid waste be classified as hazardous in terms of the relevant legislation?	YES	NO
If yes, inform the competent authority and request a change to an application for scoping and EIA.		
Is the activity that is being applied for a solid waste handling or treatment facility?	YES	NO

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

11(b) Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?	YES	**NO X**
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, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Will the activity produce effluent that will be treated and/or disposed of at another facility?	YES	**NO X**

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:

11(c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere?	YES	**NO X**
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 emissions in terms of type and concentration:

The project itself will not be producing any emissions, but during the construction, earth moving machinery will be employed for the duration of the construction phase which will produce diesel smoke and carbon monoxide as all internal combustion engines do.

11(d) Generation of noise

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

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:

The project itself will not be producing any noise, but during the construction, earth moving machinery will be employed for the duration of the construction phase which will produce engine noise. The activity is very remote and will therefore not impact on any people residing in the area.

12. 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 X**	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 X**

If yes, please submit the necessary application to the Department of Water Affairs and attach proof thereof to this application if it has been submitted.

13. ENERGY EFFICIENCY

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

The design for the replacement will be the same as for the original design, making use of gravity feed wherever possible. The size of the pipeline was also designed to insure optimal flow with minimal energy losses.

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

SECTION B: SITE/AREA/PROPERTY DESCRIPTION

Important notes:

1. 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): [ ]

2. Paragraphs 1 - 6 below must be completed for each alternative.

3. Has a specialist been consulted to assist with the completion of this section? | YES | NO |

If YES, please complete form XX for each specialist thus appointed:
All specialist reports must be contained in Appendix D.

1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Alternative 1:

The pipeline starts at the Henkries extraction point (elevation ± 200 m) next to the Orange River. It then follows the base of the Rocky outcrops next to the Orange River to the Henkries Treatment Works (elevation ± 208 m). From there it is follows the road to Henkries (between the rocky outcrops) and on to the Henkries Purification Plant (elevation ± 413 m). From there it follows the road connecting Henkries with the N7, through the open plains, to the Doornwater Pump station (elevation ± 745 m). From the pump station the pipeline again follows the road between Henkries and the N7 southwards, still running through the open Bushmanland plains towards the Eenriet Reservoir situated on a small koppie (elevation ± 1 094 m) next to the N7. From Eenriet it follows along the N7 (to the west) towards Steinkopf and from there all the way along the N7 towards the Vaalhoek Reservoir next to Okiep (elevation ± 956 m).

Alternative S1:

Flat X	**1:50 – 1:20 X**	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 X	**1:50 – 1:20 X**	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:
2.1 Ridgeline
2.2 Plateau
2.3 Side slope of hill/mountain X
2.4 Closed valley X
2.5 Open valley X
2.6 Plain X
2.7 Undulating plain / low hills
2.8 Dune
2.9 Seafront

The pipeline starts at the Henkries extraction point (elevation ± 200 m) next to the Orange River. It then follows the base of the Rocky outcrops next to the Orange River to the Henkries Treatment Works (elevation ± 208 m). From there it is follows the road to Henkries (between the rocky outcrops) and on to the Henkries Purification Plant (elevation ± 413 m). From there it follows the road connecting Henkries with the N7, through the open plains, to the Doornwater Pump station (elevation ± 745 m). From the pump station the pipeline again follows the road between Henkries and the N7 southwards,

still running through the open Bushmanland plains towards the Eenriet Reservoir situated on a small koppie (elevation ± 1 094 m) next to the N7. From Eenriet it follows along the N7 (to the west) towards Steinkopf and from there all the way along the N7 towards the Vaalhoek Reservoir next to Okiep (elevation ± 956 m).

3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

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

The pipeline route have to cross a number of rivers/streams found along the route.

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

Biodiversity Assessment Appendix D1

TOPOGRAPHY:

The pipeline starts at the Henkries extraction point (elevation ± 200 m) next to the Orange River. It then follows the base of the Rocky outcrops next to the Orange River to the Henkries Treatment Works (elevation ± 208 m). From there it is follows the road to Henkries (between the rocky outcrops) and on to the Henkries Purification Plant (elevation ± 413 m). From there it follows the road connecting Henkries with the N7, through the open plains, to the Doornwater Pump station (elevation ± 745 m). From the pump station the pipeline again follows the road between Henkries and the N7 southwards, still running through the open Bushmanland plains towards the Eenriet Reservoir situated on a small koppie (elevation ± 1 094 m) next to the N7. From Eenriet it follows along the N7 (to the west) towards Steinkopf and from there all the way along the N7 towards the Vaalhoek Reservoir next to Okiep (elevation ± 956 m). It crosses the N7 just before Okiep from where it follows along the eastern side of the N7. Just south of Steinkopf the pipeline crosses the first of two small rivers/streams which drains into the Doring River. The Skaap River is also crossed just north of Okiep.

SOILS:

Soils are described as soils with minimal development, usually shallow, on hard or weathering rock, with or without intermittent diverse soils. Lime generally present in part or most of the landscape. In some areas it may have restricted soil depth, excessive drainage, high erodibility, low natural fertility. May be water-intake areas, but generally with restricted land use options (refer to the Soil Map, Appendix A6).

RIVERS:

The currently pipeline location crosses the Brak-, the Doring- and the Skaap Rivers or tributaries thereof.

- Near Henkries the pipeline crosses the non-perennial Brak River (Classified as an Endangered, Class B or Largely Natural river system).
- Just south of Steinkopf the pipeline crosses two a small non-perennial tributary of the Doring River (Classified as an Endangered, Class C –Moderately Modified river system).
- The non-perennial Skaap River (and smaller tributaries thereof are also crossed in more than one location in the vicinity of Bulletrap, north of Okiep (Classified as an Endangered, Class C or Moderately Modified river system).

Although all of these rivers are regarded as slightly too moderately impacted they are still classified as endangered and in need of protection. River crossing must thus be seen as significant aspects of the proposed project.

4. GROUNDCOVER

Indicate the types of groundcover present on the site:

4.1 Natural veld – good condition [E]
4.2 Natural veld – scattered aliens [E]
4.3 Natural veld with heavy alien infestation [E]
4.4 Veld dominated by alien species [E]
4.5 Gardens
4.6 Sport field
4.7 Cultivated land
4.8 Paved surface
4.9 Building or other structure
4.10 Bare soil

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.

BIODIVERSITY ASSESSMENT APPENDIX D1

LAND USE & COVER:

Land use in the majority of the NDM is defined by livestock grazing and mining – the two major economic drivers in the region. Some agriculture in the form of wheat and grape cultivation occurs in areas under irrigation and dryland rooibos tea production occurs on the Bokkeveld Escarpment. Another significant economic factor for the NDM's economy is "flower" tourism that is based on Namaqualand's fantastic annual wildflower displays that cover regions in a kaleidoscope of colour each spring. This is a distinctly seasonal aspect of the economy, lasting only eight to ten weeks, and being highly dependent on the timing and duration of the previous winter rains. However, there are indications that in recent years the regional ecotourism industry is diversifying (e.g. 4x4 and nature tourism) with greater numbers of tourists arriving throughout the year. River rafting is also a big industry on the Orange and Doring Rivers (Namakwa District Sector Plan, 2008).

Google images of the area, confirmed by the site visit, shows that the area is still almost completely natural (apart from the N7 which bisects the study area from north to south, smaller 2-spoor tracks found in the area and the Power lines running almost parallel to the N7). No other infrastructure or land-use has been observed. Most of the study area is covered by natural vegetation with the Doring- and Skaap River and tributaries also present. No intensive agricultural practices (apart from possible

grazing) have been observed (apart from small areas in the vicinity of Henkries). The surrounding areas show the same largely natural veld extending in almost all directions (refer to the national Landcover map, Appendix A5).

VEGETATION:
In accordance with the 2006 Vegetation map of South Africa, Lesotho and Swaziland (Mucina & Rutherford, 2006) seven broad vegetation types are expected in the study area (Refer to the Vegetation map, Appendix A3), namely:

VEGETATION TYPE	BIOME	STATUS	REMAINING	FORMALLY CONSERVED	CONSERVATION TARGET
Eastern Gariep Rocky Desert (Darker blue Figure 7)	Desert	Least Threatened Not Protected	99.7%	0%	34%
Eastern Gariep Plains Desert (Lighter blue Figure 7)	Desert	Least Threatened Not Protected		0%	34%
Bushmanland Arid Grassland (Darker red Figure 7)	Nama-Karoo	Least Threatened Not Protected	99.5%	0%	21%
Bushmanland Sandy Grassland (Lighter red Figure 7)	Nama-Karoo	Least Threatened Hardly Protected	99.4%	0.4%	21%
Eenriet Plains Succulent Shrubland (Yellow Figure 7)	Succulent Karoo	Least Threatened Not Protected	99.5%	0%	28%
Namaqualand Blomveld (Darker mustard in Figure 7)	Succulent Karoo	Least Threatened Hardly Protected	94%	1.5%	28%
Namaqualand Klipkoppe Shrubland (Lighter mustard in Figure 7)	Succulent Karoo	Least Threatened Poorly Protected	95%	5.8%	28%

5. LAND USE CHARACTER OF SURROUNDING AREA

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

5.1 Natural area X
5.2 Low density residential X (e.g. Henkries)
5.3 Medium density residential X (e.g. Okiep & Steinkopf)
5.4 High density residential
5.5 Informal residential[A]
5.6 Retail commercial & warehousing
5.7 Light industrial
5.8 Medium industrial[AN]
5.9 Heavy industrial[AN]
5.10 Power station
5.11 Office/consulting room
5.12 Military or police base/station/compound
5.13 Spoil heap or slimes dam[A]
5.14 Quarry, sand or borrow pit X
5.15 Dam or reservoir X (Part of the pipeline infrastructure)
5.16 Hospital/medical centre
5.17 School
5.18 Tertiary education facility
5.19 Church
5.20 Old age home
5.21 Sewage treatment plant[A]
5.22 Train station or shunting yard[N]
5.23 Railway line[N]
5.24 Major road (4 lanes or more)[N] X (N7 lies to the east of the site)
5.25 Airport[N]
5.26 Harbour
5.27 Sport facilities
5.28 Golf course

5.29 Polo fields
5.30 Filling station [H]
5.31 Landfill or waste treatment site
5.32 Plantation
5.33 Agriculture X (e.g. Henkries)
5.34 River, stream or wetland X (Pipeline crosses the river in several places)
5.35 Nature conservation area
5.36 Mountain, koppie or ridge X
5.37 Museum
5.38 Historical building
5.39 Protected Area
5.40 Graveyard
5.41 Archaeological site
5.42 Other land uses (describe)

If any of the boxes marked with an "[N] "are ticked, how this impact will / be impacted upon by the proposed activity.

If YES, specify and explain:	**5.24 The existing pipeline runs next to the N7 for almost 60 km of its route. Special care must be taken when crossing the N7**

If any of the boxes marked with an "[An]" are ticked, how will this impact / be impacted upon by the proposed activity.

If YES, specify and explain:	N/a

If any of the boxes marked with an "[H]" are ticked, how will this impact / be impacted upon by the proposed activity.

If YES, specify and explain:	N/a

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 paleontological sites, on or close (within 20m) to the site?	**YES X**	NO
	Uncertain	
If YES, explain:	**Please refer to the Archaeological Assessment Appendix D1**	
If uncertain, conduct a specialist investigation by a recognised specialist in the field to establish whether there is such a feature(s) present on or close to the site.		
Briefly explain the findings of the specialist:	**ARCHEOLOGICAL ASSESSMENT – APPENDIX D2** It is the archaeologist's professional opinion that the removal and replacement of the existing water supply pipeline with a new pipeline, between Henkries and Steinkopf will not impact on any significant archaeological heritage. While some surface Later Stone Age material may be encountered along the proposed route, these are likely to be mostly dispersed and isolated occurrences. The construction of the proposed new pipeline is not considered to pose a serious threat to the local archaeological heritage because: • The project entails replacing an aging water pipeline with a new supply pipeline. • The same servitude will be used. • The servitude is only about 3 m wide. **It is therefore recommended that exemption from further specialist archaeological studies and mitigation be granted for the proposed development.** Should any unmarked human remains, or any bones, be exposed or uncovered during replacement of the old water pipeline, the archaeologist (Jonathan Kaplan 082 321 0172), or the South African Heritage Resources Agency (Katie Smuts 021 462 4502) must be immediately informed. Burials should not be disturbed or removed until inspected by the archaeologist.	
Will any building or structure older than 60 years be affected in any way?	YES	**NO X**
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?	YES	**NO X**

If yes, please submit or, make sure that the applicant or a specialist submits the necessary application to SAHRA or the relevant provincial heritage agency and attach proof thereof to this application if such application has been made.

SECTION C: 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 municipality which has jurisdiction in the area;
  (vi) any organ of state having jurisdiction in respect of any aspect of the activity; 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 local 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 the application has been submitted to the competent authority in terms of these Regulations, as the case may be;
  (ii) whether basic assessment or scoping procedures are being applied to the application, in the case of an application for environmental authorisation;
  (iii) the nature and location of the activity to which the application relates;
  (iv) where further information on the application or activity 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 MEASURES

The practitioner must ensure that the public participation is adequate and must determine whether a public meeting or any other additional measure is appropriate or not based on the particular nature of each case. Special attention should be given to the involvement of local community structures such as Ward Committees, ratepayers associations and traditional authorities where appropriate. Please note that public concerns that emerge at a later stage that should have been addressed may cause

the competent authority to withdraw any authorisation it may have issued if it becomes apparent that the public participation process was inadequate.

5. COMMENTS AND RESPONSE REPORT

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

6. AUTHORITY PARTICIPATION

Authorities are 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 the application at least 30 (thirty) calendar days before the submission of the application.

List of authorities informed:

Namakwa District Municipality (Mr. I Smith, Springbok)
Nama Khoi Local Municipality (The Major and Counsellors)
Department of Environmental and Nature Conservation (Me. L Karstens, Kimberley)
NC Department of Agriculture: (The Head off, Kimberley)
NC Department of Water Affairs (Mr LJ Snyders, Kimberley)
SAHRA (The Provincial Manager, Cape Town)
Department of Mineral & Energy Affairs (Mr. Enib Babuseng, Kimberley)

List of authorities from whom comments have been received:

Namakwa District Municipality – The application has been referred to Mr. I Smith and Mr. J. Loubser. Please liaise with the above officials in terms of further processes.
Nama Khoi Local Municipality (Mr. N.A. Baartman) – Support the project

7. CONSULTATION WITH OTHER STAKEHOLDERS

Note that, for linear activities, or where deviation from the public participation requirements may be appropriate, the person conducting the public participation process may deviate from the requirements of that sub regulation to the extent and in the manner as may be agreed to by the competent authority.

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 at least 30 (thirty) calendar days before the submission of the application and be provided with the opportunity to comment.

Has any comment been received from stakeholders?	**YES X**	NO

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

Nama Khoi Local Municipality (Mr. N.A. Baartman) – Support the project

PPP SUMMARY (APPENDIX E)

Public Participation was conducted for this proposed subdivision in accordance with the requirements outlined in Regulation 54 and 55 and 56 of the NEMA EIA Regulations, as well as the Guideline on Public Participation:

As such each subsection of Regulation 54 contained in Chapter 6 of the NEMA EIA Regulations will be addressed separately to thereby demonstrate that all potential Interested and Affected Parties (I&AP's) were notified of the proposed development.

R54 (2) (a) (i):
An onsite poster was displayed on the property fence at the proposed site (**Refer to Appendix E6**).
The posters contained all details as prescribed by R56 (3) (a) & (b) and the size of the onsite poster were 60cm by 42cm as prescribed by section 56 (4) (a).
R54 (2) (a) (ii): All property owners and Affected parties for all alternatives has been informed.

R54 (2) (b) (i): A mail drop containing details of the proposed development was sent to the person/s in control of the land, namely Nama Khoi Municipality. The mail drop was sent on **30th of May 2012** and informed the landowner of the proposed activity with the relevant contact details to comment or query the project on or before **21 June 2012**.
R54 (2) (b) (ii): N/a
R54 (2) (b) (iii): A mail drop containing details of the proposed development was sent to the neighbouring property owners of the site. The mail drop was done on **30th of May 2012** and informed the public of the proposed activity with the relevant contact details to comment or query the project on or before **21 June 2012**. **Refer to Appendix E3 & E4**.
R54 (2) (b) (iv): A copy of the mail drop was sent to the mayor and councillor Nama Khoi Municipality, for the wards in which the site is situated. **Refer to Appendix E3 & E4**.
R54 (2) (b) (v): A copy of the mail drop was sent to the Municipal Manager for both the Nama Khoi Municipality and the Namakwa District Municipality. **Refer to Appendix E3 & E4**.
R54 (2) (b) (vi): A copy of the mail drop was sent to the following other organs of state having jurisdiction in respect of any aspect of the activity:

- Department Environment and Nature conservation NC (Mr. Wessel Jacobs)
- Department Environment and Nature Conservation NC (Ms. Lucille Karstens)
- SAHRA NC (The Provincial Manager)
- NC Dept. Agriculture & Land Reform (The head of the Department)
- Department of Water Affairs NC (Mr. L.J. Snyders)
- Department of Minerals and Energy (Mr. Enib Babuseng)

R54 (2) (c) (i): An advertisement was displayed in the local newspaper, Die Plattelander, on **18 May 2012**. The advertisement contained the same details as the posters and the commenting period is up until **18 June 2012**.

R54 (2) (d): The activity would not have an impact that extends beyond the boundaries of the metropolitan or local municipality in which it is or will be undertaken and as such no advertisement was displayed in a provincial or national newspaper.

R54 (7) (a): All relevant facts in respect of the application were made available to potential I&AP's (Refer to Appendix E3 – E6)
R54 (7) (b): I&AP's were given more than a 21-day period to comment on the proposed application during the first round of public participation.

R55 (1) (a), (b), (c) and R56(2): A register of interested and affected parties was opened, maintained and is available to any person requesting access to the register in writing.

SECTION D: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum 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.

1) None received as yet

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 to this report):

N/a

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

List the potential direct, indirect and cumulative property/activity/design/technology/operational alternative related impacts (as appropriate) that are likely to occur as a result of the planning and design phase, construction phase, operational phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed.

ALTERNATIVE 1 (Preferred Option):

DIRECT IMPACTS: PLANNING AND DESIGN, CONSTRUCTION AND OPERATION

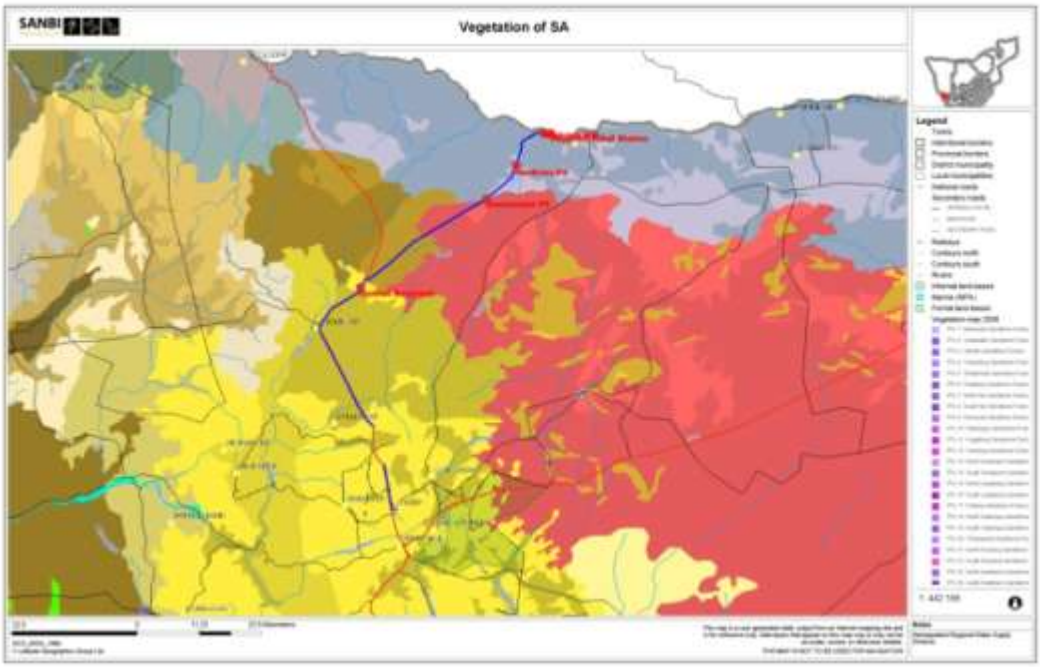
It is very important to note that the "No-Go Alternative" will not result in a *status quo* or no impact. The continual breakages over time (cumulative effect) may have a more significant impact than any of the proposed alternatives. Each failure will result in excavations, vehicle access and possibly even temporary pipeline routes. In addition, the fact remains that eventually the pipeline will have to be replaced (Biodiversity assessment, Appendix D1).

BIOPHYSICAL IMPACTS

- **Vegetation: Biodiversity assessment (Appendix D1)**

In accordance with the 2006 Vegetation map of South Africa, Lesotho and Swaziland (Mucina & Rutherford, 2006) seven broad vegetation types are expected in the study area (Refer to Figure 2).

Figure 2: Vegetation map of SA, Lesotho and Swaziland (2006)



All of these vegetation types were classified as "Least Threatened" during the National Spatial Biodiversity Assessment (NSBA), 2004, but they are also all considered to be at least "Poorly Protected" given the fact that very little of these two vegetation types are formally protected. Note that the status of these vegetation types remained "Least Threatened" as listed in the recently promulgated National list of ecosystems that are threatened and in need of protection (GN 1002, December 2011), promulgated in terms of the National Environmental Management Biodiversity Act (NEM: BA), Act 10 of 2004. In most cases, more than 95% of each vegetation type is still found in a relative natural state.

In addition the pipeline would be situated in the same area (previously disturbed) as which the original pipeline is located, which will reduce the impact significantly.

Direct impact to **vegetation would be moderate to low**, due to the fact that this area was previously disturbed in combination with the status of the vegetation itself (taken into account that some of the areas are located within identified significant biodiversity areas). Furthermore, the duration of the impact is considered to be temporary since the construction period will be relative short. With mitigation, almost all significant impacts could be negated.

Impact to **ecological processes is expected to be low to very low**, and restricted to the short construction period (open trench period). Once construction is completed and rehabilitation effected, the impact should be almost negligible.

- **Protected or red data species: Biodiversity assessment (Appendix D1)**

Aloe dichotoma var. *dichotoma* (Kokerboom) is prominently on display on the north and north-western facing mountain slopes within the study area. Quite a number of these trees has been observed in the vicinity of the proposed pipeline (must be protected during construction), especially in the Bulletrap – Okiep area.

The possibility exists that more red data species might be encountered within the study area (especially with regards to annual and geophytes plants).

However, since the impact will be very localized and associated with existing disturbed areas, the changes of irreparable or irreversible lost is considered very low.

Since excavation is needed there will be a possible **impact on loss of biodiversity and threatened species**. This will be negated to a certain extent by placing the pipeline within the original trench line and due to the relative local effect of the excavation. As such the **impact is expected to be medium to low**, but the impact could be significantly negated through good mitigation.

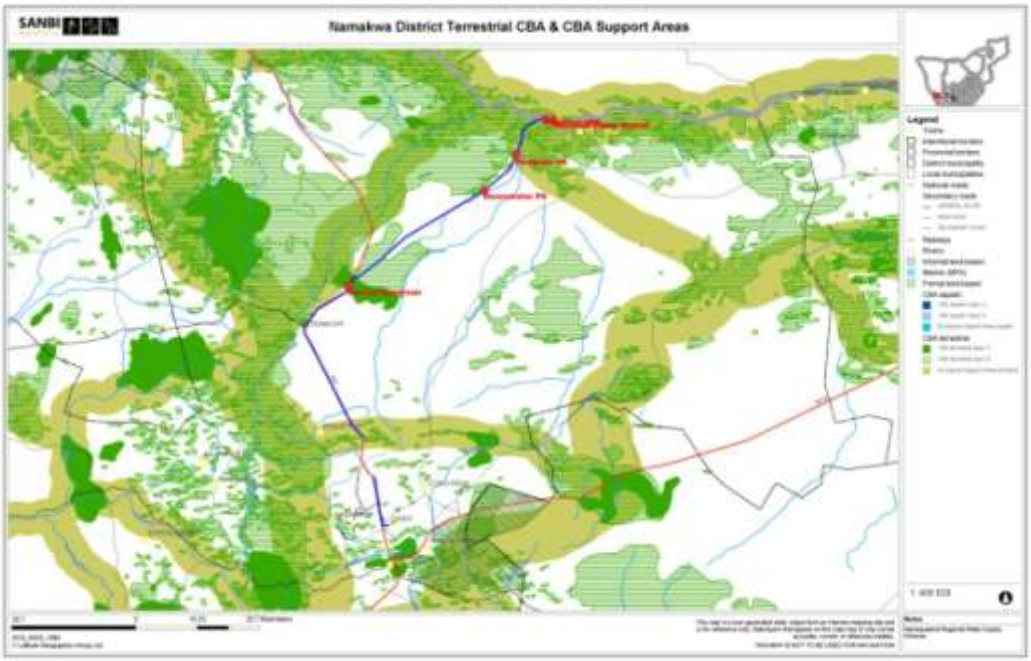
- **Critical biodiversity areas: Biodiversity assessment (Appendix D1)**

The Terrestrial Critical Biodiversity Areas (CBA) map for the Namaqualand District Municipality shows that the existing pipeline (and thus the proposed refurbishment) crosses various areas identified as CBA's or CBA support areas within the sector plan (Refer to Figure 3). It was taken into account that the original pipeline route was already disturbed during the installation of this pipeline. Secondly the disturbance (when replacing the old pipeline with the new) will be of a temporary nature. It was also presumed that Environmental Control will be applicable (in the form of an ECO) during the construction phase.

Taking the above into consideration it is evident that care will have to taken when any work is done within or near any of the identified CBA areas, especially CBA1 areas (near Eenriet Reservoir).

However, the impact could be negated and minimised through good environmental control. In fact if the old spoil (left during the original excavation) could be removed and the area cleaned up and suitably rehabilitated it might be possible **that the project could improve the status of the area as a whole, and also the CBA areas**.

Figure 3: An overview of the NDM critical biodiversity areas map for the site



Mitigation includes the following:

- Before any work is done the route must be clearly demarcated (with the aim at minimal width/smallest footprint). The demarcation must include the total footprint necessary to execute the work, but must aim at minimum disturbance.
- All significant biodiversity features must be identified and mapped on the site plans. This includes all areas falling within Ecological support areas, Critical Biodiversity Areas (CBA1 & CBA2) as well as any river crossing. Special care must be taken when working in any of these areas, which include that a suitably experienced ECO or Botanist must first walk the route in these areas to establish whether any significant features will be irreversibly impacted by the proposed activity.
- Special care must be taken when work is done within the Eenriet Plains Succulent Shrubland. In this area a suitably qualified ECO or botanist must first walk the route and identify any significant biodiversity features (such as quartz patches) along the route and then decide whether search and rescue are to be done before construction starts.
- In addition the total route must be scanned by a suitably experienced ECO or botanist in order to identify any significant plant species (e.g. protected trees or other significant Rare & Endangered species, including Geophytes where applicable). If any such features are encountered the Botanist must advise on the best way to minimise the impact (e.g. through Search & Rescue).
- Before any excavation is allowed all significant plant species identified during the botanical scan must be rescued in a search and rescue operation supervised by a suitably qualified ECO or Botanist.
- Only existing access routes may be used (if additional access is required it must be cleared with the ECO).
- All topsoil (the top 20 cm) should be removed and stored separately to be re-used during the rehabilitation after construction (the purpose being to re-use as much of the seed and bulb stock within the topsoil layer for re-establishing these species in the disturbed areas).
- The integrity of all the River system must be protected throughout the construction and operation phase of the pipeline.
- Adequate measures must be implemented to ensure against erosion.
- All alien vegetation encountered within 15 m of the route must be removed, as is legally required.
- All rubble and rubbish should be collected and removed from the site to a suitable

registered waste disposal site.

- All legal requirements must be adhered to (e.g. General Authorization from the Department of Water Affairs with regards to river crossings).
- All construction areas must be suitably rehabilitated on completion of the project. This includes the removal of all excavated material, spoil and rocks, all construction related material and all waste material. It also included replacing the topsoil back on top of the excavation as well as shaping the area to represent the original shape of the environment.

- **River systems: Biodiversity assessment (Appendix D1)**

The currently pipeline location crosses the Brak-, the Doring- and the Skaap Rivers or tributaries thereof.

- Near Henkries the pipeline crosses the non-perennial Brak River (Classified as an Endangered, Class B or Largely Natural river system).
- Just south of Steinkopf the pipeline crosses two a small non-perennial tributary of the Doring River (Classified as an Endangered, Class C –Moderately Modified river system).
- The non-perennial Skaap River (and smaller tributaries thereof are also crossed in more than one location in the vicinity of Bulletrap, north of Okiep (Classified as an Endangered, Class C or Moderately Modified river system).

Although all of these rivers are regarded as slightly too moderately impacted they are still classified as endangered and in need of protection. River crossing must thus be seen as significant aspects of the proposed project. However, with the implementation of the correct mitigation measures the river impact of the proposed development during construction will be **medium-low.**

Mitigation

- No pollution of building rubble or domestic waste during the construction phase may be allowed.
- Precautionary measures should be taken not to damage the banks of the river when constructing the pipeline across or underneath the river.
- Method statements should be prepared for each individual river crossing, which would require different measures due to different circumstances.
- The ECO onsite must inspect each method statement prior construction.
- Inspection should also take place during construction.

- ***Noise impact:***

The pipeline has no noise impact during operation. Noise impact will thus be limited to normal construction noise. The impact is likely to occur, but the extent is limited and the duration short term. Mitigation includes the intermittent nature of the construction activities, construction only taking place during normal working hours, the remote location of the pipeline and the N7 traffic noise in close proximity to sections of the pipeline route. This will result in the noise impact of the proposed development during construction to be **low.**

- ***Impact on cultural-historical aspects: (*Archaeological Assessment – Appendix D2)**

It is the archaeologist's professional opinion that the removal and replacement of the existing water supply pipeline with a new pipeline, between Henkries and Steinkopf will not impact on any significant archaeological heritage. While some surface Later Stone Age material may be encountered along the proposed route, these are likely to be mostly dispersed and isolated occurrences.

The construction of the proposed new pipeline is not considered to pose a serious threat to the local archaeological heritage because:

- The project entails replacing an aging water pipeline with a new supply pipeline.
- The same servitude will be used.
- The servitude is only about 3 m wide.

It is therefore recommended that exemption from further specialist archaeological studies and mitigation be granted for the proposed development.

Mitigation

- Should any unmarked human remains, or any bones, be exposed or uncovered during replacement of the old water pipeline, the archaeologist (Jonathan Kaplan 082 321 0172), or the South African Heritage Resources Agency (Katie Smuts 021 462 4502) must be immediately informed.
- Burials should not be disturbed or removed until inspected by the archaeologist.

- ***Visual impact:***

The proposed pipeline route will be buried. With good rehabilitation the visual impact should only be associated with the construction phase of the project.

Mitigation includes the following:

- The implementation of an Environmental Management Program (EMP) during construction and operation.
- The construction areas should be clearly demarcated and should aim for the absolute minimum disturbance footprint.
- Only existing access routes should be used where-ever possible.
- The Contractor must take appropriate and active measures to prevent erosion resulting from construction and operation, as well as storm water control measures.
- Once the pipeline has been constructed all further movement must be confined to the access tracks to allow the vegetation to re-establish over the excavated areas.

With the above described mitigation measures, the expected visual impact of the development will be of **low** significance.

INDIRECT IMPACTS:

- ***Socio-economic impacts:***

The development will have a positive impact on the socio-economics during construction and operation. During construction it will result in temporary employment opportunities. During operation the pipeline will provide potable water to numerous small towns and farmers in the Namakwa region.

The proposed socio-economic impact of the pipeline refurbishment will thus be of a **high positive significance.**

- ***Cumulative impacts:*** There is not expected to be cumulative impacts.

ALTERNATIVE 2

Impacts will be the same as for Alternative 1

However, since a fatal engineering flaw rules this option out it was not discussed any further

ALTERNATIVE 3

This alternative was scoped out very early and is thus not discussed any further

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.

Having evaluated and discussed the various biodiversity aspects associated with the proposed alternatives it is clear that only Alternatives 1 and 3 are viable options. However, alternative 3 will basically double the impact, since a new pipeline route will have to be established in virgin soils (some of which will again fall within critical biodiversity areas), while the original pipeline remains in situ. By implementing Alternative 1, the environmental impact will be the smallest, and it will have the added advantage that the poor rehabilitation and clean-up of the original installation can be addressed as part of the rehabilitation of this project. Furthermore, the old pipeline will be removed (and not left in situ, as will most probably be the case if any of the alternative options is implemented).

The major environmental impacts associated with the implementation of any of the alternatives are:

- the fact that all the proposed routes will impact on critical biodiversity areas; and
- all the routes will have an impact river systems (a number of river crossings is associated with all of these options).

For any of these options care will have to taken when any work is done within or near any of the identified CBA areas, especially CBA1 areas (near Eenriet Reservoir) and all river/ stream crossings. However, with the correct mitigation the associated impacts can be much reduced.
Alternative 1 is given as the option with the least environmental impact for the following reasons:

- The new pipeline will be installed within the original pipeline servitude (not within virgin soils).
- This area was already disturbed during the installation of the original pipeline.
- Disturbance to critical biodiversity areas and river systems will be short term impacts.
- The old pipeline will be removed (and not left in-situ).
- Poor rehabilitation and clean-up of the original installation can be addressed as part of the rehabilitation of this project.
- Very little (if any) new blasting is expected since the placement specifications for the new pipeline will be the same as for the original pipeline.

With the available information to the EAP's disposal it is recommended that **Alternative 1** be chosen as the option associated with the least environmental impact other the long-term, provided that all mitigation is adequately enforced.

No-go alternative (compulsory)

It is very important to note that the "No-Go Alternative" will not result in a *status quo* or no impact. The continual pipe breakages over time (cumulative effect), and the associated repair work (without specialized environmental supervision) may have a more significant impact than any of the proposed alternatives. Each failure will result in, water spillages, services not being provided, excavations, vehicle access and possibly even temporary pipeline routes, all of these without any expert environmental supervision. Over time these breakages will become more frequent leading to more and more man-hours in costs associated with the maintenance of the pipeline. The Nama Khoi Municipality is situated in a water scarce area, and is for the most almost totally dependent on the water supply through this pipeline. In the end the pipeline will have to be replaced.

Evaluating the No-Go alternative against the proposed alternatives shows that the No-Go alternative is **not viable** and might even result in more disturbances over time.

ENVIRONMENTAL STATEMENT

With the information available the EAP is of the consideration that if all recommendations and mitigation measures are implemented and adhered to (as described in this report and by the various Authorities); the entire impact of the proposed preferred pipeline route would be of **low-medium significance.** The medium impact is only due to the fact that the pipeline will cross critical biodiversity features as well as river systems.

It is therefore recommended that the Alternative 1 be **approved**, on condition that all recommendations and mitigation measures are implemented and adhered to as discussed within this report.

SECTION E: RECOMMENDATION OF PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner)?	**YES X**	NO
Is an EMPr attached?	**YES X**	NO

The EMPr must be attached as Appendix F.

If "NO", indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment):

If "YES", please 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:

ENVIROAFRICA RECOMMENDATIONS:

Environmental Control Officer:

- An Environmental Control Officer (ECO) to be appointed during construction to monitor compliance with the terms as set out in the EMP, and EA.

Construction:

- A Construction Environmental Management Plan (CEMP) must be implemented
- All necessary environmental controls to be discussed with the contractors on site before construction starts.
- Before any work is done the route must be clearly demarcated (with the aim at minimal width/smallest footprint). The demarcation must include the total footprint necessary to execute the work, but must aim at minimum disturbance.
- All significant biodiversity features must be identified and mapped on the site plans. This includes all areas falling within Ecological support areas, Critical Biodiversity Areas (CBA1 & CBA2) as well as any river crossing. Special care must be taken when working in any of these areas, which include that a suitably experienced ECO or Botanist must first walk the route in these areas to establish whether any significant features will be irreversibly impacted by the proposed activity.
- In addition the total route must be scanned by a suitably experienced ECO or botanist in order to identify any significant plant species (e.g. Protected trees or other significant Rare & Endangered species, including Geophytes where applicable). If any such features are encountered the Botanist must advise on the best way to minimise the impact (e.g. through Search & Rescue).
- All mandatory equipment as described in the CEMP must be in place prior to commencement of any construction.
- Method statements to be provided to ECO/Environmental consultant if any alterations, and/or deviations take place or if ECO requests one
- A physical route inspection must be conducted with the Environmental Consultant/ECO and the Contractor to establish the following:
    - Vehicle access routes (Only existing access routes may be used, if additional access is required it must be cleared with the ECO).
    - Method of pipeline trenching
    - Rehabilitation of areas where applicable (especially in regards to the trees – please refer to below botanical recommendations.
    - Storage areas for equipment must be approved by ECO and demarcated.
    - Method statements must be approved by the ECO before construction commences.

River crossings:

- The integrity of the river system must be protected throughout the construction and operation phase of the pipeline.
- No pollution of building rubble or domestic waste during the construction phase is allowed.
- Precautionary measures should be taken not to damage the banks of the river when constructing the pipeline across or underneath the river.
- Method statements should be prepared specifically for river crossings.
- The ECO must inspect each method statement prior to construction.

- Inspection should also take place during construction.
- All legal requirements must be adhered to (e.g. General Authorization from the Department of Water Affairs with regards to river crossings).

Access:

- Only existing access roads must be used as far as possible.

Solid Waste:

- All rubble and rubbish should be collected and removed from the site to a suitable registered waste disposal site.

Noise:

- Construction only taking place during normal working hours.

Management of site:

- An environmental audit to be carried out after construction is completed.

Biophysical:

- The total route must be scanned by a suitably experienced ECO or botanist in order to identify any significant plant species (e.g. Protected trees or other significant Rare & Endangered species, including Geophytes where applicable). If any such features are encountered the ECO must advise on the best way to minimise the impact (e.g. through Search & Rescue).
- Such species can be relocated to unaffected areas in the same habitat nearby or kept in cultivation for re-establishment in the disturbed areas once construction of the pipeline is completed.
- Special care must be taken when work is done within the Eenriet Plains Succulent Shrubland. In this area a suitably qualified ECO or botanist must first walk the route and identify any significant biodiversity features (such as quartz patches) along the route and then decide whether search and rescue are to be done before construction starts.
- All alien vegetation encountered within 15 m of the route must be removed.
- The Contractor must take appropriate and active measures to prevent erosion resulting from construction and operation, as well as storm water control measures.
- Prior to construction, the vegetation and topsoil along the excavation route should be removed (the top 20 cm) and stored separately from the subsoil (to be re-used during rehabilitation after construction). The topsoil and vegetation should be replaced over the disturbed soil to provide a source of seed and a seed bed to encourage re-growth of the species removed during construction. All indications show that the natural vegetation should re-establish itself on the disturbed areas, which will lessen the overall impact significantly.
- Once the pipeline has been constructed all further movement must be confined to the access tracks to allow the vegetation to re-establish over the excavated areas.
- All areas impacted by the installation of the new pipeline (as well as areas not suitably rehabilitated during the original pipeline installation) must be suitably rehabilitated to the satisfaction of the ECO.
- All remaining building rubble, building material, spoil and rocks must be removed during the rehabilitation process. "Clean" spoil can be re-used for the rehabilitation of old excavations. All building rubble and general waste must be removed to suitable waste disposal sites. Surplus building material must be removed from the site to a suitable storage area (approved by the ECO and the client).

Archaeological:

Mitigation

- Should any unmarked human remains, or any bones, be exposed or uncovered during replacement of the old water pipeline, the archaeologist (Jonathan Kaplan 082 321 0172), or the South African Heritage Resources Agency (Katie Smuts 021 462 4502) must be immediately informed.
- Burials should not be disturbed or removed until inspected by the archaeologist.

Visual:

- The implementation of an Environmental Management Program (EMP) during construction and operation.
- The construction areas should be clearly demarcated and should aim for the absolute minimum disturbance footprint.
- Only existing access routes should be used where-ever possible.
- The Contractor must take appropriate and active measures to prevent erosion resulting from construction and operation, as well as storm water control measures.
- Once the pipeline has been constructed all further movement must be confined to the access tracks to allow the vegetation to re-establish over the excavated areas.

SECTION F: APPENDIXES

The following appendixes must be attached as appropriate:

Appendix A: Locality map	**√**
A1: Regional Location Map A2: Local Location Map A3: Vegetation Map A4: Namakwa District Sector Plan (Critical biodiversity areas map) A5: Landcover Map A6: General Soil map	
Appendix B: Photographs	**√**
B1: Overview photos	
Appendix C: Facility illustrations	**√**
N/a	
Appendix D: Specialist reports	**√**
D1: Biodiversity Assessment D2: Archaeological Assessment	
Appendix E: Public Participation	**√**
E1: Acknowledgement of Application (DENC)	√
E2: Register of interested and affected parties (1st round of PPP)	√
E3: Proof of letters send to E&AP's	√
E4: Copy of hand-outs	√
E5: Proof of Advert	√
E6: Proof of Posters	√
E7: Comments received on initial PPP	√
E8: Comments and Response Report	√
Appendix F: Environmental Management Plan	
	√
Appendix G: Construction environmental management plan	**√**
G1: Sedibeng Water: Regional bulk infrastructure grant – Feasibility study	