APPLICATION FOR ENVIRONMENTAL AUTHORISATION FOR PROPOSED CONSTRUCTION OF ALFRED NZO BULKWATER SUPPLY PIPELINE PROJECT FOR WARD 29 IN MBIZANA LOCAL MUNICIPALITY– REF. NUMBER:

EC10/AN/LN1/M17-01

ALFRED NZO DISTRICT MUNICIPALITY

ALFRED NZO
DISTRICT MUNICIPALITY

BASIC ASSESSMENT REPORT

SUBMITTED TO:
PROVINCE OF EASTERN CAPE
DEPARTMENT OF ECONOMIC DEVELOPMENT, ENVIRONMENTAL AFFAIRS AND TOURISM

Province of the
EASTERN CAPE
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JUNE 2017

Project Title:	**CONSTRUCTION OF ALFRED NZO BULKWATER SUPPLY PIPELINE PROJECT FRO WARD 29 IN MBIZANA LOCAL MUNICIPALITY**
Report Title	**APPLICATION FOR ENVIRONMENTAL AUTHORISATION FOR ALFRED NZO BULKWATER SUPPLY PIPELINE PROJECT FRO WARD 29 IN MBIZANA LOCAL MUNICIPALITY:**
DETEA REFERENCE NUMBER	**EC10/AN/LN1/M17-01**
EAP Author	K Motsepe, Pr. Nat.Sci

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Draft 1	June 2017	First draft for comments by stakeholders

Consultants: Magalela & Associates

Approved for Consultants by: …….. Mr. S Mtshali, Pr. Nat. Sci. Technical Study Specialist	

DRAFT BASIC ASSESSMENT REPORT

Submitted in requirements of the Environmental Impact Assessment Regulations, December 2014 promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998)

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A. Details and Expertise of Environmental Assessment Practitioner (EAP)

PERSONAL PARTICULARS (EAP)

Name and Surname: Mr. Kgomotso Motsepe

Years of experience: 17 of working experience environmental sector and 9 years as independent water and environmental resources consultant

EDUCATION

- Management Development Programme, University of South Africa, 2006,
- Certificate in Business Management, University of South Africa , 2004,
- B Tech Chemistry, Pretoria Technikon 2003,
- N Diploma: Analytical Chemistry, Pretoria Technikon 1998

MEMBERSHIP OF PROFESSIONAL INSTITUTIONS

- South African Council for Scientific Professions – Pr.Sci.Nat.
- International Association of Impact Assessments – MIAIA.
- Water Institute of South Africa – MWISA
- Institute of Waste Management in South Africa – MIWMSA

KEY RELEVANT EXPERIENCE

- 2014, Environmental Impact Assessment for continuation of mining through wetlands for Optimum Colliery in Hendrina
- 2014, Environmental Impact Assessment for Construction of Bridges in Edenvale for Ekurhuleni Metropolitan Municipality
- 2014, Environmental Impact Assessment for construction of bulkwater pipeline in Garankua and Mabopane Township for Tshwane Metropolitan Municpality
- 2014, Application for Water Use Licence Application for Wescoal – Elandspruit Colliery Project
- 2013, Application for Water Use License Application for Optimum – Kwagga North and Tweefontein

CERTIFICATION

I, the undersigned, certify that to the best of my knowledge and belief, this data correctly describes me, my qualifications, and my experience. I hereby confirm my involvement in the proposed project.

_____ Date:_____

Kgomotso Motsepe

B. The Location Description and Locality Map of Alfred Nzo Bulkwater Pipeline Ward 29

This project involves construction of bulk water supply pipeline in ward 29, spanning the villages of Umfolozi, Bulala, Manteku, Zwelethu, Phathekile and Cwaka in Mbizana Local Municipality. The ward 29 falls within the Mbizana Local Municipality in Alfred Nzo District Municipality, the latter being the Water Services Authority. As per Alfred Nzo District Municipality's water supply development plan priority for Mbizana Local Municipality, aim to provide adequate, safe and sustainable water supply to the communities within villages in the area.

Mbizana Local Municipality is a category B municipality situated within the Alfred Ndzo District Municipality in the Eastern Cape Province. It is made up of the main town of Mbizana and surrounding villages. It covers an area of approximately 2 806 km^2. Mbizana, the political and administrative municipal seat, is located on the R61 road connecting KwaZulu Natal South Coastal boundary to the N2 leading to Mthatha. Dominant land uses within Mbizana Municipality are mostly rural with a large emphasis on subsistence agriculture in the interior and some tourism development along the coast. The natural environment in the coastal belt of the area is in an unspoiled condition and has exceptionally high conservation value. The conservation value of the inland areas is significantly lower than the coastal areas due to human activities. The municipal area is divided into 31 wards. The map showing the Ward 29 Area within Mbizana Local Municipality and Alfred Nzo District Municipality is attached herewith in **Appendix 1**.

The development of bulkwater supply pipeline scheme occurs on the following properties as tabulated in **Table 1**:

Table 1: Farm Names of Proposed Development

Farm Name	ERF	Portion
IMIZIZI	55	0
UMNYAKA	56	0
HLOLWENI	57	0

Table 2 contains the Surveyor-General 21 digit site reference numbers for the farms shown in **Table 1**.

Table 2: Surveyor-General 21 digit of Farm Portions

C	0	8	6	0	0	0	0	0	0	0	0	0	0	5	5	0	0	0	0	0
C	0	8	6	0	0	0	0	0	0	0	0	0	0	5	6	0	0	0	0	0
C	0	8	6	0	0	0	0	0	0	0	0	0	0	5	7	0	0	0	0	0

The farms are shown on map in **Appendix 2.**

The coordinates for bulkwater pipeline is shown in **Appendix 3.**

C. Layout Plan of the Bulkwater Pipeline for Ward 29

The layout plan for the proposed bulkwater pipeline for Ward 29 is shown in **Appendix 4**.

D. Description of the scope of the proposed construction of Bulkwater Pipeline for Ward 29

The bulkwater supply pipeline project will consist of:

- Bulk Gravity mains – 29.3 km, pipe diameter ranging from 32 mm – 160 mm (uPVC and HDPe pipe)
- Reticulation – 66 km, pipe diameter ranging from 32 mm – 90 mm (uPVC and HDPe pipe)
- Construction of 6 Reservoirs ranging between 80kl to 250kl
- Installation of 180 Stand pipes

The scope of work is also shown in the map attached herewith in **Appendix 4**.

The above activities triggered environmental authorization in terms of the Environmental Impact Assessment Regulations, December 2014 promulgated and amended in April 2017 in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), hence the compilation of this Basic Assessment Report. The listed activity and its description is described in **Table 4.**

Table 3: Proposed Activity Listing interms 2014 EIA Regulations

Government Notice R327 Activity No:	Describe the relevant Scoping and EIA Activity(ies) in writing as per Listing Notice 1 (GN No. R327)	Describe the portion of the development as per the project description that relates to the applicable listed activity
9	The development of infrastructure exceeding 1 000 metres in length for the bulk transportation of water 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	The bulwater supply pipeline project will consist of: • Bulk Gravity mains – 29.3 km, pipe diameter ranging from 32 mm – 160 mm (uPVC and HDPe pipe) • Reticulation – 66 km, pipe diameter ranging from 32 mm – 90 mm

Government Notice R327 Activity No:	Describe the relevant Scoping and EIA Activity(ies) in writing as per Listing Notice 1 (GN No. R327)	Describe the portion of the development as per the project description that relates to the applicable listed activity
	or more; excluding where— (a) such infrastructure is for bulk transportation of water or storm water or storm water drainage inside a road reserve or railway line reserve; or where such development will occur within an urban area.	(uPVC and HDPe pipe)
19	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse; but excluding where such infilling, depositing, dredging, excavation, removal or moving— (a) will occur behind a development setback; (b) is for maintenance purposes undertaken in	The bulwater supply pipeline project will consist of: • Bulk Gravity mains – 29.3 km, pipe diameter ranging from 32 mm – 160 mm (uPVC and HDPe pipe) • Reticulation – 66 km, pipe diameter ranging from 32 mm – 90 mm (uPVC and HDPe pipe) The pipeline will be crossing of the water course during construction and morethan 10 cubic meters of soil will be removed at the crossings.

Government Notice R327 Activity No:	Describe the relevant Scoping and EIA Activity(ies) in writing as per Listing Notice 1 (GN No. R327)	Describe the portion of the development as per the project description that relates to the applicable listed activity
	accordance with a maintenance management plan; (c) falls within the ambit of activity 21 in this Notice, in which case that activity applies; (d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.	

E. Description of the policy and legislative context within which Bulkwater Pipeline construction

The list all legislation, policies and/or guidelines of any sphere of government that are relevant to the application as contemplated in the 2014 EIA regulations, where applicable are contained in the following **Table 5:**

Table 4: List of Legislation relevant to application

Title of legislation, policy or guideline	Administering authority	Date of Promulgation
The Constitution of the Republic of South Africa	The 3 spheres of National Government	1996
The National Water Act	Department of Water and Sanitation	1998
Water Services Act	The municipalities	1997
The National Environmental Management Act	National and Provincial Environmental Affairs Department	1998
Environmental Impact Assessment Regulations	National and Provincial Environmental Affairs Department	2014
The National Health Act	Department of Health	2004
National Heritage Resources Act	Amafa and Dept. of Arts and Culture	1999
Conservation of Agricultural Resources Act	Department of Agriculture	1983
KwaZulu Land Affairs Act	Department of Local Government and Traditional Affairs	1992
Department of Transport	National Road Traffic Act	1996

In the context of the above legislations having direct or indirect impact on the development, the following state departments in **Table 6(a)** are listed as interest and affected parties. The project was also introduced to the Tribal authorities in the area **Table 6(b).** This basic assessment report has been circulated to the respective department to solicit comments and inputs in terms of the report. The records of submission are contained in **Appendix 5**. The comments or response received from the interest and affected state department will be included in the issues and response report under **Section H**

of this report. The proof written comments or report as well as response to comments will be attached in **Appendix 5**.

Table 5(a): List of State Department Stakeholders

Name of Department	Contact person	Address	Document Submitted for Comments (Yes/No)	Comments (Yes/No)
EC PTA				
ECPHRA				
Department of Water and Sanitation				
Department of Agriculture, Forestry and Fisheries				
Mbizana Local Municipality	Cllr. BA Jalubane			
Department of Transport				

Table 6(b): Triabal Authorities

Name of Department	Contact person	Address	BID submitted	Comments (Yes/No)
Department of Cooperative Governance and Traditional Affairs	Nkosi Madikizela Nobomi (0735491955)	P O Box 210485 Bizana	YES	

F. Motivation for the need and desirability for the proposed construction of Bulkwater Pipeline for Ward 29 including the need and desirability of the activity in the context of the preferred location

Water is an essential resource to the survival of human kind. The water backlog is being experienced in almost all areas within the municipality. Water Service delivery is one of the primary functions of the District Municipality (Alfred Nzo District Municipality). The estimated backlog for water service delivery is 44 479 (92%) households with no access to tap water, and 5% have access to tap water below RDP standard while 3.1% households have access to water on RDP standard and above. The water backlog is still high, however the district has invested a considerable amount towards the eradication of this backlog, to this end water schemes are still being implemented in the areas.

F.1 Provision of basic water services

This particular scheme serves the primary aim of the Alfred Nzo District Municiaplity as the Water Service Authority to deliver the basic water services to the community within its jurisdiction.

About 40% of the population still obtain water from rivers and streams and rural areas either have no sanitation or rely on pit latrines. Other existing water sources are boreholes which are not reliable, and carting of water by water tankers. Hence the communities will benefit from having safe portable water for consumption and the provision of water unlocks socio-economic development. With this proposed bulk water supply pipelines, its can transfer water quickly and effectively, avoiding evaporation which can occur in an open water transfer or diversion.

F.2 Benefits that the activity will have for society in general

The project development will bring along the following societal benefits in general:-

- The bulk water supply pipelines will ensure a sustainable supply of potable water

- Business opportunities due to increased reliability of water supply will be improved
- Improved property values of residents will be achieved as the area becomes more attractive to its citizens
- Development of area will discourage rural to urban migration of people
- An investment in the infrastructure through which levies can be collected will increase tax base for the municipality
- The construction and operationalization of this infrastructure will generate employment and improve community skills in the area
- Local businesses will benefit from the construction and operationalization of the infrastructure by supplying labour, skills, and materials required
- More investment opportunities will be realised due to the security of supply of water in the area

F.3 Benefits that the activity will have for local community in general

The project development will bring along the following local community benefits in general:-

- The proposed development will provide employment opportunities to the local community both during the construction and operational phases
- It will further contribute to the upliftment of the community through the provision of infrastructure and services in the form of bulk water services in the area
- There will be financial savings to the community by eliminating need for fetching water from long distances
- The construction and operationalisation of this infrastructure will generate employment and improve community skills in the area.
- Supply to schools will improve children's learning experiences and decrease drop-outs
- More hygiene conditions will prevail and eliminate health and environmental risks to people

G. Motivation for the preferred site, activity and technology alternative

G.1 Prefered Site alternative

There are no site alternatives as the purpose of this development is to provide water to the local community, therefore the region under consideration is the target delivery for the piped water supply and an alternate site is counter productive and uneconomical. In addition there are no significant route alternatives as the linear development will be aligned adjacent to existing road reserves for the majority of the route. It is also deemed most appropriate / reasonable to locate the pipeline next to the existing road servitudes and to utilise the degraded areas for any potential wetland crossings.

G.2 Activity alternative

The Greater Mbizana regional bulk water supply scheme comprised the new Ludeke dam, a pumped raw water supply system to the existing Nomlacu water treatment works, which was to be upgraded in two phases to 20 000 m^3/d, and a bulk treated water supply system within the Mbizana local municipality.

G.3 Technology alternative

The construction process is proposed to consist of the following fundamental activities:

- Mechanical excavation of trenches (1.2 wide and 1.6m deep) and stockpiling
- (excavations within the watercourses will be undertaken manually). The slopes of excavation will be battered / shored;
- Importing and placing of granular bedding to a depth of 300mm;
- Bulk Gravity mains – 17 km, pipe diameter ranging from 32 mm – 160 mm (uPVC and HDPe pipe).
- Reticulation – 79 km, pipe diameter ranging from 32 mm – 90 mm (uPVC and HDPe pipe)

- Construction of 5 storage reserviors ranging from 80 to 250kl as well as approximately 180 standpipes
- General backfilling and re-instatement using excavated spoil from stockpiles (temporarily stored from excavation phase);
- Hydrostatic testing of all permanent works upon completion;
- Provision of permanent and if necessary temporary cathodic protection (consists of the installation of a low voltage current to the pipeline) as required by the nominated sub-contractor; and
- De-commissioning and de-establishment of the site and contractor's camp.

G.4 The "no-go" alternative

The "no-go" alternative is for the proposed development not go ahead, the site will continue with its current activities and the provision of piped water to the local community will not be undertaken.

H. A full description of the process followed to reach the proposed preferred alternative within the site

H.1 Details of all the alternative considered

The 2008 Greater Mbizana and Flagstaff Regional Water Infrastructure Master Plan (RWIMP) proposed upgrading of the Nomlacu Water Treatment Works in conjunction with the construction of a new dam on the Ludeke River. Water will also be supplied from the existing Bizana Dam. A water resources and water demand study was undertaken on the Ludeke River prior to the 2008 RWIMP. The study indicates that the yield from the proposed Ludeke Dam is able to supply a requirement of 6.57 million m^3/a at a 98% level of assurance. This is sufficient to supply the entire strategy area with 60 l/c/d. The report proposed three primary bulk pipelines that will supply three zones as follows:

- **The South-Eastern Feeder** consists of approximately 230 km of pipeline. This pipeline will supply potable water in bulk from Nomlacu Water Treatment Works towards the south-eastern areas as far as the coast, by means of gravity. This pipeline is routed through as many villages as possible in order to (for most cases) all that will be required is an off-take to the village reservoir.
- **The North-Western Feeder** will supply areas to the north and north-west of Nomlacu Water Treatment Works. This bulk system consists of approximately 96 km of bulk pipeline. The intention is to route a pipeline through the Enkantolo area to a reservoir at elevation 1 355 m in the Lukhanisweni Village. Thereafter it will be possible to supply via gravity from this point to the remainder of the area. Off-takes to either secondary or village reservoirs will allow supply to some villages off the rising main.
- **The South-Western Feeder** will supply the south-western area. This bulk system will consist of approximately 95 km of pipelines. A pipeline will have to be laid along the R61 road towards Flagstaff. It will be necessary to pump at a point approximately 7 km along the route to a proposed bulk storage reservoir at elevation 1 130 m. It will thereafter be possible to

supply the remainder of the area under gravity.

- **Secondary bulk pipelines** will be necessary in some zones in order to link the various villages to the three proposed bulk feeder pipelines. It will be possible in many of the proposed supply zones to provide an off-take directly off the proposed bulk pipelines to village reservoirs. Reticulation to consumers will then be from these village reservoirs.

H.2 Details of the Public Participation Process (PPP) undertaken interms of regulation 41 including copies of the supporting documents and inputs

The public participation process for the construction of Alfred Nzo Bulkwater Supply Scheme for Ward 29 will entail the following:

H.2.1 Identification of stakeholders

Identification of stakeholders took place by way of contacting with local municipalities, the Tribal Authority and Induna of the communities, Ward Councillor and State Department that development of the pipeline will trigger their particiaption. The stakeholder identified are listed in **Table 6(a and b),** above.

H.2.2 Announcement of the project

A Background Information Document (BID) was prepared as a basis for discussion with stakeholders about the project. The proof of distribution of the BID during the meeting with stakeholders is attached in **Appendix 6**. The BID in the main contained the following among others:

- Background to the project (who, why, where) and the motivation thereof;
- Description of the project;
- Process that will be followed (who can participate in the process, how and when);
- Information about the independent consultants (experience of technical and public participation processes and local experience in the study area).

The copy of the BID is attached herewith in **Annexure 7.**

H.2.3 Meetings

The meetings will held separetley with different stakeholder including community meetings with respective ward committee structures. The notes or discussion points covered in the meetings will be contained in **Annexure 8**. The comments sheet will be issued with the attendees in order to record issues or

comments they could have with regards to the project development. The copy of the comments sheet is attached in **Annexure 9.**

H.2.4 Site Notice

A site notice will be displyed on the notice board of the municpality as well as public library. The public will be given 30-days to comment on the Draft Basic Assessment Report, in which they were invited to express interest if they need the copy of the report. The report will also be made available for reading at the Public Libray near Mbizana Local Municipality Head Office. The copy of the site notice and advertisement is attached in **Annexure 10.** The proof of site notice displayed on site is contained in **Annexure 11.**

H.2.5 Newspaper Advertisement

The project was advertised in Uvo Lwethu Express Newspaper. The public was given 30-days to comment on the Draft Basic Assessment Report, in which they were invited to express interest if they need the copy of the report. The report was also made available for comments at the Public Libraries in Mbizana Public Library in Bizana Town. The copy of the advertisement in the Uvo Lwethu Express Newspaper is attached in **Annexure 12.**

H.3 Summary of Isssues raised by Interested and Affected Parties (I&AP's)

The summary of isssues raised during the public participation process will be captured here:-

The Issues and Response Report is contained in **Annexure 13.**

H.4 Environmental Attributes associated with Alternatives focusing on the Geographical, Physiscal, Biological, Social, Economic, Heritage and Cultural Aspects

Ward 29 is one of the towns of the Mbiza Local Municiaplity sitiuated in the rural area of the municipality. The District Municipality is Alfred Nzo District Municipality. The map showing Ward 29 within Mbizana Local Municipality in relation to Alfred Nzo Distrct Municipality is shown in **Appendix 14.**

The environtal attribute associated with the constrution of the bulkwater pipe line is demonstrated and summarised in the **Table 7** below:-

Table 6: Environmental Attributes associated with construction of bulkwater pipeline

Environmental Attribute	Description
Gradient of the site	1.5 -1.2 m
Location in Landscape	Undulating plain/low hills
Groundwater	Water table below 1.5m deep
Soil	Often Dry hard soil in the area
Geological Stability	The geology is rocky but stable
Groundcover	Natural veld with heavy alien infestation
Land use character of surrounding area	The area is charecterised by vacant land, followed by rural community settlement. The pipeline crosses streams along distribution network
Cultural and Historical Features	There are no cultural/historical features affected by the pipeline
Social and Economic aspect	The project will create employment opportunities during construction and operation phase

H.5 The methodology used in determining and ranking the nature/severity, significance, consequence, extent, duration and probability of potential environmental impacts and risk associated with alternatives

The risk assessment methodology was used for the ranking of the impacts. The severity/intensity of the potential environmental impacts were evaluated according to their severity (how bad the impact is), duration (how long the environment will take to recover from the impact), extent (the area that is effected by the impact), probability (the probability of the impact actually happening), frequency of occurrence (how often the aspect happens) and finally the environmental significance of the impact. All the above was rated on a scale of 5 with 1 being the least impacted.

This system derives environmental significance on the basis of the consequence of the impact on the environment and the likelihood of the impact occurring. Consequence is calculated as the average of the sum of the ratings of severity, duration and extent of the environmental impact. Likelihood considers the frequency of the activity together with the probability of an environmental impact occurring. The following tables **(Table 8 to Table 15)** describe the process in detail:

A. CONSEQUENCE

Consequence **(Table 8)** is calculated as the average of the sum of the ratings of severity **(Table 9)**, duration **(Table 10)** and extent **(Table 11)** of the environmental impact.

Table 7: Determination of Consequence

Determination of Consequence (C)	(Severity + Duration + Extent) / 3

H.5.1 Severity

This is an appraisal of the type of effect the activity would have on the affected environment. This description including what is being affected and how is shown in **Table 9.**

Table 8: Severity Estimation

Rating	Description
1	Negliable / non-harmful / minimal deterioration (0 – 20%)

2	Minor / potentially harmful / measurable deterioration (20 – 40%)
3	Moderate / harmful / moderate deterioration (40 – 60%)
4	Significant / very harmful / substantial deterioration (60 – 80%)
5	Irreversible / permanent / death (80 – 100%)

H.5.2 Extent

This indicates the spatial area that may be affected by the impact and further describes the possibility that adjoining areas may be impacted upon. This includes four classes that are listed as follows in **Table 10:**

Table 9: Extent of Activity Estimation

Rating	Description
1	Within immediate area of activity
2	Surrounding area within project boundary
3	Beyond project boundary
4	Regional / provincial
5	National / international

H.5.3 Duration

This refers to the period of time that the impact may be operative for (i.e. the lifetime of the impact). This includes the following classes that are listed as follows **Table 11**:

Table 10: Duration of the Impact

Rating	Description
1	Less than 1 month / quickly reversible
2	Less than 1 year / quickly reversible
3	More than 1 year / reversible over time
4	More than 10 years / reversible over time / life of project or facility
5	Beyond life of project of facility / permanent

B. LIKELiHOOD

Likelihood **(Table 12)** considers the frequency of the activity together with the probability of the environmental impact associated with that activity occurring.

Table 11: Determination of Likelihood

Determination of Likelihood (L) =	(Frequency + Probability) / 2

H.5.4 Probability

This refers to the probability of the impact actually occurring. The following classes in **Table 13** are used to describe the probability of the impact:

Table 12: Probability of Impact

Rating	Description
1	Almost impossible
2	Unlikely
3	Probable
4	Highly likely
5	Definite

H.5.5 Frequency

This refers to the frequency of the impact actually occurring. The following classes of rating in **Table 14** are used to describe the frequency of the impact occurring:

Table 13: Frequency of the Impact

Rating	Description
1	Less than once a year
2	Once in a year
3	Quarterly
4	Weekly
5	Daily

H.5.6 Environmental Significance

The significance of the impact (i.e. whether it will lead to a marked change in the environment or not) is determined through a synthesis of the aspects produced in terms of their severity, exent, duration, probability and frequency. Therefore, Environmental significance is the product of the consequence and likelihood values. Four classes of environmental significance are tabulated in **Table 15** as follows:

- None (the impact will not have an influence on the decision and requires no mitigation)
- Low (the impact will have a limited influence on the decision and requires mitigation to manage the environment)

- Medium (it is likely that to have an influence on the decision and requires mitigation)
- High (mitigation is required and this may not be sufficient to ensure that the environment is not detrimentally affected by the proposed development

Table 14: Environmental Significance of Impact

Environmental Significance (Impact) = C × L	Description
N (1 – 4.9)	None environmental significance
L (5 – 9.9)	Low environmental significance
M (10 – 14.99)	Medium environmental significance
H (15 – 25)	High environmental significance. Likely to be a fatal flaw.

H.6 Impacts and Risk identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these aspects can be reversed, may cause irreplaceable loss of resources and can be avoided, managed or mitigated

Table 16 to **Table 19** shows the environmental significance of impacts and risk identified for the identified alternative (preferred option) both pre-mitigation measures and post-mtigation measures. The environmental significance rating of each aspects pre and post mitigation measures is contained in **Appendix 15.**

Table 15: Environmental Significance of Impacts during Design and Planning Phase

DESIGN AND PLANNING PHASE

Potential impacts:	Significance rating of impacts:	Proposed mitigation:	Significance rating of impacts after mitigation:
Loss of vegetation	**None**	▪ Minimize vegetation destruction to minimum area of Test pit excations along the sampling points for geotechnical assessment.	**None**
Soil Erosion	**None**	▪ Top soil removed during Test pit excations along the sampling points for geotechnical assessment must be backfilled and leveled to prior natural conditions	**None**
Water pollution	**None**	▪ Test pit excavation to be conducted outside 100m of the banks of water courses	**None**
Dust generation	**None**	▪ TLB's to only be driven in area that is identified for sampling	**None**
Hazardous Substance contamination	**None**	▪ The TLB's must be provided with drip trays when not in use	**None**
Noise generation	**None**	▪ Avoid excessive revving and ignition of equipment.	**None**
Waste pollution	**None**	▪ Dispose waste at registered waste disposal facility	**None**
Fire ignition	**None**	▪ TLB's to always have fire extinguishers and have employees trained on their use	**None**
Loss of fauna and Flora	**None**	▪ Test pit excavation to be conducted outside 100m of the banks of water courses ▪ Minimize vegetation destruction to minimum area of Test pit excations along the sampling points for	**None**

DESIGN AND PLANNING PHASE

Potential impacts:	Significance rating of impacts:	Proposed mitigation:	Significance rating of impacts after mitigation:
		geotechnical assessment.	
Damage to existing infrastructure e.g. sewage lines	**None**	▪ Infrastructure mapping and confirmation.	
Injury to public and animals due to falling into workings	**None**	▪ Prevent unauthorized entry to the working area	**None**
Traffic congestion	**None**	▪ Avoid traffic jamming e.g. move machinery and plant outside of rush hour ▪ Plan work area to minimize traffic obstruction	**None**
Traffic incidents	**None**	▪ Install illuminating warning lights, traffic calming structures, etc. ▪ Use flagman to slow and direct traffic	**None**
Pedestrian injuries and route closures	**None**	▪ Redirect pedestrians away from working areas ▪ Use barricades and signage ▪ Prevent unauthorized access to working areas	**None**
Stormwater Management	**None**	▪ The contractor will be advised to implement proper storm management plan	**None**
Cultural Heritage Resources	**None**	▪ If any cultural and heritage resources can be discovered on the proposed site the construction will be halted and the case to be reported to SAPS.	**None**

Table 16: Environmental Significance of Impacts during the Construction Phase

CONSTRUCTION PHASE

Potential impacts:	Significance rating of impacts:	Proposed mitigation:	Significance rating of impacts after mitigation:
Loss of vegetation	**Medium**	▪ Minimize vegetation destruction to minimum area where construction operations are. ▪ Topsoil removed must be used to level the area, in order to allow the seeds to regerminate	**None**
Soil Erosion	**Medium**	▪ Minimize vegetation destruction to minimum area where construction operations are. ▪ Divert stormwater away from the disturbed areas and loose soils ▪ Compact well after pipe laying ▪ Cover soil heaps to prevent erosion ▪ Topsoil removed must be used to level the area, in order to allow the seeds to regerminate	**None**
Water pollution	**Medium**	▪ Avoid soil erosion (see above) ▪ Avoid loss of vegetation (see above) ▪ Avoid refueling onsite ▪ Diverted stormwater must be returned to the water course without contamination ▪ Conditions setout by the Department of Sanitation for water quality must be adhered to.	**None**
Dust generation	**Low**	▪ Limit loss of vegetation (see above) ▪ Avoid over movement of plant on site ▪ Limit speed to 20km/hr. or less in the construction site ▪ Apply dust suppression regularly and as required	**None**

CONSTRUCTION PHASE

Potential impacts:	Significance rating of impacts:	Proposed mitigation:	Significance rating of impacts after mitigation:
		▪ Cover soil heaps	
Hazardous Substance contamination	**Medium**	▪ Avoid refueling onsite ▪ Refueling to occur at designated areas and with drip trays installed ▪ Training of substance handlers for correct handling	**None**
Noise generation	**Low**	▪ Proper plant, machinery and motor maintenance ▪ Use noise reduction apparatus where applicable ▪ Avoid excessive revving and ignition of equipment. ▪ Operational hours between 07h00 and 17h00	**None**
Waste pollution	**Medium**	▪ Use dedicated waste bins ▪ Practice waste separation (General and Hazardous) ▪ Dispose waste at registered waste disposal facility	**None**
Fire ignition	**Low**	▪ Avoid lighting fires on site ▪ Ban smoking near flammable substances ▪ Ensure correct handling of flammable substances ▪ Have fire extinguishers and have employees trained on their use	**None**
Loss of fauna and Flora	**Low**	▪ Avoid vegetation loss (see above) ▪ Avoid fires (see above) ▪ Avoid hazardous substance contamination of soil and water (see above) ▪ Prevent collection/capture of fauna by employees	**None**
Damage to existing infrastructure e.g. sewage lines	**Low**	▪ Infrastructure mapping and confirmation. ▪ Servitude applications ▪ Contingency and emergency measures	

CONSTRUCTION PHASE

Potential impacts:	Significance rating of impacts:	Proposed mitigation:	Significance rating of impacts after mitigation:
Injury to public and animals due to falling into workings	**Low**	▪ Prevent unauthorized entry to the working area ▪ Barricade all works with barricade fence ▪ NO ENTRY and DANGER signs erected and maintained ▪ Smallest lead times between trenching and pipe burying. ▪ Close dig-up areas as soon as pipes have been laid.	**None**
Traffic congestion	**Medium**	▪ Avoid traffic jamming e.g. move machinery and plant outside of rush hour ▪ Move plant and machinery away from high traffic areas ▪ Plan work area to minimize traffic obstruction	**None**
Traffic incidents	**Medium**	▪ Avoid traffic congestion (see above) ▪ Implement traffic safety measures ▪ Install illuminating warning lights, traffic calming structures, etc. ▪ Use flagman to slow and direct traffic	**None**
Pedestrian injuries and route closures	**Medium**	▪ Redirect pedestrians away from working areas ▪ Use barricades and signage ▪ Prevent unauthorized access to working areas	**None**
Stormwater Management	**Low**	▪ The contractor will be advised to implement proper storm management plan	**None**
Cultural Heritage Resources	**Low**	▪ If any cultural and heritage resources can be discovered on the proposed site the construction will have to be halted and the case be reported to SAPS.	**None**

Table 17: Environmental Significance of Impacts during Decommisioning Phase

DECOMMISIONING PHASE

Potential impacts:	Significance rating of impacts:	Proposed rehabilitation measures	Significance rating of impacts after rehabilitation measures
Loss of vegetation	**Medium**	▪ Topsoil removed must be used to level the area, in order to allow the seeds to regerminate ▪ Indigenous vegetation (if any) will need to be relocated and planted again	**None**
Soil Erosion	**Low**	▪ Rows of straw, hay or bundles of cut vegetation may also be used. In this instance, the hay, straw or vegetation is dug into the soil in contours, in order to help slow surface wash and capture eroded soil. ▪ The spacing between rows would be dependant on slope and the specific area.	**None**
Water pollution	**Low**	▪ Waste Materials collected on site after decommisiong the site must not be diverted into nearby water courses	**None**
Dust generation	**Medium**	▪ Avoid over movement of plant on site ▪ Limit speed to 20km/hr. or less in the construction site	**None**
Hazardous Substance contamination	**Medium**	▪ Refueling to occur at designated areas and with drip trays installed ▪ All waste material generated on site must be disposed off at registererd hazardous landfill site. ▪ Proof of disposal must be made available to Site Engineer	**None**
Noise generation	**Low**	▪ Avoid excessive revving and ignition of equipment. ▪ Operational hours between 07h00 and 17h00	**None**

DECOMMISIONING PHASE

Potential impacts:	Significance rating of impacts:	Proposed rehabilitation measures	Significance rating of impacts after rehabilitation measures
Waste pollution	**Medium**	▪ Use dedicated waste bins ▪ Practice waste separation (General and Hazardous) ▪ Dispose waste at registered waste disposal facility	**None**
Fire ignition	**Low**	▪ Avoid lighting fires on site ▪ Ban smoking near flammable substances ▪ Ensure correct handling of flammable substances ▪ Have fire extinguishers and have employees trained on their use	**None**
Loss of fauna and Flora	**Low**	▪ Rehabilitate the area workings within the water course to allow natural flows ▪ Remove structures that can impede natural flow in the water ▪ Use Gabion baskets and Rhino mattress to stabilize river banks	**None**
Damage to existing infrastructure e.g. sewage lines	**Low**	▪ Infrastructure mapping and confirmation. ▪ Servitude applications ▪ Contingency and emergency measures	**None**
Injury to public and animals due to falling into workings	**Low**	▪ Prevent unauthorized entry to the working area ▪ Barricade all works with barricade fence ▪ NO ENTRY and DANGER signs erected and maintained ▪ Smallest lead times between trenching and pipe burying. ▪ Close dig-up areas as soon as pipes have been laid.	**None**

DECOMMISIONING PHASE

Potential impacts:	Significance rating of impacts:	Proposed rehabilitation measures	Significance rating of impacts after rehabilitation measures
Traffic congestion	**Medium**	▪ Avoid traffic jamming e.g. move machinery and plant outside of rush hour ▪ Move plant and machinery away from high traffic areas ▪ Plan work area to minimize traffic obstruction	**None**
Traffic incidents	**Medium**	▪ Avoid traffic congestion (see above) ▪ Implement traffic safety measures ▪ Install illuminating warning lights, traffic calming structures, etc. ▪ Use flagman to slow and direct traffic	**None**
Pedestrian injuries and route closures	**Medium**	▪ Redirect pedestrians away from working areas ▪ Use barricades and signage ▪ Prevent unauthorized access to working areas	**None**
Stormwater Management	**Low**	▪ The design of drainage and stormwater pipes should be to reduce flow velocity and avoid soil erosion. This can be achieved through the construction of water velocity dissipators below the pipe head wall. ▪ Rocks, boulders or concrete blocks may be utilised for these purposes, and they are set into the concrete pron below the headwall. Stone pitching may also be utilised.	**None**

Table 18: Environmental Significance of Impacts during Operational Phase

OPERATION PHASE

Potential impacts:	Significance rating of impacts:	Proposed mitigation measures	Significance rating of impacts after rehabilitation measures
Soil Erosion	**Low**	▪ Implement the appropriate topsoil and stormwater runoff control management measures to prevent the loss of topsoil. ▪ The site should be graded well to permit drainage and to prevent ponding	**None**
Water pollution	**Low**	▪ A comprehensive water pressure management must be adhered to prevent pressure build ups resulting in pipe burst ▪ A use pressure reducing valves must be implemented	**None**
Loss of fauna and Flora	**Low**	▪ Trees and shrubs conserved shall be clearly introduced to the site under the supervision of the Project Enginner. ▪ This trees cannot be planted directly on the pipeline, but appropriate planting site must be negotiated well with all interest and affected parties ▪ Pipeline crossing over the stream must always be freed of debris building up	**None**
Damage to existing infrastructure e.g. sewage lines	**Low**	▪ Infrastructure mapping and confirmation. ▪ Servitude applications ▪ Contingency and emergency measures	**None**

OPERATION PHASE

Potential impacts:	Significance rating of impacts:	Proposed mitigation measures	Significance rating of impacts after rehabilitation measures
Traffic incidents	**Medium**	▪ A comprehensive water pressure management must be adhered to prevent pressure build ups resulting in pipe burst ▪ A use pressure reducing valves must be implemented ▪ Implement traffic safety measures in case of pipe burst ▪ Install illuminating warning lights, traffic calming structures, etc. should flooding be the resultant impact ▪ Use flagman to slow and direct traffic	**None**
Pedestrian injuries and route closures	**Medium**	▪ Redirect pedestrians away from pipe burst areas ▪ Use barricades and signage ▪ Prevent unauthorized access to working areas	**None**
Stormwater Management	**Low**	▪ Ensure effective storm water management will be exercised to limit negative impacts on the environment and enhance the positive impacts ▪ All contaminated standing water should be immediately removed and treated or disposed of appropriately. ▪ Surfaces and conduits should be constructed to drain the run off more efficiently	**None**

H.7 Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects

Table 20 shows the positive and negative impacts the proposed activity will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.

Table 19: Positive and Negative Impacts on the Environmental Attributes

Environmental Attributes	Description	Design and Planning (Positive / Negative Impact	During Construction – (Positive / Negative Impact)	Post Construction (Positive / Negative Impact)
Gradient of the site	1.5 -1.2 m	**Positive** , no change to the gradient of the site	**Positive**, as the pipeline will follow the slope of the area.	**Positive**, as the pipeline will follow the slope of the area.
Location in Landscape	Undulating plain/low hills	**Positive,** there will be no change in Landscape	**Positive**, as the pipeline will be following the land scape	**Positive**, as the pipeline will be following the land scape
Groundwater	Water table below 1.5m deep	**Positive,** test pit excavations will not intersect the groundwater table	**Positive**, the pipeline excavations will not intersect the groundwater table.	**Positive**, the pipeline excavations will not intersect the groundwater table.
Soil	Often Dry hard soil in the area	**Positive,** test pit excavations will only be limited to the sample points	**Positive,** the ground will only be excavated limited along the surveyed pipeline route	**Negative,** the excavated portion of the pipeline will be soft and dry during backfilling process and will take longer to harden to pre-soil

Environmental Attributes	Description	Design and Planning (Positive / Negative Impact	During Construction – (Positive / Negative Impact)	Post Construction (Positive / Negative Impact)
				condition structural properties
Geological Stability	The geology is rocky but stable	**Positive**, test pit excavations will only be limited to the sample points	**Positive**, the ground will only be excavated limited along the surveyed pipeline route	**Negative**, the excavated portion of the pipeline will soft and dry during backfilling process and will take longer to harden to pre-soil condition structural properties
Groundcover	Natural veld with heavy alien infestation	**Positive**, test pit excavations will only be limited to the sample points	**Negative**, as the natural veld cover will be lost during the excavations	**Negative**, as the natural veldcover will take time to reestablish itself to pre-existing environment
Groundcover	Natural veld with heavy alien		**Positive**, as the alien vegatation will be	**Positive**, as the alien vegatation will be

Environmental Attributes	Description	Design and Planning (Positive / Negative Impact	During Construction – (Positive / Negative Impact)	Post Construction (Positive / Negative Impact)
	infestation		cleared during the excavations	cleared during the excavations
Land use character of surrounding area	The area is charecterised by vacant land, followed by rural community settlement. The pipeline crosses streams along distribution network	**Positive,** test pit excavations will only be limited to the sample points	**Negative**, along the pipeline route as the area will need be cordoned off as the construction progresses. The communal space will be lost where the pipeline crosses.	**Negative**, as the pipeline will now establish a new servitude and limited land use character of surrounding area will be minimised
Cultural and Historical Features	There are no cultural/historical features affected by the pipeline	**Positive,** as there are no cultural and historical features affected by the pipeline route	**Positive,** as there are no cultural and historical features affected by the pipeline route	**Positive,** as there are no cultural and historical features affected by the pipeline route

Environmental Attributes	Description	Design and Planning (Positive / Negative Impact	During Construction – (Positive / Negative Impact)	Post Construction (Positive / Negative Impact)
Social and Economic aspect	The project will create employment opportunities during construction phase	**Positive**, as the project will be creating jobs and improving the lives of the community as there will now be acess to basic serives –water in this case	**Positive**, as the project will be creating jobs and improving the lives of the community as there will now be acess to basic serives –water in this case	**Positive**, as the project will be creating jobs and improving the lives of the community as there will now be acess to basic serives –water in this case

H.8 The possible mitigation measures that could be applied and level of residual risk

Table 21 demonstrate mitigation measures to negate negative impacts on the environmental attributes.

Table 20: Mitigation Measures to negate Negative Impacts on the Environmental Attributes

Environmental Attribute	Impact	Construction Stage	Mitigation Measures
Soil	**Negative,** the excavated portion of the pipeline will soft and dry during backfilling process and will take longer to harden to pre-soil condition structural properties	Post Construction	The backfilling and compaction of soil material must be supervised by a Professional Engineer to at best be pre-natural soil conditions
Geological Stability	**Negative,** the excavated portion of the pipeline will soft and dry during backfilling process and will take longer to harden to pre-soil condition structural properties	Post Construction	The backfilling and compaction of soil material must be supervised by a Professional Engineer to at best be pre-natural soil conditions
Groundcover	**Negative**, as the natural veld cover will be lost during the excavations	During Construction	Top soil stock piling must be well protected and cordoned off from other soil material generated on site, so as to allow natural seeds to regerminate successfully during the rehabilitation of construction

Environmental Attribute	Impact	Construction Stage	Mitigation Measures
			works
Groundcover	**Negative**, as the natural veldcover will take time to reestablish itself to pre-existing environment	Post Construction	A Specialist Rehabilitation Specialist/ contractor must be appointed to develop rehabilitation plan prior to constrction and implement it post construction. The purpose is to rehablitate the construction footprint to closest the natural state of the site.
Land use character of surrounding area	**Negative**, along the pipeline route as the area will need be cordoned off as the construction progresses. The communal space will be lost where the pipeline crosses.	During Construction	The contractor construction schedule should only be allowed to excavate reasonable length of excavation pit to layoff pipelines, backfill and compact the area to minimise disruption or occupancy of land normally used as communal space.

Environmental Attribute	Impact	Construction Stage	Mitigation Measures
Land use character of surrounding area	**Negative**, as the pipeline will now establish a new servitude and limited land use character of surrounding area will be minimised	Post Construction	The pipeline survey and positioning decision should be based on the least based execution whereby it is aligned to existing servitudes at all times

H.9 The outcome of the site selection matrix

Therefore in deciding the least cost option of the pipeline and environmental consideration matrix of the following set of data was utilized:

- existing infrastructure,
- existing roads reserve,
- legal servitudes,
- access roads,
- gravity and critical water pressure points.

H.10 If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such.

The area under development has long being developed and established rural settlement. The road infrastructure as well as servitudes have been developed based on the topography, geological, ecological and land use management for the area.

In developing this type of schemes for service delivery to the target communities, the municipality considers the capital cost of deployment, operations cost and maintenance costs of the system . This cost must be effective, efficient and sustainable in the long term for the benefit of the council and community at large.Therefore during planning this considerations are taken into account.

Thus, it was prudent for the municipality to follow and align the pipeline development adjacent existing road servitude in the majority of the pipeline network. Second added benefit was that certain circumstances there were already built bridges and stormwater channels to cross over the water crossings as well as wetlands systems present in the area.

Hence they have not considered any new pipeline route, that will have increased cost of deployment to offsets topography, geology, ecology and land use but follow the current road servitude.

H.11 A concluding statement indicating the preferred alternatives, including preferred location of the activity

Water is an essential resource to the survival of human kind. The water backlog is being experienced in almost all areas within the municipality. The district has invested a considerable amount towards the eradication of this backlog.
In developing this type of schemes for service delivery to the target communities, the municipality considers the capital cost of deployment, operations cost and maintenance costs of the system . This cost must be effective, efficient and sustainable in the long term for the benefit of the council and community at large. Therefore during planning this considerations are taken into account.

Therefore in deciding the least cost option of the pipeline, the environmental consideration matrix of the following was utilized:

- using existing infrastructure,
- using existing roads reserve,
- following existing legal servitudes,
- using current access roads,
- gravity and critical water pressure points.

The proposed pipeline will utilize the existing road reserve toward the target community region, of which will cause least environmental degradation to the geaogrpahy, landscape, and land use charecteristics.

I. Full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of activity, including

Table 22 to Table 25 shows the environmental significance of impacts and risk identified for the identified alternative (preferred option) both pre-mitigation measures and post-mtigation measures. The environmental significance rating of each aspects pre and post mitigation measures is contained in **Appendix 15**.

The cummaltive impacts associated with the project life cycle is demonstrated in **Table 26 to Table 28**.

Table 21: Environmental Significance of Impacts of Prefered Alternative during Design and Planning Phase

DESIGN AND PLANNING PHASE

Potential impacts:	Significance rating of impacts:	Proposed mitigation:	Significance rating of impacts after mitigation:
Loss of vegetation	**None**	▪ Minimize vegetation destruction to minimum area of Test pit excations along the sampling points for geotechnical assessment.	**None**
Soil Erosion	**None**	▪ Top soil removed during Test pit excations along the sampling points for geotechnical assessment must be backfilled and leveled to prior natural conditions	**None**
Water pollution	**None**	▪ Test pit excavation to be conducted outside 100m of the banks of water courses	**None**
Dust generation	**None**	▪ TLB's to only be driven in area that is identified for sampling	**None**
Hazardous Substance contamination	**None**	▪ The TLB's must be provided with drip trays when not in use	**None**
Noise generation	**None**	▪ Avoid excessive revving and ignition of equipment.	**None**
Waste pollution	**None**	▪ Dispose waste at registered waste disposal facility	**None**
Fire ignition	**None**	▪ TLB's to always have fire extinguishers and have employees trained on their use	**None**
Loss of fauna and Flora	**None**	▪ Test pit excavation to be conducted outside 100m of the banks of water courses ▪ Minimize vegetation destruction to minimum area of Test pit excations along the sampling points for geotechnical assessment.	**None**

DESIGN AND PLANNING PHASE

Potential impacts:	Significance rating of impacts:	Proposed mitigation:	Significance rating of impacts after mitigation:
Damage to existing infrastructure e.g. sewage lines	**None**	▪ Infrastructure mapping and confirmation.	**None**
Injury to public and animals due to falling into workings	**None**	▪ Prevent unauthorized entry to the working area	**None**
Traffic congestion	**None**	▪ Avoid traffic jamming e.g. move machinery and plant outside of rush hour ▪ Plan work area to minimize traffic obstruction	**None**
Traffic incidents	**None**	▪ Install illuminating warning lights, traffic calming structures, etc. ▪ Use flagman to slow and direct traffic	**None**
Pedestrian injuries and route closures	**None**	▪ Redirect pedestrians away from working areas ▪ Use barricades and signage ▪ Prevent unauthorized access to working areas	**None**
Stormwater Management	**None**	▪ The contractor will be advised to implement proper storm management plan	**None**
Cultural Heritage Resources	**None**	▪ If any cultural and heritage resources can be discovered on the proposed site the construction will have to be halted and the case be reported to SAPS.	**None**

Table 22: Environmental Significance of Impact of the Prefered Alternative during Construction Phase

CONSTRUCTION PHASE

Potential impacts:	Significance rating of impacts:	Proposed mitigation:	Significance rating of impacts after mitigation:
Loss of vegetation	**Low**	▪ Minimize vegetation destruction to minimum area where construction operations are.	**None**
Soil Erosion	**Low**	▪ Minimize vegetation destruction to minimum area where construction operations are. ▪ Divert stormwater away from the disturbed areas and loose soils ▪ Compact well after pipe laying ▪ Cover soil heaps to prevent erosion	**None**
Water pollution	**Low**	▪ Avoid soil erosion (see above) ▪ Avoid loss of vegetation (see above)	**None**
Dust generation	**Low**	▪ Limit loss of vegetation (see above) ▪ Avoid over movement of plant on site ▪ Limit speed to 20km/hr. or less in the construction site ▪ Apply dust suppression regularly and as required ▪ Cover soil heaps	**None**
Hazardous Substance contamination	**Medium**	▪ Avoid refueling onsite ▪ Refueling to occur at designated areas and with drip trays installed ▪ Training of substance handlers for correct handling	**None**
Noise generation	**Low**	▪ Proper plant, machinery and motor maintenance ▪ Use noise reduction apparatus where applicable ▪ Avoid excessive revving and ignition of equipment. ▪ Operational hours between 07h00 and 17h00	**None**

Waste pollution	**Medium**	▪ Use dedicated waste bins ▪ Practice waste separation (General and Hazardous) ▪ Dispose waste at registered waste disposal facility	**None**
Fire ignition	**Low**	▪ Avoid lighting fires on site ▪ Ban smoking near flammable substances ▪ Ensure correct handling of flammable substances ▪ Have fire extinguishers and have employees trained on their use	**None**
Loss of fauna and Flora	**Low**	▪ Avoid vegetation loss (see above) ▪ Avoid fires (see above) ▪ Avoid hazardous substance contamination of soil and water (see above) ▪ Prevent collection/capture of fauna by employees	**None**
Damage to existing infrastructure e.g. sewage lines	**Low**	▪ Infrastructure mapping and confirmation. ▪ Servitude applications ▪ Contingency and emergency measures	
Injury to public and animals due to falling into workings	**Low**	▪ Prevent unauthorized entry to the working area ▪ Barricade all works with barricade fence ▪ NO ENTRY and DANGER signs erected and maintained ▪ Smallest lead times between trenching and pipe burying. ▪ Close dig-up areas as soon as pipes have been laid.	**None**
Traffic congestion	**Medium**	▪ Avoid traffic jamming e.g. move machinery and plant outside of rush hour ▪ Move plant and machinery away from high traffic areas ▪ Plan work area to minimize traffic obstruction	**None**
Traffic incidents	**Medium**	▪ Avoid traffic congestion (see above) ▪ Implement traffic safety measures	**None**

		▪ Install illuminating warning lights, traffic calming structures, etc. ▪ Use flagman to slow and direct traffic	
Pedestrian injuries and route closures	**Medium**	▪ Redirect pedestrians away from working areas ▪ Use barricades and signage ▪ Prevent unauthorized access to working areas	**None**
Stormwater Management	**Low**	▪ The contractor will be advised to implement proper storm management plan	**None**
Cultural Heritage Resources	**Low**	▪ If any cultural and heritage resources can be discovered on the proposed site the construction will have to be halted and the case be reported to SAPS.	**None**

Table 23: Environmental SIgnificance of Impact on the Prefered Alternative during Decommisioning Phase

DECOMMISIONING PHASE

Potential impacts:	Significance rating of impacts:	Proposed rehabilitation measures	Significance rating of impacts after rehabilitation measures
Loss of vegetation	**Medium**	▪ Topsoil removed must be used to level the area, in order to allow the seeds to regerminate ▪ Indigenous vegetation (if any) will need to be relocated and planted again	**None**
Soil Erosion	**Low**	▪ Rows of straw, hay or bundles of cut vegetation may also be used. In this instance, the hay, straw or vegetation is dug into the soil in contours, in order to help slow surface wash and capture eroded soil. ▪ The spacing between rows would be dependant on slope and the specific area.	**None**
Water pollution	**Low**	▪ Waste Materials collected on site after decommisiong the site must not be diverted into nearby water courses	**None**
Dust generation	**Medium**	▪ Avoid over movement of plant on site ▪ Limit speed to 20km/hr. or less in the construction site	**None**
Hazardous Substance contamination	**Medium**	▪ Refueling to occur at designated areas and with drip trays installed ▪ All waste material generated on site must be disposed off at registererd hazardous landfill site. ▪ Proof of disposal must be made available to Site Engineer	**None**
Noise generation	**Low**	▪ Avoid excessive revving and ignition of equipment. ▪ Operational hours between 07h00 and 17h00	**None**
Waste pollution	**Medium**	▪ Use dedicated waste bins ▪ Practice waste separation (General and Hazardous) ▪ Dispose waste at registered waste disposal facility	**None**

DECOMMISIONING PHASE

Potential impacts:	Significance rating of impacts:	Proposed rehabilitation measures	Significance rating of impacts after rehabilitation measures
Fire ignition	**Low**	▪ Avoid lighting fires on site ▪ Ban smoking near flammable substances ▪ Ensure correct handling of flammable substances ▪ Have fire extinguishers and have employees trained on their use	**None**
Loss of fauna and Flora	**Low**	▪ Rehabilitate the area workings within the water course to allow natural flows ▪ Remove structures that can impede natural flow in the water ▪ Use Gabion baskets and Rhino mattress to stabilize river banks	**None**
Damage to existing infrastructure e.g. sewage lines	**Low**	▪ Infrastructure mapping and confirmation. ▪ Servitude applications ▪ Contingency and emergency measures	**None**
Injury to public and animals due to falling into workings	**Low**	▪ Prevent unauthorized entry to the working area ▪ Barricade all works with barricade fence ▪ NO ENTRY and DANGER signs erected and maintained ▪ Smallest lead times between trenching and pipe burying. ▪ Close dig-up areas as soon as pipes have been laid.	**None**
Traffic congestion	**Medium**	▪ Avoid traffic jamming e.g. move machinery and plant outside of rush hour ▪ Move plant and machinery away from high traffic areas	**None**

DECOMMISIONING PHASE

Potential impacts:	Significance rating of impacts:	Proposed rehabilitation measures	Significance rating of impacts after rehabilitation measures
		▪ Plan work area to minimize traffic obstruction	
Traffic incidents	**Medium**	▪ Avoid traffic congestion (see above) ▪ Implement traffic safety measures ▪ Install illuminating warning lights, traffic calming structures, etc. ▪ Use flagman to slow and direct traffic	**None**
Pedestrian injuries and route closures	**Medium**	▪ Redirect pedestrians away from working areas ▪ Use barricades and signage ▪ Prevent unauthorized access to working areas	**None**
Stormwater Management	**Low**	▪ The design of drainage and stormwater pipes should be to reduce flow velocity and avoid soil erosion. This can be achieved through the construction of water velocity dissipators below the pipe head wall. ▪ Rocks, boulders or concrete blocks may be utilised for these purposes, and they are set into the concrete pron below the headwall. Stone pitching may also be utilised.	**None**

Table 24: Environmnetal Significance of Impact of Prefered Alternative during Operation Phase

OPERATION PHASE

Potential impacts:	Significance rating of impacts:	Proposed mitigation measures	Significance rating of impacts after rehabilitation measures
Soil Erosion	**Low**	▪ Implement the appropriate topsoil and stormwater runoff control management measures to prevent the loss of topsoil. ▪ The site should be graded well to permit drainage and to prevent ponding	**None**
Water pollution	**Low**	▪ A comprehensive water pressure management must be adhered to prevent pressure build ups resulting in pipe burst ▪ A use pressure reducing valves must be implemented	**None**
Loss of fauna and Flora	**Low**	▪ Trees and shrubs conserved shall be clearly introduced to the site under the supervision of the Project Enginner. ▪ This trees cannot be planted directly on the pipeline, but appropriate planting site must be negotiated well with all interest and affected parties ▪ Pipeline crossing over the stream must always be freed of debris building up	**None**
Damage to existing infrastructure e.g. sewage lines	**Low**	▪ Infrastructure mapping and confirmation. ▪ Servitude applications ▪ Contingency and emergency measures	**None**
Traffic incidents	**Medium**	▪ A comprehensive water pressure management must be adhered to prevent pressure build ups resulting in pipe burst	**None**

OPERATION PHASE

Potential impacts:	Significance rating of impacts:	Proposed mitigation measures	Significance rating of impacts after rehabilitation measures
		▪ A use pressure reducing valves must be implemented ▪ Implement traffic safety measures in case of pipe burst ▪ Install illuminating warning lights, traffic calming structures, etc. should flooding be the resultant impact ▪ Use flagman to slow and direct traffic	
Pedestrian injuries and route closures	**Medium**	▪ Redirect pedestrians away from pipe burst areas ▪ Use barricades and signage ▪ Prevent unauthorized access to working areas	**None**
Stormwater Management	**Low**	▪ Ensure effective storm water management will be exercised to limit negative impacts on the environment and enhance the positive impacts ▪ All contaminated standing water should be immediately removed and treated or disposed of appropriately. ▪ Surfaces and conduits should be constructed to drain the run off more efficiently	**None**

Table 25: Cumulative Impacts of Prefered Alternative during Construction Phase

CONSTRUCTION PHASE

Potential impacts:	Significance rating of impacts:	Proposed mitigation:	Significance rating of impacts after mitigation:	Cumulative Impact
Hazardous Substance contamination	**Medium**	▪ Avoid refueling onsite ▪ Refueling to occur at designated areas and with drip trays installed ▪ Training of substance handlers for correct handling	**None**	Loss of land capability and groundwater pollution due to Oil and Grease contamination
Waste pollution	**Medium**	▪ Use dedicated waste bins ▪ Practice waste separation (General and Hazardous) ▪ Dispose waste at registered waste disposal facility	**None**	Creation of illegal dumping site and could cause significant health hazard to the surrounding community and living animals
Traffic congestion	**Medium**	▪ Avoid traffic jamming e.g. move machinery and plant outside of rush hour ▪ Move plant and machinery away from high traffic areas ▪ Plan work area to minimize traffic obstruction	**None**	Traffic Congestions may lead to illegal driving and creation of alternative routes around the works leading to damage of the surrounding environments, and infrastructure.
Traffic incidents	**Medium**	▪ Avoid traffic congestion (see above) ▪ Implement traffic safety measures ▪ Install illuminating warning lights, traffic calming structures, etc.	**None**	Road closures my lead to road rages by motorist to fellow motorists or pedestrians

CONSTRUCTION PHASE

Potential impacts:	Significance rating of impacts:	Proposed mitigation:	Significance rating of impacts after mitigation:	Cumulative Impact
		▪ Use flagman to slow and direct traffic		
Pedestrian injuries and route closures	**Medium**	▪ Redirect pedestrians away from working areas ▪ Use barricades and signage ▪ Prevent unauthorized access to working areas	**None**	Public injuries may lead to negativity by the communities against the project

Table 26: Cumalative Impact of Prefered Alternative during Decommisioning Phase

DECOMMISIONING PHASE

Potential impacts:	Significance rating of impacts:	Proposed rehabilitation measures	Significance rating of impacts after rehabilitation measures	Cumulative Impact
Loss of vegetation	**Medium**	▪ Topsoil removed must be used to level the area, in order to allow the seeds to regerminate ▪ Indigenous vegetation (if any) will need to be relocated and planted again	**None**	▪ Loss of indigenous vegetation through seeds not regerminating at right season
Dust generation	**Medium**	▪ Avoid over movement of plant on site ▪ Limit speed to 20km/hr. or less in the construction site	**None**	▪ Loss of vegetation post construction due to leaves suffocating under accumulated dust
Hazardous Substance contamination	**Medium**	▪ Refueling to occur at designated areas and with drip trays installed ▪ All waste material generated on site must be disposed off at registererd hazardous landfill site. ▪ Proof of disposal must be made available to Site Engineer	**None**	▪ Loss of land capability and groundwater pollution due to Oil and Grease contamination
Waste pollution	**Medium**	▪ Use dedicated waste bins ▪ Practice waste separation (General and Hazardous) ▪ Dispose waste at registered waste disposal facility	**None**	▪ Creation of illegal dumping site and could cause significant health hazard to the surrounding community and living animals

DECOMMISIONING PHASE

Potential impacts:	Significance rating of impacts:	Proposed rehabilitation measures	Significance rating of impacts after rehabilitation measures	Cumulative Impact
Traffic congestion	**Medium**	▪ Avoid traffic jamming e.g. move machinery and plant outside of rush hour ▪ Move plant and machinery away from high traffic areas ▪ Plan work area to minimize traffic obstruction	**None**	▪ Traffic Congestions may lead to illegal driving and creation of alternative routes around the works leading to damage of the surrounding environments, and infrastructure.
Traffic incidents	**Medium**	▪ Avoid traffic congestion (see above) ▪ Implement traffic safety measures ▪ Install illuminating warning lights, traffic calming structures, etc. ▪ Use flagman to slow and direct traffic	**None**	▪ Road closures my lead to road rages by motorist to fellow motorists or pedestrians
Pedestrian injuries and route closures	**Medium**	▪ Redirect pedestrians away from working areas ▪ Use barricades and signage ▪ Prevent unauthorized access to working areas	**None**	▪ Public injuries may lead to negativity by the communities against the project

Table 27: Cumulative Impact of Prefered Alternative during the Operation Phase

OPERATION PHASE

Potential impacts:	Significance rating of impacts:	Proposed mitigation measures	Significance rating of impacts after rehabilitation measures	Cumulative Impact
Traffic incidents	**Medium**	▪ A comprehensive water pressure management must be adhered to prevent pressure build ups resulting in pipe burst ▪ A use pressure reducing valves must be implemented ▪ Implement traffic safety measures in case of pipe burst ▪ Install illuminating warning lights, traffic calming structures, etc. should flooding be the resultant impact ▪ Use flagman to slow and direct traffic	**None**	▪ Background leaking of pipelines, that leads unaccounted for water in the system
Pedestrian injuries and route closures	**Medium**	▪ Redirect pedestrians away from pipe burst areas ▪ Use barricades and signage ▪ Prevent unauthorized access to working areas	**None**	▪ Background leaking of pipelines, that leads unaccounted for water in the system

J. A summary of the findings and impact management measures identified in any of specialist report complying with Appendix 6 to these regulations and a indication as to how these finding and recommendations have been included in the final report

The summary of the impact assessment of specialist studies will be captured here.

K. An environmental impact statement

The impact associated with the construction of Bulkwater Supply Pipeline Project for Ward 29 in Mbizana Local Municipality have been adequately assessed in this report at different phase of the life of activity of the project i.e planning and design phase, construction phase, decommissioning phase and operational phase.

A map is attached herewith in **Appendix 16** showing the proposed activity and its associated infrastructure in relation to environmental sensitivity of the site. The objective here is delineate where feasible the areas that are sensitive and proper care and due diligence must be activated during the construction, rehabilitation and operation of the project. **Appendix 21** details the proposed Engineering Design of the Bulkwater Supply Pipeline Project for Ward 29 in Mbizana Local Municipality.

There will be less environmental significance during the planning and design phase, as much of the work is designed around ground trothing and review of the information in the general public domain. However there is an aspects of surveying and geotechnical assessments asscoaited with this phase, which if not properly managed and controlled can have detrimental impact to the environment. In this case of this project, these aspects will have less environmental significance.

During the construction phase, there are aspects of construction that needs to managed accordingly to reduce the environmental significance of the impacts. The Environmental Management Programme (EMPr) to manage and monitor mitigation of this impacts by the contractor.

Although an aspect might have a rating of none or low environmental significance, that aspect might have cumulative impact if not properly managed. In this case some of issues such as management of soil generated

on site as well as loss of vegetation, noise of construction machinery and traffic management if not properly mitigated can have high environmental significance and makes the whole project undesirable to the environment.

Aspect such as, refueling at dedicated fuel storage, improper waste management practices and insufficient traffic management practice have a medium environmental significance. If the aspects are not monitored as per the recommended mitigation measures, they will also trigger high environmental significance, and thus the desirable objective of the will not be realized. This will have negative consequences as the community will continue without access to basic service guaranteed by the Constitution of the Republic of South Africa.

It is therefore desirable that the Project Manager appoint the Environmental Control Officer whom's primary responsibility is to ensure compliance by the Contractor with all the mitigation measures contained in the EMPr.

The negative environmtal impact of the project on the environmental attributes are far outweighed by the sole delivery of the basic services of water provision to the people. The pipeline will only be using the current approved servitutes, road reserve and infrastructe delivery route. Therefore, although there will be such negative effect on the environment, the mititigation measures recommended must be adhered to as will be outlined in the EMPr.

It is therefore imperative that EMPr is well versed with the contractor during the construction and rehabilitation phase. Also the Rehabiliatation Specialist must be appointed prior to starting with construction, so that world class rehabilitation practices are adopted before construction commences.

L. Environmental Management Programme including where applicable impact management measures from specialist report, the recording of the proposed impact management objectives, and the impact management outcomes for the development

The Environmental Management Programme is attached herewith in **Appendix 17** of this report.

M. Any aspects which were conditional to the finding of the assessment either by the EAP or specialist which are to be included as conditions of authorization

- The applicant should implement the project mostly in the dry season where the river flows are low. This will therefore minimize the impact of the construction activities and rehabilitation efforts to the stream flow activities.
- In a situation whereby the construction activites are within a river course, water quality of the stream must measured prior to construction and post construction to assess the impact of the construction. The Environmental Control Officer must monitor the process, approve the Method Statements of Contractors and file the results for the record. The samples must be collected upstream and downstream of the river course.

N. A description of any assumptions, uncertainities, gaps in knowledge which relate to the assessment and mitigation measures proposed

Consideration should be given to the following acknowledged limitations to this further assessment:

- Due to the episodic nature of the ephemeral drainage lines the volume of water moving through the landscape can be unavoidably underestimated and therefore it's crucial that appropriate measures are put in place to ensure protection of the water infrastructure and co-existence of these systems water infrastructures post construction.
- Given the size of the study area and the extent of the watercourses crossings, not every ephemeral drainage line are assessed but a representative sample considering types exhibited similar characteristics.
- Due to the scale of the study area, and the undulating nature of the topography, only ephemeral streams deemed to be hydrological (and ecologically) important were mapped.

Despite the limitations mentioned above, it is believed that an adequate understanding of the watercourses has been developed to provide practical management measures associated with the proposed pipelines on site.

O. A reasoned opinion as to whether the proposed activity should or should not be authorized, and if the opinion is that it should be authorized, any conditions that should be made in respect of that authorization

Water is an essential resource to the survival of human kind. Alfred Nzo District Municipality as Water Serice Authority is properly legislated and mandated within the three spheres of government to provide water services to the communities within it municipal jurisdiction boundaries. The current assessment of water service provision within Mbizana Local Municipality shows that, the municipality experience water backlog. People supplement this lack of provision of water by the municipality by fetching water from rivers or flowing streams to meet their living needs amidst the water pollution experienced by our natural water resouces. This is despite the non negotiable guarantees the supreme law of the country affords every citizen whom is born in the Republic of South Africa.

It is therefore heart warming the conceptualization and intent to implement this kind of the scheme by Alfred Nzo District Municiaplity defying the odds faced by our local authorities in the country in ensuring that community of Bizana realize this ideal enshrined in the constitution.

The environmental impact assessment concluded that, yes, during implementation of magnitude of this project there will be temporal loss of certain environmental attributes along the route of target delivery community. Thus, we have appreciated that and acknowledge the loss. However the profound nature of this scheme negates the temporal environmental losses we are going to lose. We still have to protect same by the way. But the mitigation measures we recommend to be put in place to manage this less environmental significance impacts, should allow us to restore the environment to its close pristine conditions albeit not equivalent.

It is against this background that, I have assessed and processed all the possible environmental impacts within my knowledge that could be associated

with The Construction of Alfred Nzo Bulk Water Supply Scheme for Ward 29 in Mbizana Local Municipality and its desirable objectives, thus:-

I can , soundly recommend to the Eastern Cape Province Department of Economic Development, Environmental Affairs and Tourism to authorize Construction of Alfred Nzo Bulk Water Supply Scheme for Ward 29 in Mbizana Local Municipality as proposed by Alfred Nzo District Municipality.

This recommendation has the following bearing on to Municipality implementing in its entirety the mitigation measures and conditions suggested elsewhere in this report, contained in the **Environmental Management Programme (EMPr) dated April 2017** and further management measures and conditions recommended by the responding Authority.

P. Where the proposed activity does not include operational aspects, the period for which the environmental authorization is required, the date on which the activity will be concluded, and the post construction monitoring requirements

The proposed activity is a service delivery project. The project will be operatated and maintained continuously in line with the life-cycle of the bulkwater pipeline.

Q. An undertaking under oath or affirmation by the EAP in relation to:

I, **KGOMOTSO MOTSEPE** declare that I

- am the independent environmental practitioner in this application;
- will comply with the requirements for an EAP as stipulated in Regulation 13 of the EIA Regulations, 2014;
- do not have and will not have any vested interest (either business, financial, personal or other) in the undertaking of the proposed activity, other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 20144;
- will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- declare that there are no circumstances that may compromise my objectivity in performing such work;
- have expertise in conducting environmental impact assessments, including knowledge of the National Environmental Management Act, 1998 (Act107 of 1998), regulations and any guidelines that have relevance to the proposed activity;
- will comply with the National Environmental Management Act, 1998 (Act107 of 1998), regulations and all other applicable legislation;
- undertake to disclose to the applicant and the KZN Department of Economic Development, Tourism & Environmental Affairs all material information in my possession that reasonably has or may have the potential of influencing its decision with respect to this application;
- will ensure that information containing all reports in respect of this application is distributed or made available to interested and affected parties and that their participation is facilitated in such a manner that they will be provided with a reasonable opportunity to participate and provide comments on the reports;
- will provide the competent authority with access to all information at my disposal regarding this application, whether such information is favourable to the applicant or not;
- declare that all the particulars furnished by me in this form are true and correct;
- I am aware that a person is guilty of an offence in terms of Regulation 48 (1) of the EIA Regulations, 2014, if that person provides incorrect or misleading information. A person who is convicted of an offence in terms of sub-regulation 48(1) (a)-(e) is liable to the penalties as contemplated in section 49B(1) of the National Environmental Management Act, 1998 (Act 107 of 1998); and
- I will comply with all the requirements as indicated in the National Environmental Management Act, 1998 (Act 107 of 1998) and Environmental Impact Assessment Regulations, 2014.

Name of the Environmental Assessment Practitioner

Signature of the Environmental Assessment Practitioner

Name of company

Date

Name of Commissioner of Oaths

Signature of Commissioner of Oaths

Date

Designation

Official stamp (below)

R. Where applicable, details of any financial provisions for rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts

None reported here

S. Any specific information that may be required by the competent authority

None reported here

T. Any other matters required in terms of section 24(4)(a) and (b) of the Act

The applicant should notify all state department of the decision of the authority on positive recommendation of the project

The applicant should appoint a qualified and experienced Environmental Control Officer.

The report of the Environmental Control Officer must be made available to the Department within month of completion. The same report should be made to the State Department, whos jurisdiction is affected by the part of the project development.

Although no archaeological heritage remains, features or sites were encountered during the survey the following recommendations should be considered before development proceeds:

- If concentrations of archaeological heritage material and human remains are uncovered during construction, all work must cease immediately and be reported to the South African Heritage Resources Agency (SAHRA) so that systematic and professional investigation/ excavation can be undertaken; and
- The construction managers/ foremen should be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites.
- This site must be properly delianated as "NO-GO Areas" during the entire construction period

No Aquatic Life must be caught during construction by the employees especially during diversions of water courses to complete construction.