



City of Ekurhuleni

**Pomona Outfall Sewer-Serengeti pump station to
ERWAT/ Haartebeesfontein Water Treatment works**

Draft BAR

Department Reference No: GAUT002/18-19/E0054

Locality: Kempton Park

Date: 31 July 2018

SHANGONI
Management Services (Pty) Ltd



DRAFT BASIC ASSESSMENT REPORT

City of Ekurhuleni

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ERWAT/ Haartebeesfontein Water Treatment works**

Draft BAR

Department Reference No: GAUT002/18-19/E0054

Locality: Kempton Park

Date: 31 July 2018

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Management Services (Pty) Ltd

PROJECT DETAILS	
Department of	Gauteng Department of Agriculture and Rural Development
Reference No:	GAUT002/18-19/E0054
Project Title:	Pomona Outfall Sewer-Serengeti pump station to ERWAT/ Haartebeesfontein Water Treatment works
Report Title:	Draft Basic Assessment report
Project Number:	EKU-POM-17-05-25
Compiled by:	Marilyn Govender
Date:	31 July 2018
Revision number:	01
Location:	Kempton Park
Technical Reviewer:	Brian Hayes (Pr.Eng.)



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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, 2014 (Version 1)

Kindly note that:

1. This Basic Assessment Report is the standard report required by GDARD in terms of the EIA Regulations, 2014.
2. This application form is current as of 8 December 2014. It is the responsibility of the EAP to ascertain whether subsequent versions of the form have been published or produced by the competent authority.
3. A draft Basic Assessment Report must be submitted, for purposes of comments within a period of thirty (30) days, to all State Departments administering a law relating to a matter likely to be affected by the activity to be undertaken.
4. A draft Basic Assessment Report (1 hard copy and two CD's) must be submitted, for purposes of comments within a period of thirty (30) days, to a Competent Authority empowered in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended to consider and decide on the application.
5. Five (5) copies (3 hard copies and 2 CDs-PDF) of the final report and attachments must be handed in at offices of the relevant competent authority, as detailed below.
6. The report must be typed within the spaces provided in the form. The size of the spaces provided is 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.
7. Selected boxes must be indicated by a cross and, when the form is completed electronically, must also be highlighted.
8. An incomplete report may lead to an application for environmental authorisation being refused.
9. Any report that does not contain a titled and dated full colour large scale layout plan of the proposed activities including a coherent legend, overlain with the sensitivities found on site may lead to an application for environmental authorisation being refused.
10. 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 application for environmental authorisation being refused.
11. No faxed or e-mailed reports will be accepted. Only hand delivered or posted applications will be accepted.
12. Unless protected by law, and clearly indicated as such, all information filled in on this application will become public information on receipt by the competent authority. The applicant/EAP must provide any interested and affected party with the information contained in this application on request, during any stage of the application process.
13. Although pre-application meeting with the Competent Authority is optional, applicants are advised to have these meetings prior to submission of application to seek guidance from the Competent Authority.

DEPARTMENTAL DETAILS

Gauteng Department of Agriculture and Rural Development
Attention: Administrative Unit of the of the Environmental Affairs Branch
P.O. Box 8769
Johannesburg
2000

Administrative Unit of the of the Environmental Affairs Branch
Ground floor Diamond Building
11 Diagonal Street, Johannesburg

Administrative Unit telephone number: (011) 240 3377
Department central telephone number: (011) 240 2500



(For official use only)

NEAS Reference Number:						
File Reference Number:						
Application Number:						
Date Received:						

If this BAR has not been submitted within 90 days of receipt of the application by the competent authority and permission was not requested to submit within 140 days, please indicate the reasons for not submitting within time frame.

The draft BAR will be submitted to GDARD within 90 days of receipt of the application.

Is a closure plan applicable for this application and has it been included in this report?

No

if not, state reasons for not including the closure plan.

The proposed project forms part of the Pomona eastern outfall sewer pipeline development that is part of the City of Ekurhuleni's master plan. The proposed project will involve the construction of permanent infrastructure and will not require a closure plan.

Has a draft report for this application been submitted to a competent authority and all State Departments administering a law relating to a matter likely to be affected as a result of this activity?

Yes

Is a list of the State Departments referred to above attached to this report including their full contact details and contact person?

If no, state reasons for not attaching the list.

Yes

Have State Departments including the competent authority commented?

No

If no, why?

No comments have been received as this is the draft basic assessment report. This report will be circulated for a period of 30 days to all interested and affected parties including organs of state. All comments received as part of this process will be captured and addressed as part of the final basic assessment report.



SECTION A: ACTIVITY INFORMATION

1. Proposal or development description

Project title (must be the same name as per application form):

Pomona Outfall Sewer – The proposed upgrading of the existing Serengeti pump station and the proposed construction of the rising main from the Serengeti pump station to the Hartbeesfontein/ERWAT Waste Water Treatment Plant.

Select the appropriate box

The application is for an upgrade of an existing development The application is for a new development Other, specify

Does the activity also require any authorisation other than NEMA EIA authorisation?

YES NO

If yes, describe the legislation and the Competent Authority administering such legislation

The proposed activity triggers a Water Use License in terms of National Water Act (NWA) (Act No. 36 of 1998) and is administered by the Department of Water and Sanitation (DWS).

If yes, have you applied for the authorisation(s)?	YES	NO
If yes, have you received approval(s)? (attach in appropriate appendix)	YES	NO

2. 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:

Title of legislation, policy or guideline:	Administering authority:	Promulgation Date:
National Environmental Management Act, 1998 (Act No. 107 of 1998 as amended).	National & Provincial	27 November 1998
EIA Regulations GN 983 & GN 985 (Listing Notice 1 & 3).	National and Provincial	8 December 2014 (As amended)
Water Use License in terms of Section 21 (c) and (i) of the National Water Act (Act No. 36 of 1998) as amended.	Department of Water and Sanitations ("DWS")	1998
National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004) (NEM: AQA).	National & Provincial	24 February 2005
South African Heritage Resource Act, 1999 (Act No. 25 of 1999).	South Africa Heritage Resources Agency ("SAHRA") Provincial Heritage Resources Authority-Gauteng (PHRA-G)	28 April 1999
Occupational Health and Safety Act (No 85 of 1993).	National Department of Labour	23 June 1993
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).	GDARD and Department of Environmental Affairs ("DEA")	2004
Gauteng Provincial Environmental Management	Provincial	May 2015



Framework.		
Ekurhuleni Water Services By-Laws, 2002.	City of Ekurhuleni (“COE”)	2002
Ekurhuleni Solid Waste By-Laws.	City of Ekurhuleni	2002
The National Environmental Management: Protected Areas Act. 2004 (Act No 57 of 2003).	GDARD and Department of Environmental Affairs (DEA)	2003
City of Ekurhuleni Biodiversity Plan.	City of Ekurhuleni	November 2012
Gauteng Conservation Plan Version 3.3 (C-Plan 3.3).	GDARD and Department of Environmental Affairs (DEA)	2011
City of Ekurhuleni Environmental Policy Final.	City of Ekurhuleni	2006
Gauteng Department of Agriculture, Conservation, Environment and Land Affairs Development Guidelines for Ridges.	GDARD	19 April 2001
DEA Guideline on Need and Desirability, Department of Environmental Affairs.	DEA	2017
DEA Public Participation guideline in terms of NEMA	DEA	2017

Description of compliance with the relevant legislation, policy or guideline:

Legislation, policy of guideline	Description of compliance
National Environmental Management Act No. 107 of 1998 (NEMA).	The National Environmental Management Act (Act No. 107 of 1998) (NEMA) is the overarching framework for environmental legislation as well as the Regulations for Environmental Impact Assessment. It sets out the principles that serve as a general framework for environmental planning, as guidelines by reference to which organs of state must exercise their functions and guide other laws concerned with the protection or management of the environment. The application considers the environmental and socio-economic conditions in compliance with the NEMA principles.
The National Environmental Management: Biodiversity Act (Act 10 of 2004).	The Act provides for the management and conservation of South Africa’s biodiversity within the framework of the NEMA. Areas of high biodiversity need to be protected. Should any protected plants be found on site, these will be managed in consultation with GDARD.
The National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008).	No waste management license will be required for the construction or operational phases of the proposed activity. Only a limited amount of solid construction waste will be stored and handled on the site, before being hauled away and dumped at the nearest registered landfill site.
National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004) (NEM: AQA).	During the construction phase, dust and the generation of noise can become a significant factor, especially to the surrounding landowners. However, if the development is well planned and the mitigating measures proposed in the EMPr are successfully implemented, the proposed development’s contribution to air pollution and the generation of air pollution can become less significant.
National Heritage Resources Act, 1999 (Act No. 45 of 1999 (NHRA).	The Act aims to promote the good management of the national heritage resources. According to the Act the SAHRA must be notified during the early planning phases of a project for any development that meets certain criteria. The Agency has been notified as required. Any artefacts uncovered during the construction phase will be reported to SAHRA as provided for in the EMPr.
Occupational Health and Safety Act (No 85 of	The Act provides for the health and safety of persons at



1993).	work and for the health and safety of persons regarding the use of machinery; the protection of persons other than persons at work, against hazards to health; and safety arising out of or relating to the activities of persons at work. The EMPr provides for measures to ensure that objectives of the Act are met on this site.
EIA Regulations GN 983 (Listing Notice 1) and EIA Regulations GN 985 (Listing Notice 3).	The proposed development constitutes an activity listed under GN R. 983 and GN R. 985 and, therefore, a Basic Assessment Report process is being followed to obtain authorization from the GDARD.
Gauteng Provincial Environmental Management Framework.	The aim of the EMF is to guide the protection and enhancement of environmental assets and natural resources along with development patterns to ensure sustainable environmental management and development patterns within and around the Gauteng Province. The development site is in Zone 1 of the EMF that aims to promote development infill, densification and concentration of urban development within the urban development zones as defined in the Gauteng Spatial Development Framework (GSDF). The proposed development is aligned with and is fully supportive of the objectives of the EMF.
Red List Plant Species Guidelines.	The purpose of the guidelines is to promote the conservation of Red List Plant Species in Gauteng, which are species that face risk of extinction in the wild. By protecting Red List Plant Species, conservation of diverse landscapes is promoted that forms part of the overall environmental preservation of diverse ecosystems, habitats, communities, populations, species and genes in Gauteng.
Gauteng Noise Control Regulations, 1999.	During the construction phase the impact of noise could be problematic, but such impacts are generally short term. One should note that practical mitigation measures for noise pollution are low, but certain measures can be implemented to mitigate the severity. These measures have been provided for in the EMPr.
City of Ekurhuleni Regional Spatial Development Framework.	In terms of the RSDF policy document, as adopted by the City of City of Ekurhuleni ("COE"), the property is situated well within a mixed use with an industrial bias, that may include commercial and light industrial land uses. Higher density residential development is considered appropriate provided that protective development conditions are applied.
Ekurhuleni Biodiversity and open space strategy ("EBOS").	The EBOS serves as a strategy for biodiversity and opens space in the area and is supported by a range of implementation policies that are integral to the Spatial Development Frameworks. The site does not fall within or affect any of the key areas (open spaces and corridors) identified on the EBOS.
City of Ekurhuleni Environmental Policy.	The policy aims at ensuring a safe and healthy environment for those living and working within the COE and that infrastructure and development incorporate environmental considerations. The site is already disturbed and therefore no environmental sensitivities will be compromised.
DEA Guideline on Need and Desirability, Department of Environmental Affairs.	The consideration of proposed developments in context of the various spatial planning tools and policy applicable



	<p>to the proposed development study area have been assessed as part of this report. The “need and desirability” has been determined by considering the broader community’s needs and interests as reflected in the Regional SDF and EMF for the area.</p> <p>It is essential that national policies and strategies support growth in the economy. It is also essential that these policies take cognisance of strategic concerns such as climate change, food security, as well as the sustainability in supply of natural resources and the status of our ecosystem services.</p> <p>To achieve our Constitutional goal of a better quality of life for all now and in future, through equitable access to resources and shared prosperity, it is essential that society improves on the efficiency and responsibility with which we use resources, and improve on the level of integration of social, economic, ecological and governance systems.</p>
<p>DEA Public Participation guideline in terms of NEMA.</p>	<p>According to Section (2)(4)(f) and (o) of NEMA, - the participation of all interested and affected parties (I&APs) in environmental governance must be promoted and all people must have the opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation, and participation by vulnerable and disadvantaged persons must be ensured, and - the environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people’s common heritage.</p> <p>The PPP process conducted as part of the Basic Assessment process is in line with the above-mentioned principles. The PPP process undertaken by Shangoni Management Services is compliant with any regulated procedure related to public consultation and information gathering through the public participation process (PPP).</p>



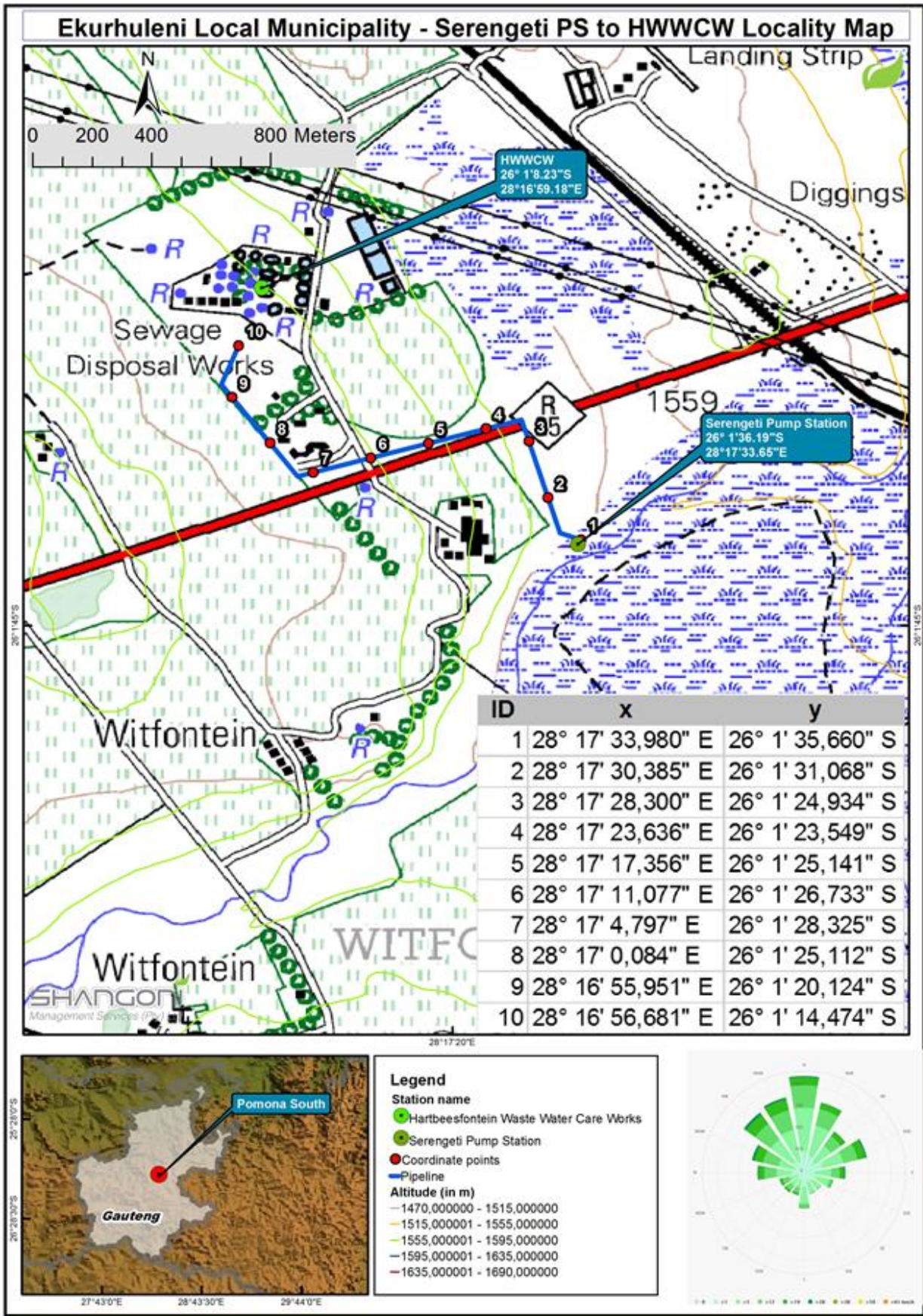
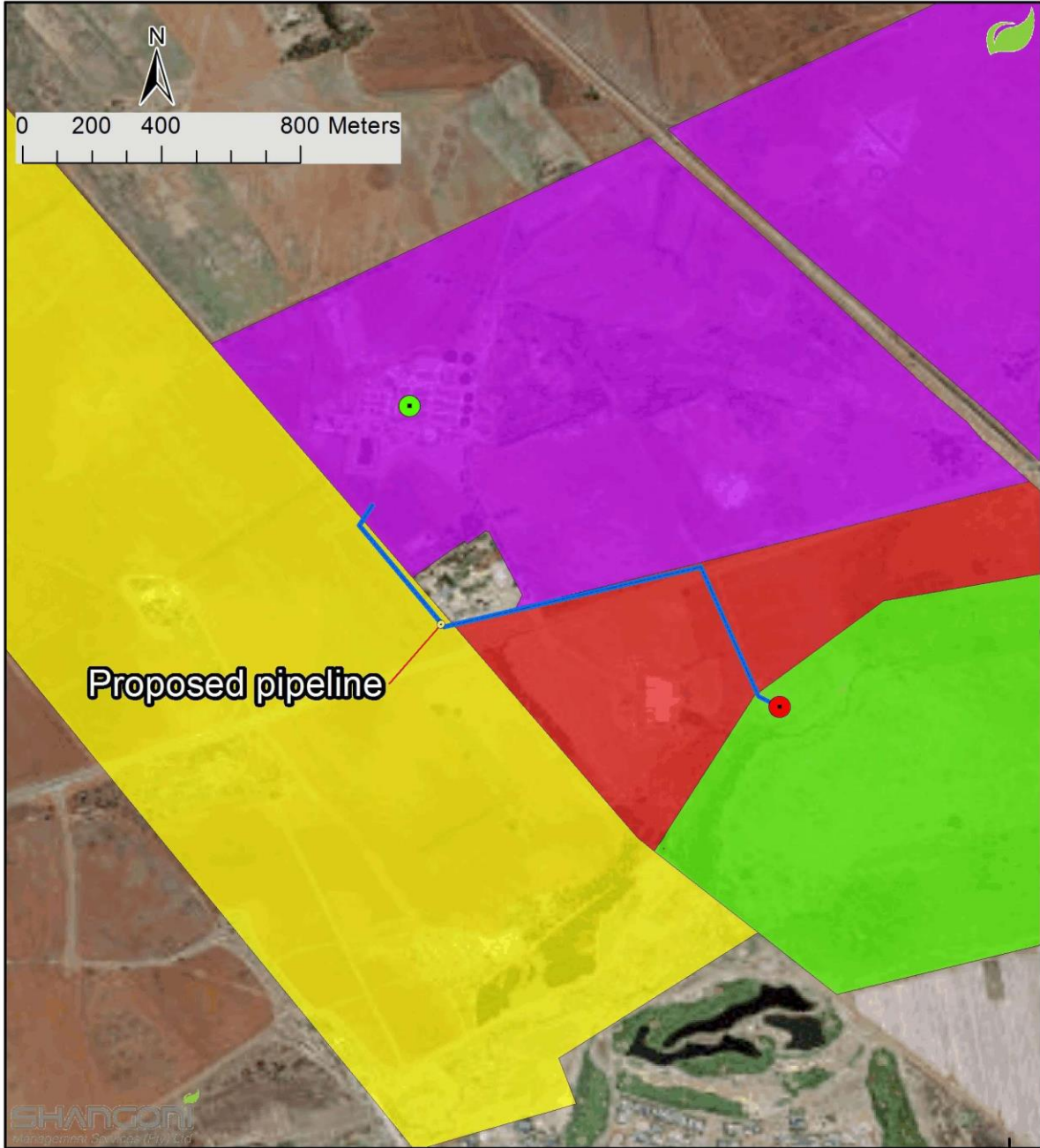


Figure 1: Location of the proposed development

Ekurhuleni Local Municipality - Serengeti PS to HWWCW Affected Properties Map



Legend

- Serengeti PS
 - HWWCW PS
 - Proposed pipeline
- | Affected properties | |
|---|-----------|
| ■ | 21/17-IR |
| ■ | 5/16-IR |
| ■ | R/6/17-IR |
| ■ | R/7/17-IR |

Date: 2018/05/31
 Coordinate System:
 WGS 1984
 Datum: WGS 1984

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Figure 2: Affected properties Map

3. Alternatives

Describe the proposal and 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. The determination of whether the 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.

The no-go option must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. **Do not include the no go option into the alternative table below.**

Note: 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.

Please describe the process followed to reach (decide on) the list of alternatives below:

The proposed upgrading of the existing Serengeti pump station and the proposed construction of the rising main from the Serengeti pump station to the Hartbeesfontein/ERWAT Waste Water Treatment Plant have been assessed in terms of layout alternatives for the proposed rising main. The proposed upgrading activities form part of the existing Serengeti Pump Station.

The Serengeti pump station was designed to be modular as this allowed for the upgrading of the pump station to have 5 phases. This allows for minor upgrades to be made as the demands increase with an increase in development. The following work was completed in terms of the Serengeti Pump station upgrade for Phase 1 and Phase 2: A 355 mm diameter rising main was constructed and the inlet works, mechanical and electrical equipment for phase 1 has been installed. Phase 1 was designed to accommodate the sewer effluent from the Serengeti Gold Estate and the substructure and superstructure of the pump station for Phase 1 and Phase 2 have been constructed.

Proposed Layout (Preferred):

The proposed layout involves the upgrading of the existing Serengeti pump station as well as the construction of a new rising main from the Serengeti pump station to an existing tie in point at the ERWAT waste water treatment plant. The proposed new rising main will follow the existing sewer line layout. The scope of works for the proposed activity is as per the Detailed Design Report (2546/02) dated May 2018, by VIP Consulting engineers.

The proposed project will involve the upgrading of the existing Serengeti pump station as well as the construction of a new rising main from the existing Serengeti Pump station.

A) The proposed upgrading of the Serengeti pump station:

The following activities form part of the proposed upgrading of the existing Serengeti pump station:

- Inlet Works- The inlet work will be for Phase 2-5 as the upgrade of the Serengeti pump station has 5 phases, of which phase 1 has been completed as mentioned above. The new inlet work will consist of screens and sand traps to prevent undue and oversized matter and rubble from flowing into the wet sump and subsequently into the pumps. It is proposed that the screens be operated by hand rakes.
- Sumps: The sump for Phase 2 has been constructed, however, the existing sumps will be upgraded.

Pump Selection: As part of phase 2, provision were made for three pumps in parallel. The insitu pipework in the pump station as well as the plinths have already been constructed as part of phase 1. Two pumps will be installed during the initial lower flow and once the flow increases to over 828 m³/h per pump of 1782 m³/h a third pump will be installed and commissioned. The two pumps will work in parallel with the third pump as backup during failure or maintenance of either of the two pumps.

B) The proposed construction of a new sewer main from the Serengeti pump station to the existing tie in point at ERWAT.



- A high-density polyethylene (HDPE) rising main is proposed along the same route as the existing 355 mm rising main. The proposed route will follow an existing access road to the Serengeti pump station and will then cross the R25 and follow existing informal roads before it connects to the existing ERWAT connection .
- The proposed rising main will be approximately 1.7 km in length with a diameter of approximately 630 mm. The maximum velocity in the rising main at peak flow will be 2.4m/s.
- The rising main will be located within an existing access roads and connect to the existing Hartebeesfontein Outfall Sewer, approximately 1.1 km northwest of the Serengeti pump station.

The current sewage infrastructure (The existing Serengeti pump station and rising main) cannot accommodate any future increases in sewage capacity. The pump station is currently experiencing sewage leaks as the upgrading of the pump station is required to deal with the current and future capacity increases. The proposed project will result in the increased capacity of the existing pump station as well as an increase in efficiency of current and future sanitation service delivery.

Layout Alternative 1 (Not supported)

It must be noted that no layout alternative exists for the proposed upgrading activities as it occurs as part of the existing Serengeti pump station.

Layout alternative 1 provides a layout alternative in terms of the proposed rising main as per the recommendation made by the ecological specialist. The layout will consider moving a section of the proposed pipeline route (Points 1-3 as per figure 1 above) to the west of the access road. The layout will then continue to cross the R25 and tie into the existing connection at ERWAT.

Layout alternative 1 will involve the placement of the section of the pipeline (approximately 434 m) west of the existing access road and within an area that was not previously disturbed by activities such as existing sewer lines and compaction due to use as an access road. Layout alternative 1 creates greater risks to the environment and is not economically viable as the preferred layout (proposed) follows the existing sewer line and will be placed within an existing access road.

Provide a description of the alternatives considered

No.	Alternative type, either alternative: site on property, properties, activity, design, technology, energy, operational or other (provide details of "other")	Description
Location alternatives		
1	Proposal (Preferred)	<p>The proposed project is located in the Witfontein area of Kempton park. The proposed project will involve the upgrading of the existing Serengeti pump station and the construction of a new rising main from the Serengeti pump station to the existing connection at ERWAT. The details of the proposed location the proposed activities are detailed below</p> <p><u>The proposed upgrading of the Serengeti Pump station:</u></p> <p>The proposed upgrading activities will occur at the existing Serengeti pump station. No location alternative exist for the upgrading activities as the proposed activities are site specific.</p> <p><u>The proposed construction of the new rising main:</u></p> <p>The proposed rising main will be located along the R25 and in close</p>



		<p>proximity to the ERWAT offices. The proposed route starts at the Serengeti pump station where it will cross the R25 and tie into the existing connection at ERWAT. The proposed rising main will be approximately 1.7 km in length.</p> <p><i>The proposal is preferred as it occurs within existing access roads and previously disturbed areas. In terms of locality the proposed layout is preferred as it is supported from an economic and environmental perspective.</i></p>
2	Alternative 1	<p>No location alternative exist for the upgrading activities as the proposed activities are site specific to the existing Serengeti pump station.</p> <p>A layout alternative has been proposed by the ecological specialist that recommends that approximately 300 m of the proposed rising main route is moved to the west of the existing access road.</p> <p>This location alternative will involve the disturbance of an area that has historically not been disturbed. The proposed alternative as outlined above involves the placement of the section of the sewer line within an existing access road and follows the layout of the existing sewer line. It is not practical from an economic and environmental aspect to locate the proposed pipeline outside of the existing access road.</p>
Design alternatives		There are no design alternatives for this project.
1	Proposal	
2	Alternative 1	

In the event that no alternative(s) has/have been provided, a motivation must be included in the table below.

4. Physical size of the activity

Indicate the total physical size (footprint) of the proposal as well as alternatives. Footprints are to include all new infrastructure (roads, services etc), impermeable surfaces and landscaped areas:

Proposed activity (***Total environmental (landscaping, parking, etc.) and the building footprint***)

Alternatives:

Alternative 1 (if any)

Alternative 2 (if any)

Size of the activity:

6800 m² (0.68 ha)

Ha/ m²

or, for linear activities:

Proposed activity

Alternatives:

Alternative 1 (if any)

Length of the activity:

1.7 km

m/km

Indicate the size of the site(s) or servitudes (within which the above footprints will occur):

Proposed activity

Alternatives:

Alternative 1 (if any)

Size of the site/servitude:

4 m

4 m
Ha/m²



5. Site access

Proposal

Does ready access to the site exist, or is access directly from an existing road?

YES	NO
m	

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

Describe the type of access road planned:

The proposed sites for the upgrading of the existing Serengeti pump station and the proposed construction of the rising main can be accesses via the R25 and existing access roads.

Include the position of the access road on the site plan (if the access road is to traverse a sensitive feature the impact thereof must be included in the assessment).

Alternative 1

Does ready access to the site exist, or is access directly from an existing road?

YES	
m	

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

Describe the type of access road planned:

Not applicable.

Include the position of the access road on the site plan. (if the access road is to traverse a sensitive feature the impact thereof must be included in the assessment).

PLEASE NOTE: POINTS 6 TO 8 OF SECTION A MUST BE DUPLICATED WHERE RELEVANT FOR ALTERNATIVES

Section A 6-8 has been duplicated Number of times

(only complete when applicable)

6. Layout or route plan

A detailed site or route (for linear activities) plan(s) must be prepared for each alternative site or alternative activity. It must be attached to this document. The site or route plans must indicate the following:

- the layout plan is printed in colour and is overlaid with a sensitivity map (if applicable);
- layout plan is of acceptable paper size and scale, e.g.
 - A4 size for activities with development footprint of 10sqm to 5 hectares;
 - A3 size for activities with development footprint of > 5 hectares to 20 hectares;
 - A2 size for activities with development footprint of >20 hectares to 50 hectares);
 - A1 size for activities with development footprint of >50 hectares);
- The following should serve as a guide for scale issues on the layout plan:
 - A0 = 1: 500
 - A1 = 1: 1000
 - A2 = 1: 2000
 - A3 = 1: 4000
 - A4 = 1: 8000 (±10 000)
- shapefiles of the activity must be included in the electronic submission on the CD's;
- the property boundaries and Surveyor General numbers of all the properties within 50m of the site;
- the exact position of each element of the activity as well as any other structures on the site;
- the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, sewage pipelines, septic tanks, storm water infrastructure;
- servitudes indicating the purpose of the servitude;
- sensitive environmental elements on and within 100m of the site or sites (including the relevant buffers as prescribed by the competent authority) including (but not limited thereto):
 - Rivers and wetlands;
 - the 1:100 and 1:50 year flood line;
 - ridges;
 - cultural and historical features;



- areas with indigenous vegetation (even if it is degraded or infested with alien species);
- Where a watercourse is located on the site at least one cross section of the water course must be included (to allow the position of the relevant buffer from the bank to be clearly indicated)

FOR LOCALITY MAP (NOTE THIS IS ALSO INCLUDED IN THE APPLICATION FORM REQUIREMENTS)

- the scale of locality map must be at least 1:50 000. For linear activities of more than 25 kilometers, a smaller scale e.g. 1:250 000 can be used. The scale must be indicated on the map;
- the locality map and all other maps must be in colour;
- locality map must show property boundaries and numbers within 100m of the site, and for poultry and/or piggery, locality map must show properties within 500m and prevailing or predominant wind direction;
- for gentle slopes, the 1m contour intervals must be indicated on the map and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the map;
- areas with indigenous vegetation (even if it is degraded or infested with alien species);
- locality map must show exact position of development site or sites;
- locality map showing and identifying (if possible) public and access roads; and
- the current land use as well as the land use zoning of each of the properties adjoining the site or sites.

Please refer to Appendix A for Locality Map.

7. Site photographs

Colour photographs from the center 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 the appropriate Appendix. It should be supplemented with additional photographs of relevant features on the site, where applicable.

Please refer to Appendix B for site photographs.

8. Facility illustration

A detailed illustration of the activity must be provided at a scale of 1:200 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 to be attached in the appropriate Appendix.

Please refer to appendix C for the facility illustrations.



SECTION B: DESCRIPTION OF RECEIVING ENVIRONMENT

Section 1: Serengeti pump station to R25 Road (Point 1-3)

Note: Complete Section B for the proposal and alternative(s) (if necessary)

Instructions for completion of Section B for linear activities

- 1) For linear activities (pipelines etc.) it may be necessary to complete Section B for each section of the site that has a significantly different environment.
- 2) Indicate on a plan(s) the different environments identified
- 3) Complete Section B for each of the above areas identified
- 4) Attach to this form in a chronological order
- 5) Each copy of Section B must clearly indicate the corresponding sections of the route at the top of the next page.

Section B has been duplicated for sections of the route

X 2 times

Instructions for completion of Section B for location/route alternatives

- 1) For each location/route alternative identified the entire Section B needs to be completed
- 2) Each alternative location/route needs to be clearly indicated at the top of the next page
- 3) Attach the above documents in a chronological order

Section B has been duplicated for location/route alternatives [REDACTED] times
(complete only when appropriate)

Instructions for completion of Section B when both location/route alternatives and linear activities are applicable for the application

Section B is to be completed and attachments order in the following way

- All significantly different environments identified for Alternative 1 is to be completed and attached in a chronological order; then
- All significantly different environments identified for Alternative 2 is to be completed and attached chronological order, etc.

Section B - Section of Route [REDACTED] (complete only when appropriate for above)

Section B – Location/route Alternative No. [REDACTED] (complete only when appropriate for above)

1. Property description

Property description: (Including Physical Address and Farm name, portion etc.).

Section 1(Point 3) is located outside of the urban area of Kempton park(east of the R21). The surrounding land use is that of the existing Serengeti pump station, informal access roads and light industrial use (Astral food-poultry production).

Proposed upgrading activities (Point 1):

The upgrading of the Serengeti pump station will occur at point 1(the existing Serengeti Pump station). The Serengeti pump station is located on Portion 21 of the farm Hartbeesfontein 171R.

The proposed rising main (Points 1-2-3)



Section 1 of the proposed rising main will start at the existing Serengeti pump station (Point 1) and ends before the R25(Point 3). This is the shorter section of the proposed rising main route. This section of the proposed route is approximately 434 m. The affected properties are Portion 21 of the farm Hartbeesfontein 17IR and the Remaining Extent 7 of the farm Hartbeesfontein 17IR.

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

Alternative:

Latitude (S):

Longitude (E):

In the case of linear activities:

Alternative:

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

	Latitude (S):	Longitude (E):
Point 1	26° 1' 35.660"	28° 17' 33.980"
Point 2	26° 1' 31.068"	28° 17' 30.385"
Point 3	26° 1' 24.934"	28° 17' 28.300"

For route alternatives that are longer than 500m, please provide co-ordinates taken every 250 meters along the route and attached in the appropriate Appendix

Addendum of route alternatives attached

Yes

The 21-digit Surveyor General code of each cadastral land parcel

PROPOSAL- SECTION 1 (POINT 1-3)																					
PORTION 21 OF THE FARM HARTBEESFONTEIN 17IR	T	0	I	R	0	0	0	0	0	0	0	0	0	0	1	7	0	0	0	2	1
REMAINING EXTENT OF PORTION 7 OF THE FARM HARTBEESFONTEIN 17IR	T	0	I	R	0	0	0	0	0	0	0	0	0	0	1	7	0	0	0	0	0

3. Gradient of the site

Indicate the general gradient of the site.

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
------	-------------	-------------	-------------	--------------	-------------	------------------

4. Location in landscape

Indicate the landform(s) that best describes the site.

Ridgeline	Plateau	Side slope of hill/ridge	Valley	Plain	Undulating plain/low hills	River front
-----------	---------	--------------------------	--------	-------	----------------------------	-------------



5. Groundwater, soil and geological stability of the site

a) Is the site located on any of the following?

Shallow water table (less than 1.5m deep)

Dolomite, sinkhole or doline areas

Seasonally wet soils (often close to water bodies)

Unstable rocky slopes or steep slopes with loose soil

Dispersive soils (soils that dissolve in water)

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

Any other unstable soil or geological feature

An area sensitive to erosion

YES	NO
YES	NO
YES	NO
YES	NO
YES	NO
YES	NO
YES	NO
YES	NO

(Information in respect of the above will often be available at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by Geological Survey may also be used).

b) are any caves located on the site(s)

	NO
--	----

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

Latitude (S):

Longitude (E):

--

c) are any caves located within a 300m radius of the site(s)

	NO
--	----

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

Latitude (S):

Longitude (E):

--

d) are any sinkholes located within a 300m radius of the site(s)

	NO
--	----

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

Latitude (S):

Longitude (E):

--

If any of the answers to the above are "YES" or "unsure", specialist input may be requested by the Department

6. Agriculture

Does the site have high potential agriculture as contemplated in the Gauteng Agricultural Potential Atlas (GAPA 4)?

YES	NO
-----	----

Please note: The Department may request specialist input/studies in respect of the above.

7. Groundcover

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

Indicate the types of groundcover present on the site and include the estimated percentage found on site.

Natural veld - good condition % = 40	Natural veld with scattered aliens % =20	Natural veld with heavy alien infestation % = 0	Veld dominated by alien species % = 0	Landscaped (vegetation) % = 0
--	--	--	--	----------------------------------



Sport field % = 0	Cultivated land % = 0	Paved surface (hard landscaping) % = 0	Building or other structure % = 5	Bare soil % = 35
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Please note: The Department may request specialist input/studies depending on the nature of the groundcover and potential impact(s) of the proposed activity/ies.

Wetland specialist input Section 1: Points 1-3

Are there any rare or endangered flora or fauna species (including red list species) present on the site?

YES	NO
------------	-----------

If YES, specify and explain:

Two protected plant species were observed, and these include the orchid *Habenaria falcicornis* (from the untransformed grassland unit) and the iris *Gladiolus crassifolius* (from the semi-transformed grassland unit).

Are there any rare or endangered flora or fauna species (including red list species) present within a 200m (if within urban area as defined in the Regulations) or within 600m (if outside the urban area as defined in the Regulations) radius of the site.

YES	NO
-----	-----------

If YES, specify and explain:

--

Are there any special or sensitive habitats or other natural features present on the site?

YES	NO
------------	----

If YES, specify and explain:

--



The proposed route associated with Section 1(Points 1-3) is located within the Dry Highveld Grassland Ecoregion as indicated in Figure 3 of the SAS Freshwater Resource Assessment dated August 2017. Section 1 of the proposed project is located within a sensitive area as it is situated within a CBA as indicated in Figure 8 of the above-mentioned report.

The proposed upgrading activities that will form part of the existing Serengeti pump station (Point 1) that is located within a watercourse as the existing Serengeti Pump station is located within an unnamed tributary of the Rietvlei river and associated floodplain wetland (indicated in figure 11 of the SAS Freshwater Resource Assessment dated August 2017)

The proposed sewer line as part of section 1(Point 1-3) starts from the existing Serengeti pump station (Point 1) and as mentioned above this area is located within an unnamed tributary of the Rietvlei river and associated floodplain wetland. Point 2-3 of the proposed sewer line is located within a CBA (indicated in figure 8 of the SAS report as mentioned above).

This section of the proposed pipeline is approximately 434 m and forms part of an Ecological Assessment by Pachnoda Consulting dated June 2018. The reports indicated that surrounding environment for section 1 (Points 1-3) of the proposed pipeline route consist of the following characteristics:

- Untransformed Carletonville dolomite grassland (Untransformed)- 34.49%
- Semi-transformed Carletonville dolomite grassland(Semi-transformed)-14.65%
- Secondary Carletonville dolomite grassland(Degraded)-18.92%
- Infrastructure (transformed)-31.94%

Alien vegetation observed along section 1 as per the Ecological Assessment Report by Pachnoda indicated that only declared weed and invader species was observed during the site visit, Solanum sisymbriifolium. It is a Category 1b species that was observed from the semi-transformed and secondary Carletonville Dolomite Grassland. Tecoma stans (Category 1b) and Ailanthus altissima (Category 1b) was observed from nearby discarded building rubble alongside the perimeter of the pump station

The proposed sewer pipeline associated with Section 1 follows the layout of the existing sewer line and will occur within an existing access road.

YES	NO
-----	----

Was a specialist consulted to assist with completing this section
If yes complete specialist details

FRESHWATER ASSESSMENT

Name of the specialist:	C. du Preez- Scientific Aquatic Services CC (SAS)		
Qualification(s) of the specialist:	MSc Environmental Sciences (North West University) BSc (Hons) Environmental Sciences (North West University) BSc Environmental and Biological Sciences (North West University)		
Postal address:	PO Box 751779 Garden view		
Postal code:	2047		
Telephone:	011 616 7893	Cell:	
E-mail:	admin@sasenvironmental.co.za	Fax:	086 724 3132
Are any further specialist studies recommended by the specialist?		YES	NO
If YES, specify:	[REDACTED]		



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

YES	NO
-----	----

If YES list the specialist reports attached below

Signature of specialist:



Date:

20/07/18

ECOLOGICAL ASSESSMENT

If yes complete specialist details

Name of the specialist:

Lukas Niemand Pr.Sci.Nat (Pachnoda Consulting CC)

Qualification(s) of the specialist:

**B.Sc. (Zoology and Entomology).
B.Sc. (Hons) (Entomology).
M.Sc. (Restoration Ecology/Zoology).**

Postal address:

**PO Box 72847
Lynwood Ridge
Pretoria**

Postal code:

0040

Telephone:

(0)12 991 5141

Cell:

E-mail:

lukas@pachnoda.co.za

Fax:

(0) 86 578 3073

Are any further specialist studies recommended by the specialist?

YES	NO
-----	----

If YES, specify:


[Redacted]

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

YES	NO
-----	----

If YES list the specialist reports attached below

Signature of specialist:



Date:

20/07/18

Please note; If more than one specialist was consulted to assist with the filling in of this section then this table must be appropriately duplicated

Fauna & flora specialist input Section 1: Point 1-3

Are there any rare or endangered flora or fauna species (including red list species) present on the site

YES	NO
-----	----

If YES, specify and explain:

[Redacted]

Are there any rare or endangered flora or fauna species (including red list species) present within a 200m (if within urban area as defined in the Regulations) or within 600m (if outside the urban area as defined in the Regulations) radius of the site.

YES	NO
-----	----



If YES, specify and explain:

The Ecological Assessment conducted by Pachnoda Consulting assessed plant species of conservation concern from a desktop study in terms of the habitat conditions and the probability of the species occurring within the study area. The results indicate that the Orchid *Habenaria falcicornis* and the iris *Gladiolus crassifolius* have a moderate probability of occurring in the area (it was not observed during the site visit although the untransformed grassland unit provides potential).

Are there any special or sensitive habitats or other natural features present on the site?

YES	NO
-----	----

If YES, specify and explain:

The proposed pipeline route associated with Points 1-3 is located within the Highveld Ecoregion as indicated in Figure 3 of the SAS Freshwater Resource Assessment dated August 2017. The northern section of the proposed sewer line is situated within a CBA as indicated in Figure 8 of the above-mentioned report. This section of the proposed pipeline is approximately 434 m and forms part of an Ecological Assessment by Pachnoda Consulting dated June 2018. The reports indicated that surrounding environment for section 1 (Points 1-3) of the proposed pipeline route consist of the following characteristics:

- Untransformed Carletonville dolomite grassland (Untransformed)- 34.49%
- Semi-transformed Carletonville dolomite grassland(Semi-transformed)-14.65%
- Secondary Carletonville dolomite grassland(Degraded)-18.92%
- Infrastructure (transformed)-31.94%

The proposed upgrading activities proposed as part of the upgrading of the existing Serengeti Pump station and a small section of the proposed rising main is located within the Flood Plain Wetland associated with the unnamed tributary of the Rietvlei. The location of the proposed activities are indicated in figure 11 of the SAS Freshwater Resource Assessment dated August 2017.

Was a specialist consulted to assist with completing this section
If yes complete specialist details

YES	NO
-----	----

FRESH WATER ASSESSMENT

Name of the specialist:

C. du Preez- Scientific Aquatic Services CC (SAS)

Qualification(s) of the specialist:

**MSc Environmental Sciences (North West University)
BSc (Hons) Environmental Sciences (North West University)
BSc Environmental and Biological Sciences (North West University)**

Postal address:

**PO Box 751779
Garden view**

Postal code:

2047

Telephone:

011 616 7893

Cell:

086 724 3132

E-mail:

admin@sasenvironmental.co.za

/Fax:

086 724 3132

Are any further specialist studies recommended by the specialist?

YES	NO
-----	----

If YES, specify:

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

YES	NO
-----	----

If YES list the specialist reports attached below



Signature of specialist:



Date: 03/04/18

ECOLOGICAL ASSESSMENT

If yes complete specialist details

Name of the specialist:	Lukas Niemand Pr.Sci.Nat (Pachnoda Consulting CC)		
Qualification(s) of the specialist:	B.Sc. (Zoology and Entomology). B.Sc. (Hons) (Entomology). M.Sc. (Restoration Ecology/Zoology).		
Postal address:	PO Box 72847 Lynwood Ridge Pretoria		
Postal code:	0040		
Telephone:	(0)12 991 5141	Cell:	
E-mail:	lukas@pachnoda.co.za	Fax:	(0) 86 578 3073
Are any further specialist studies recommended by the specialist?	YES	NO	
If YES, specify:			
If YES, is such a report(s) attached?	YES	NO	
If YES list the specialist reports attached below			

Signature of specialist:



Date:

20/07/18

Please note; If more than one specialist was consulted to assist with the filling in of this section then this table must be appropriately duplicated

8. Land use character of surrounding area


Using the associated number of the relevant current land use or prominent feature from the table below, fill in the position of these land-uses in the vacant blocks below which represent a 500m radius around the site

1. Vacant land	2. River, stream, wetland	3. Nature conservation area	4. Public open space	5. Koppie or ridge
6. Dam or reservoir	7. Agriculture	8. Low density residential	9. Medium to high density residential	10. Informal residential
11. Old age home	12. Retail	13. Offices	14. Commercial & warehousing	15. Light industrial
16. Heavy industrial ^{AN}	17. Hospitality facility	18. Church	19. Education facilities	20. Sport facilities



21. Golf course/polo fields	22. Airport ^N	23. Train station or shunting yard ^N	24. Railway line ^N	25. Major road (4 lanes or more) ^N
26. Sewage treatment plant^A	27. Landfill or waste treatment site ^A	28. Historical building	29. Graveyard	30. Archeological site
31. Open cast mine	32. Underground mine	33. Spoil heap or slimes dam ^A	34. Small Holdings	
Other land uses (describe):				

NOTE: Each block represents an area of 250m X 250m, if your proposed development is larger than this please use the appropriate number and orientation of hashed blocks

	1	1	1	1	1	
	14	1	1	1	1	
WEST	14	1		1	1	EAST
	1	1	26/2	2	2	
	1	1	2	2	2	
			SOUTH			

Note: More than one (1) Land-use may be indicated in a block

= Site

Please note: The Department may request specialist input/studies depending on the nature of the land use character of the area and potential impact(s) of the proposed activity/ies. Specialist reports that look at health & air quality and noise impacts may be required for any feature above and in particular those features marked with an “A” and with an “N” respectively.

Have specialist reports been attached
If yes indicate the type of reports below

	NO
--	----

9. Socio-economic context

Describe the existing social and economic characteristics of the area and the community condition as baseline information to assess the potential social, economic and community impacts.

The following information was sourced from the 2007 Environmental Management Framework for the City of Ekurhuleni and the Integrated Development Plan (“IDP”) for City of Ekurhuleni 2017/18 to 2020/21.

Population Trends

The 2016 Community Survey shows that the City of Ekurhuleni has an estimated population of 3 379 104, an increase by 200 634 people from 3 178 470 in the 2011 census. The population growth rate as declined from 4% in 1996 and 2001 to 2.47% between 2001 and 2013. The population growth of in the City of Ekurhuleni is attributed to the net migration into the City, as together with Tshwane and Johannesburg, are the largest recipients of in-migration in the country. The population of the City of Ekurhuleni is rooted and typical of the



South African population in general.

As shown in the figure below, the city is undergoing a demographic transition at the base of the pyramid driven largely by declining fertility, that is observable for the whole of South Africa. Furthermore, the effect of in-migration of typically the 25 - 64-year-old people due to the search for economic opportunities within the city.

Education

According to the IDP, the level of education within the City of Ekurhuleni is improving as the number of people without any schooling decreased from 2005 to 2015 with an average annual rate of -4.83%, while the number of people within the 'matric only' category, increased from 538,000 to 818,000. The overall level of people with 'matric' or higher education shows progress, as the number of people with 'matric and a certificate/diploma' increased with an average annual rate of 4.82%, with the number of people with a 'matric and a Bachelor's' degree increasing with an average annual rate of 6.33%.

Economic Analysis:

The structure of the City of Ekurhuleni's economy is dominated by four sectors: manufacturing, finance and business services, community services and general government and to a lesser extent the trade and hospitality sector. Over the past 15 years, major structural shifts have occurred in the structure of the economy principally involving the decline of the dominance of the manufacturing sector that dropped from 30.3% in 2000 to 22.7% in 2015 and a comparable increase of the contribution of the finance and business services sector that increased its share from 14.8% in 2011 to 21.3% in 2015.

The continuing decline of the manufacturing sector is a big challenge for the municipality and for that reason the revitalization of the manufacturing sector is a key strategic focus area for the municipality.

Employment:

In 2015, the City of Ekurhuleni employed 1.19 million people which is 23.92% of the total employment in Gauteng (4.96 million), 7.71% of total employment in South Africa (15.4 million). Employment within the City of Ekurhuleni increased annually at an average rate of 2.54% from 2005 to 2015. The City of Ekurhuleni's average annual employment growth rate of 2.54% exceeds the average annual labour force growth rate of 2.33%.

The socio-economic context of the proposed pipeline route (Section 1) is characterised by the existing Serengeti pump station that will form part of the proposed upgrading activities, and the Astral food operations located to the west of the proposed pipeline route. The proposed project involves the improvement of sanitation services by increasing the capacity of the existing infrastructure and accommodating anticipated flows as a result of future development in the area. The proposed development will support future development trends as improved infrastructural services is essential for economic growth.

10. Cultural/historical features

Please be advised that if section 38 of the National Heritage Resources Act 25 of 1999 is applicable to your proposal or alternatives, then you are requested to furnish this Department with written comment from the South African Heritage Resource Agency (SAHRA) – Attach comment in appropriate annexure

38. (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as-

- (a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- (b) the construction of a bridge or similar structure exceeding 50m in length;
- (c) any development or other activity which will change the character of a site-



- (i) exceeding 5 000 m2 in extent; or
- (ii) involving three or more existing erven or subdivisions thereof; or
- (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
- (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
- (d) the re-zoning of a site exceeding 10 000 m2 in extent; or
- (e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

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

YES	NO
-----	----

If YES, explain:

If uncertain, the Department may request that specialist input be provided to establish whether there is such a feature(s) present on or close to the site.

Briefly explain the findings of the specialist if one was already appointed:

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

YES	NO
YES	NO

Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?

If yes, please attached the comments from SAHRA in the appropriate Appendix

Section 2: R25 to existing Hartbeesfontein/ERWAT (Point 3-10)

Note: Complete Section B for the proposal and alternative(s) (if necessary)

Instructions for completion of Section B for linear activities

- 1) For linear activities (pipelines etc.) it may be necessary to complete Section B for each section of the site that has a significantly different environment.
- 2) Indicate on a plan(s) the different environments identified
- 3) Complete Section B for each of the above areas identified
- 4) Attach to this form in a chronological order
- 5) Each copy of Section B must clearly indicate the corresponding sections of the route at the top of the next page.

Section B has been duplicated for sections of the route

X 2

Instructions for completion of Section B for location/route alternatives

- 1) For each location/route alternative identified the entire Section B needs to be completed
- 2) Each alternative location/route needs to be clearly indicated at the top of the next page
- 3) Attach the above documents in a chronological order

Section B has been duplicated for location/route alternatives
(complete only when appropriate)

 times

Instructions for completion of Section B when both location/route alternatives and linear activities are applicable for the application



Section B is to be completed and attachments order in the following way

- All significantly different environments identified for Alternative 1 is to be completed and attached in a chronological order; then
- All significantly different environments identified for Alternative 2 is to be completed and attached chronological order, etc.

Section B - Section of Route (complete only when appropriate for above)

Section B – Location/route Alternative No. (complete only when appropriate for above)

1. Property description

Property description: (Including Physical Address and Farm name, portion etc.).

Section 2 (points 3-10) is the remaining section of the proposed rising main. Section 2 of the proposed rising main is approximately 1266 m and is located outside of the urban area of Kempton Park (east of the R21). The surrounding land use is that of the existing informal access roads, the Hartebeesfontein office park and the ERWAT WWTW.

Section 2(Points 3-10) affects the following properties:

- Remaining Extent 6 of the farm Hartbeesfontein 171R.
- Remaining Extent 7 of the farm Hartbeesfontein 171R.
- Remaining Extent of Portion 5 of the farm Witfontein 161R.

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

Alternative:

Latitude (S):

Longitude (E):

In the case of linear activities:

Alternative:

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

	Latitude (S):	Longitude (E):
Point 3	26° 1'24.94" S	28°17'28.30" E
Point 7	26° 1'28.325" S	28°17'4.79" E
Point 10	26° 1'14.474" S	28°16'56.681" E

For route alternatives that are longer than 500m, please provide co-ordinates taken every 250 meters along the route and attached in the appropriate Appendix

Addendum of route alternatives attached

The 21-digit Surveyor General code of each cadastral land parcel



PROPOSAL (SECTION 1)																				
Portion 7 of the farm Hartbeesfontein 17IR	T	0	I	R	0	0	0	0	0	0	0	0	0	0	1	7	0	0	0	0
Portion 6 of the farm Hartbeesfontein 17IR	T	0	I	R	0	0	0	0	0	0	0	0	0	0	1	7	0	0	0	0
Portion 5 of the farm Witfontein 16IR	T	0	I	R	0	0	0	0	0	0	0	0	0	0	1	6	0	0	0	0

3. Gradient of the site

Indicate the general gradient of the site.

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
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4. Location in landscape

Indicate the landform(s) that best describes the site.

Ridgeline	Plateau	Side slope of hill/ridge	Valley	Plain	Undulating plain/low hills	River front
-----------	---------	--------------------------	--------	-------	-----------------------------------	-------------

5. Groundwater, soil and geological stability of the site

a) Is the site located on any of the following?

Shallow water table (less than 1.5m deep)

Dolomite, sinkhole or doline areas

Seasonally wet soils (often close to water bodies)

Unstable rocky slopes or steep slopes with loose soil

Dispersive soils (soils that dissolve in water)

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

Any other unstable soil or geological feature

An area sensitive to erosion

YES	NO
YES	NO
YES	NO
YES	NO
YES	NO
YES	NO
YES	NO
YES	NO

(Information in respect of the above will often be available at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by Geological Survey may also be used).

b) are any caves located on the site(s)

	NO
--	-----------

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

Latitude (S):

Longitude (E):

--	--

c) are any caves located within a 300m radius of the site(s)

	NO
--	-----------

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

Latitude (S):

Longitude (E):

--	--

d) are any sinkholes located within a 300m radius of the site(s)

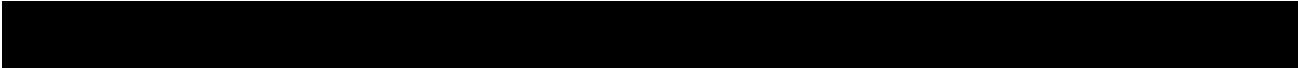
	NO
--	-----------

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)



Latitude (S):

Longitude (E):



If any of the answers to the above are "YES" or "unsure", specialist input may be requested by the Department

6. Agriculture

Does the site have high potential agriculture as contemplated in the Gauteng Agricultural Potential Atlas (GAPA 4)?

YES	NO
-----	----

Please note: The Department may request specialist input/studies in respect of the above.

7. Groundcover

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

Indicate the types of groundcover present on the site and include the estimated percentage found on site.

Natural veld - good condition % = 0	Natural veld with scattered aliens % = 5	Natural veld with heavy alien infestation % = 0	Veld dominated by alien species % = 0	Landscaped (vegetation) % = 10
Sport field % = 0	Cultivated land % = 0	Paved surface (hard landscaping) % = 50	Building or other structure % = 5	Bare soil % = 30

Please note: The Department may request specialist input/studies depending on the nature of the groundcover and potential impact(s) of the proposed activity/ies.

Wetland specialist input section 1: Points 3-10

Are there any rare or endangered flora or fauna species (including red list species) present on the site?

YES	NO
-----	----

If YES, specify and explain:



Are there any rare or endangered flora or fauna species (including red list species) present within a 200m (if within urban area as defined in the Regulations) or within 600m (if outside the urban area as defined in the Regulations) radius of the site.

YES	NO
-----	----

If YES, specify and explain:



Are there any special or sensitive habitats or other natural features present on the site?

YES	NO
-----	----

If YES, specify and explain:



Was a specialist consulted to assist with completing this section

YES	NO
-----	----


If yes complete specialist details

Name of the specialist:

C. du Preez- Scientific Aquatic Services CC (SAS)
--



Qualification(s) of the specialist:	MSc Environmental Sciences (North West University) BSc (Hons) Environmental Sciences (North West University) BSc Environmental and Biological Sciences (North West University)		
Postal address:	PO Box 751779 Garden view		
Postal code:	2047		
Telephone:	011 616 7893	Cell:	
E-mail:	admin@sasenvironmental.co.za	Fax:	086 724 3132
Are any further specialist studies recommended by the specialist?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If YES, specify:	[Redacted]		
If YES, is such a report(s) attached?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If YES list the specialist reports attached below	[Redacted]		

Signature of specialist:  Date: **23/07/18**

Please note; If more than one specialist was consulted to assist with the filling in of this section then this table must be appropriately duplicated

Fauna & flora specialist input Section 2: Point 3-10

Are there any rare or endangered flora or fauna species (including red list species) present on the site	<input type="checkbox"/>	<input type="checkbox"/>
--	--------------------------	--------------------------

If YES, specify and explain:

Are there any rare or endangered flora or fauna species (including red list species) present within a 200m (if within urban area as defined in the Regulations) or within 600m (if outside the urban area as defined in the Regulations) radius of the site.	<input type="checkbox"/>	<input type="checkbox"/>
--	--------------------------	--------------------------

If YES, specify and explain:

Are there any special or sensitive habitats or other natural features present on the site?	<input type="checkbox"/>	<input type="checkbox"/>
--	--------------------------	--------------------------

If YES, specify and explain:

Was a specialist consulted to assist with completing this section	<input type="checkbox"/>	<input type="checkbox"/>
---	--------------------------	--------------------------

If yes complete specialist details

Name of the specialist:	C. du Preez- Scientific Aquatic Services CC (SAS)		
Qualification(s) of the specialist:	MSc Environmental Sciences (North West University) BSc (Hons) Environmental Sciences (North West University) BSc Environmental and Biological Sciences (North West University)		
Postal address:	PO Box 751779 Garden view		
Postal code:	2047		
Telephone:	011 616 7893	Cell:	
E-mail:	admin@sasenvironmental.co.za	/Fax:	086 724 3132
Are any further specialist studies recommended by the specialist?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



If YES,
specify:

--

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

YES

NO

If YES list the specialist reports attached below



Signature of specialist:

Stalen

Date:

23/07/18

Please note; If more than one specialist was consulted to assist with the filling in of this section then this table must be appropriately duplicated

8. Land use character of surrounding area

Using the associated number of the relevant current land use or prominent feature from the table below, fill in the position of these land-uses in the vacant blocks below which represent a 500m radius around the site

1. Vacant land	2. River, stream, wetland	3. Nature conservation area	4. Public open space	5. Koppie or ridge
6. Dam reservoir or	7. Agriculture	8. Low density residential	9. Medium to high density residential	10. Informal residential
11. Old age home	12. Retail	13. Offices	14. Commercial & warehousing	15. Light industrial
16. Heavy industrial ^{AN}	17. Hospitality facility	18. Church	19. Education facilities	20. Sport facilities
21. Golf course/polo fields	22. Airport ^N	23. Train station or shunting yard ^N	24. Railway line ^N	25. Major road (4 lanes or more) ^N
26. Sewage treatment plant^A	27. Landfill or waste treatment site ^A	28. Historical building	29. Graveyard	30. Archaeological site
31. Open cast mine	32. Underground mine	33. Spoil heap or slimes dam ^A	34. Small Holdings	
35. Other land uses (describe):				



NOTE: Each block represents an area of 250m X 250m, if your proposed development is larger than this please use the appropriate number and orientation of hashed blocks

	1	26	26	26	1	
	1	1	1	13	1	
WEST	1	1		1	1	EAST
	1	1	1	1	1	
	1	14	1	26	2	
						SOUTH

Note: More than one (1) Land-use may be indicated in a block

= Site

Please note: The Department may request specialist input/studies depending on the nature of the land use character of the area and potential impact(s) of the proposed activity/ies. Specialist reports that look at health & air quality and noise impacts may be required for any feature above and in particular those features marked with an "A" and with an "N" respectively.

Have specialist reports been attached
If yes indicate the type of reports below

NO

9. Socio-economic context

Describe the existing social and economic characteristics of the area and the community condition as baseline information to assess the potential social, economic and community impacts.

The following information was sourced from the 2007 Environmental Management Framework for Ekurhuleni and the Integrated Development Plan ("IDP") for City of Ekurhuleni 2017/18 to 2020/21.

Population Trends

The 2016 Community Survey shows that the City of Ekurhuleni has an estimated population of 3 379 104, an increase by 200 634 people from 3 178 470 in the 2011 census. The population growth rate as declined from 4% in 1996 and 2001 to 2.47% between 2001 and 2013. The population growth in the City of Ekurhuleni is attributed to the net migration into the City, as together with Tshwane and Johannesburg, are the largest recipients of in-migration in the country. The population of Ekurhuleni is rooted and typical of the South African population in general. As shown in the figure below, the city is undergoing a demographic transition at the base of the pyramid driven largely by declining fertility, that is observed for the whole of South Africa. Furthermore, the effect of in-migration of typically the 25 - 64-year-old people due to the search for economic opportunities within the city.

Education

According to the IDP, the level of education within the City of Ekurhuleni is improving as the number of people without any schooling decreased from 2005 to 2015 with an average annual rate of -4.83%, while the number of people within the 'matric only' category, increased from 538,000 to 818,000. The overall level of people with 'matric' or higher education shows progress, as the number of people with 'matric and a certificate/diploma' increased with an average annual rate of 4.82%, with the number of people with a 'matric and a Bachelor's' degree increasing with an average annual rate of 6.33%.

Economic Analysis:

The structure of the City of Ekurhuleni's economy is dominated by four sectors: manufacturing, finance and business services, community services and general government and to a lesser extent the trade and hospitality sector. Over the past 15 years, major structural shifts have occurred in the structure of the economy principally involving the decline of the dominance of the manufacturing sector that dropped from 30.3% in 2000 to 22.7% in 2015 and a comparable increase of the contribution of the finance and business services sector that increased its share from 14.8% in 2011 to 21.3% in 2015. The continuing decline of the manufacturing sector is a big challenge for the municipality and for that reason the revitalization of the manufacturing sector is a key strategic focus area for the municipality.

Employment:

In 2015, the City of Ekurhuleni employed 1.19 million people which is 23.92% of the total employment in Gauteng (4.96 million), 7.71% of total employment in South Africa (15.4 million). Employment within the City of Ekurhuleni increased annually at an average rate of 2.54% from 2005 to 2015. The City of Ekurhuleni's average annual employment growth rate of 2.54% exceeds the average annual labour force growth rate of 2.33%.

The socio-economic context of the proposed pipeline route associated with Section 12 is characterised by the ERWAT offices and the ERWAT WWTW as the proposed sewer line ties into the existing connection at ERWAT. The Astral food operations is found to the south of the R25 as well as the existing Serengeti WWTW. The area has been identified as a future urban development area as per the National Spatial Development Framework-region B. The proposed development will support future development trends as improved infrastructural services is essential for economic growth.

10. Cultural/Historical Features

Please be advised that if section 38 of the National Heritage Resources Act 25 of 1999 is applicable to your proposal or alternatives, then you are requested to furnish this Department with written comment from the South African Heritage Resource Agency (SAHRA) – Attach comment in appropriate annexure

38. (1) *Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as-*

- (a) *the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;*
- (b) *the construction of a bridge or similar structure exceeding 50m in length;*
- (c) *any development or other activity which will change the character of a site-*
 - (i) *exceeding 5 000 m2 in extent; or*
 - (ii) *involving three or more existing erven or subdivisions thereof; or*
 - (iii) *involving three or more erven or divisions thereof which have been consolidated within the past five years; or*
 - (iv) *the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;*
- (d) *the re-zoning of a site exceeding 10 000 m2 in extent; or*
- (e) *any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.*

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

YES	NO
-----	----

If YES, explain:



If uncertain, the Department may request that specialist input be provided to establish whether there is such a feature(s) present on or close to the site.

Briefly explain the findings of the specialist if one was already appointed:



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

YES	NO
-----	-----------

Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?

YES	NO
-----	-----------

If yes, please attached the comments from SAHRA in the appropriate Appendix



SECTION C: PUBLIC PARTICIPATION (SECTION 41)

The environmental assessment practitioner must conduct public participation process in accordance with the requirement of the EIA Regulations, 2014.

1. Local authority participation

Local 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 thirty (30) calendar days before the submission of the application to the competent authority.

Was the draft report submitted to the local authority for comment?

YES	NO
-----	----

This report has been provided to local authorities and key organs of state for comment as per the stakeholder database presented in Annexure E.

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

This is the draft BAR and this report will be circulated to the local authority.

If "NO" briefly explain why no comments have been received or why the report was not submitted if that is the case.

This is the draft BAR and comments will be incorporated into the final BAR.

2. Consultation with other stakeholders

Any stakeholder that has a direct interest in the activity, site or property, such as servitude holders and service providers, should be informed of the application at least **thirty (30) calendar days** before the submission of the application and be provided with the opportunity to comment.

Has any comment been received from stakeholders?

YES	NO
-----	----

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

[Redacted]

If "NO" briefly explain why no comments have been received

The draft report will still be circulated for a period of 30 days.

3. General public participation requirements

The Environmental Assessment Practitioner must ensure that the public participation process 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 and ratepayers associations. 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 flawed.



The EAP must record all comments and respond to each comment of the public / interested and affected party before the application report is submitted. The comments and responses must be captured in a Comments and Responses Report as prescribed in the regulations and be attached to this application.

4. Appendices for public participation

All public participation information is to be attached in the appropriate Appendix. The information in this Appendix is to be ordered as detailed below

Appendix 1 – Proof of site notice

Appendix 2 – Written notices issued as required in terms of the regulations

Appendix 3 – Proof of newspaper advertisements

Appendix 4 – Communications to and from interested and affected parties

Appendix 5 – Minutes of any public and/or stakeholder meetings

Appendix 6 - Comments and Responses Report

Appendix 7 –Comments from I&APs on Basic Assessment (BA) Report

Appendix 8 –Comments from I&APs on amendments to the BA Report

Appendix 9 – Copy of the register of I&Aps



SECTION D: RESOURCE USE AND PROCESS DETAILS

Note: Section D is to be completed for the proposal and alternative(s) (if necessary)

Instructions for completion of Section D for alternatives

- 1) For each alternative under investigation, where such alternatives will have different resource and process details (e.g. technology alternative), the entire Section D needs to be completed
- 2) Each alternative needs to be clearly indicated in the box below
- 3) Attach the above documents in a chronological order

Section D has been duplicated for alternatives
(complete only when appropriate)

"insert No. of duplicates"

X0 times

This section has not been duplicated as the sections of pipeline from 1-13 are deemed the same.

Section D Alternative No.

0

(complete only when appropriate for above)

1. Waste, effluent, and emission management

Solid waste management

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

YES

NO

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

4 m³

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

There will be no large quantities of solid waste produced during the construction phase of the proposed activity. Construction waste that cannot be reused will be collected at the construction camp and on site with skips and bins, and all construction waste will be transported to a registered landfill site. Excavated material that is not suitable to be backfilled into the excavations will be evenly spread across the adjacent environment. Material that cannot be re-used will be disposed of at a registered landfill site.

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

The construction waste will be disposed of at a suitably licensed/ registered disposal facility. During construction wastes must be separated at source and disposed at a registered/licensed facility. Waste should be separated into recyclable and non-recyclable materials and distributed for recycling where applicable. To ensure optimal material reuse, construction waste will be used as fill material and as foundation for the proposed processes where possible. In such a case, re-use of construction waste materials will minimise the amount of waste that will need to be disposed of at registered municipal waste facilities. Only inert, non-hazardous construction material will be re-used.

Will the activity produce solid waste during its operational phase?

YES

NO

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

m³

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

All construction waste will be collected, sorted and disposed of at suitably licensed disposal facilities. No solid waste will be produced during the operational phase.

Has the municipality or relevant service provider confirmed that sufficient air space exists for treating/disposing of the solid waste to be generated by this activity?

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



Trenches will be excavated for the laying of the proposed sewer pipeline. The excavated material, if suitable, will be used as backfill. All construction waste will be collected, sorted and disposed of at suitably licensed disposal facilities.

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

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

Waste management will follow the hierarchy of reduce, reuse and recycle. This will be implemented on site during construction, as a condition of the EMP. Waste that cannot be immediately reused or recycled during the construction phase will be removed and taken to a temporary waste storage area located within the construction camp. It will then be separated into appropriately marked receptacles.

Liquid effluent (other than domestic sewage)

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

YES	NO
-----	-----------

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

m³

If yes, has the municipality confirmed that sufficient capacity exist for treating / disposing of the liquid effluent to be generated by this activity(ies)?

YES	NO
-----	----

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

YES	NO
-----	-----------

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

m³

If yes describe the nature of the effluent and how it will be disposed.



Note that if effluent is to be treated or disposed on site 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
------------	----

If yes, provide the particulars of the facility:

Facility name:

The proposed activity will not involve the disposal of effluent ,the proposed project is for the construction of sewage infrastructure and the activity will involve the transportation of sewage from the Serengeti Pump Station to the ERWAT(Hartebeesfontein) WWTW as well as the upgrading of the Serengeti pump station.	
--	--

Contact person:

--	--

Postal address:

--	--

Postal code:

--	--

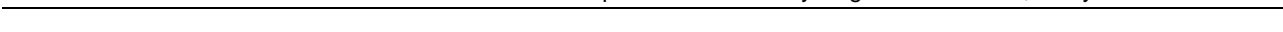
Telephone:

	Cell: <table border="1"><tr><td> </td></tr></table>	

E-mail:

	Fax: <table border="1"><tr><td> </td></tr></table>	

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



No waste water will be produced in the proposed activity.

Liquid effluent (domestic sewage)

Will the activity produce domestic effluent that will be disposed of in a municipal sewage system?

YES	NO
-----	----

If yes, what estimated quantity will be produced per month? **5 liters of domestic sewerage per person x 100 construction workers x 21 days.**

10.5 m ³	
---------------------	--

If yes, has the municipality confirmed that sufficient capacity exists for treating / disposing of the domestic effluent to be generated by this activity(ies)?

YES	NO
-----	----

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

YES	NO
-----	----

If yes describe how it will be treated and disposed of.

--

Emissions into the atmosphere

Will the activity release emissions into the atmosphere?

YES	NO
-----	----

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

YES	NO
-----	----

If yes, 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:

During the construction phase, dust and vehicular emissions will be released resulting from the earth moving machinery and trucks transporting construction material. However, the emissions will have a short-term impact to the immediate surrounding areas that can be easily mitigated. Therefore, authorisation of such emissions will not be required.

2. Water use

Indicate the source(s) of water that will be used for the activity

Municipal	Directly from water board	groundwater	river, stream, dam or lake	other	the activity will not use water
------------------	---------------------------	-------------	----------------------------	-------	---------------------------------

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:

liters

If Yes, please attach proof of assurance of water supply, e.g. yield of borehole, in the appropriate Appendix

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

YES	NO
-----	----

If yes, list the permits required

The proposed upgrading of the existing Serengeti Pump station and sections of the proposed rising main will trigger a Water Use License in terms of Section 21 of NWA. Authority consultation with the Department of Water and Sanitation has been initiated to discuss the requirements of the application and a water use license application will be submitted to DWS.

If yes, have you applied for the water use permit(s)?

YES	NO
-----	----

If yes, have you received approval(s)? (attached in appropriate appendix)

YES	NO
-----	----

3. Power supply

Please indicate the source of power supply eg. Municipality / Eskom / Renewable energy source



Electricity will be supplied by Eskom.

If power supply is not available, where will power be sourced from?

Use of generators.

4. Energy efficiency

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

Not applicable.

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

Due to insignificant use of energy this was not considered.



SECTION E: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2014, 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 as well as the impacts of not implementing the activity (Section 24(4)(b)(i)).

1. Issues raised by interested and affected parties

Summarise the issues raised by interested and affected parties.

As this is the draft BAR, no issues have been brought to the attention of the EAP.

Summary of response from the practitioner to the issues raised by the interested and affected parties (including the manner in which the public comments are incorporated or why they were not included)

(A full response must be provided in the Comments and Response Report that must be attached to this report):

All responses will be included in the final BAR when comments are received.

2. Impacts that may result from the construction and operational phase

Briefly describe the methodology utilised in the rating of significance of impacts

The environmental risk of any aspect is determined by a combination of parameters associated with the impact. Each parameter connects the physical characteristics of an impact to a quantifiable value to rate the environmental risk.

Impact assessments should be conducted based on a methodology that includes the following:

- **Clear processes for impact identification, predication and evaluation;**
- **Specification of the impact identification techniques;**
- **Criteria to evaluate the significance of impacts;**
- **Design of mitigation measures to lessen impacts;**
- **Definition of the different types of impacts (indirect, direct or cumulative); and**
- **Specification of uncertainties.**

In broad terms, the impact assessment for this project will include the following:

- **All potential impacts of the proposed activity will be identified and assessed;**
- **The nature, significance, consequence, extent, duration and probability of all impacts will be predicted; degree to which these impacts can be reversed, may cause irreplaceable loss of resources and can be avoided, managed or mitigated.**
- **Identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity.**
- **Identify suitable measures to avoid, manage or mitigate identified impacts,**
- **Identify residual risks that need to be managed and monitored.**

The construction, operational and decommissioning phases of the project will be considered whilst identifying impacts. A detailed understanding of the proposed activity will be obtained to ensure that all the potential impacts are identified. The following process will be followed to identify and assess the potential impacts of the proposed activity:

- **The current environmental conditions will be determined in detail. This will act as a baseline against which impacts can be identified and measured;**
- **The changes that will occur in future, should the proposed activity not occur, will be identified;**



- A detailed understanding of the activity will be obtained to fully understand its consequences; and
- The significant impacts that will occur as a result of the proposed activity will be identified (should the activity be authorised).

After all impacts have been identified, the nature of each impact can be predicted. The impact prediction will take into account physical, biological, socio-economic and cultural information and will then estimate the likely parameters and characteristics of the impacts. The impact prediction will aim to provide a basis from which the significance of each impact can be determined, and appropriate mitigation measures can be developed.



Table 1 and Table 2 below indicate the methodology to be used in order to assess the Probability and Magnitude of the impact, respectively, and Table 3 provides the Risk Matrix that will be used to plot the Probability against the Magnitude in order to determine the Severity of the impact.

Table 1: Determination of Probability of Impact

Frequency of Aspect / Unwanted Event	Score	Availability of pathway from the source to the receptor.	Score	Availability of receptor.	Score
Never known to have happened but may happen.	1	A pathway to allow for the impact to occur is never available.	1	The receptor is never available.	1
Known to happen in industry.	2	A pathway to allow for the impact to occur is almost never available.	2	The receptor is almost never available.	2
< once a year.	3	A pathway to allow for the impact to occur is sometimes available.	3	The receptor is sometimes available.	3
Once per year to up to once per month.	4	A pathway to allow for the impact to occur is almost always available.	4	The receptor is almost always available.	4
Once a month – Continuous.	5	A pathway to allow for the impact to occur is always available.	5	The receptor is always available.	5

Step 1: Determine the PROBABILITY of the impact by calculating the average between the Frequency of the Aspect, the Availability of a pathway to the receptor and the availability of the receptor.



Table 2: Determination of Magnitude of Impact

SOURCE						RECEPTOR					
Duration of impact	Score	Extent	Score	Volume / Quantity / Intensity	Score	Toxicity / Destruction Effect	Score	Reversibility	Score	Sensitivity of environmental component	Score
Lasting days to a month	1	Effect limited to the site. (metres);	1	Very small quantities / volumes / intensity (e.g. < 50L or < 1Ha)	1	Non-toxic (e.g. water) / Very low potential to create damage or destruction to the environment	1	Bio-physical and/or social functions and/or processes will remain unaltered.	1	Current environmental component(s) are largely disturbed from the natural state. Receptor of low significance / sensitivity	1
Lasting 1 month to 1 year	2	Effect limited to the activity and its immediate surroundings. (tens of metres)	2	Small quantities / volumes / intensity (e.g. 50L to 210L or 1Ha to 5Ha)	2	Slightly toxic / Harmful (e.g. diluted brine) / Low potential to create damage or destruction to the environment	2	Bio-physical and/or social functions and/or processes might be negligibly altered or enhanced / Still reversible	2	Current environmental component(s) are moderately disturbed from the natural state. No environmentally sensitive components.	2
Lasting 1 – 5 years	3	Impacts on extended area beyond site boundary (hundreds of metres)	3	Moderate quantities / volumes / intensity (e.g. > 210 L < 5000L or 5 – 8Ha)	3	Moderately toxic (e.g. slimes) Potential to create damage or destruction to the environment	3	Bio-physical and/or social functions and/or processes might be notably altered or enhanced / Partially reversible	3	Current environmental component(s) are a mix of disturbed and undisturbed areas. Area with some environmental sensitivity (scarce / valuable environment etc.).	3
Lasting 5 years to Life of Organisation	4	Impact on local scale / adjacent sites (km's)	4	Very large quantities / volumes / intensity (e.g. 5000 L – 10 000L or 8Ha– 12Ha)	4	Toxic (e.g. diesel & Sodium Hydroxide)	4	Bio-physical and/or social functions and/or processes might be considerably altered or enhanced / potentially irreversible	4	Current environmental component(s) are in a natural state. Environmentally sensitive environment / receptor (endangered species / habitats etc.).	4
Beyond life of Organisation / Permanent impacts	5	Extends widely (nationally or globally)	5	Very large quantities / volumes / intensity (e.g. > 10 000 L or > 12Ha)	5	Highly toxic (e.g. arsenic or TCE)	5	Bio-physical and/or social functions and/or processes might be severely/substantially altered or enhanced / Irreversible	5	Current environmental component(s) are in a pristine natural state. Highly Sensitive area (endangered species, wetlands, protected habitats etc.)	5



Step 2: Determine the **MAGNITUDE** of the impact by calculating the average of the factors above.

Table 3: Determination of Severity of Impact

ENVIRONMENTAL IMPACT RATING / PRIORITY					
	MAGNITUDE				
PROBABILITY	1 Minor	2 Low	3 Medium	4 High	5 Major
5 Almost Certain	Low	Medium	High	High	High
4 Likely	Low	Medium	High	High	High
3 Possible	Low	Medium	Medium	High	High
2 Unlikely	Low	Low	Medium	Medium	High
1 Rare	Low	Low	Low	Medium	Medium

Step 3: Determine the **SEVERITY** of the impact by plotting the averages that were obtained above for Probability and Magnitude in the table below.

Briefly describe and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the construction phase for the various alternatives of the proposed development. This must include an assessment of the significance of all impacts.



2.1 Proposal (preferred)

Please see below an assessment of the potential impacts that may arise from the planning, construction and operational phase of the proposed development (preferred layout).

A. Planning/pre-construction phase: Potential impacts, significance (pre- and post-mitigation) and mitigation measures.

Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
Risk of non-compliance with legal requirements of national and provincial legislation in terms of the proposed development .	Medium (Negative)	<ul style="list-style-type: none"> Ensure that all environmental legal requirements are considered in the planning phase as the proposed activity in terms of section 2 of this report: Applicable Legislation, Policy and Guidelines. Appoint an EAP to ensure that all proposed activities and associated infrastructure in all phases of the proposed development are assessed in terms of the applicability to the relevant environmental legislation and the subsequent permits/license/ authorisations that may be required. All changes in the proposed project scope must be well communicated with the EAP to reduce the risk of non-compliance with the necessary legal requirements. 	Low (Negative)	Low
Risk of incorrect site layout.	Medium (Negative)	<ul style="list-style-type: none"> Ensure efficient communication during project planning and inception meetings between all stakeholders involved in the proposed development. The development footprint area must be clearly demarcated. 	Low (Negative)	Low
Shortage of municipal service supply for the proposed construction activities.	Medium (Negative)	<ul style="list-style-type: none"> The project developer must ensure sufficient basic municipal services (Water and Electricity) are in place prior to the commencement of construction activities. This will ensure that no delays occur during construction. 	Low (Negative)	Low
Harm to the environment due to inadequate planning and design of the proposed development.	Medium (Negative)	<ul style="list-style-type: none"> Suitable specialist(s) has been appointed to identify sensitive environmental features (including fauna, flora, and Freshwater/wetland). Mitigation measures provided by the specialist will be implemented. During site preparation, topsoil and subsoil are stripped separately from each other and must be stored separately for use in the rehabilitation phase. It should be protected from wind and rain, as well as contamination from diesel, concrete or wastewater. Records of all environmental incidents must be maintained, and a copy of these records must be made available to authorities on request throughout the project execution. Posters should be displayed on site to sensitise workers to fauna in the region. During site preparation, special care must be taken during the clearing of the works area to minimise damage or disturbance of roosting and nesting sites. No access is allowed in no-go areas without the permission of the Project Manager. Contractor to develop method statements that must 	Low (Negative)	Low

Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
		<p>be approved by the Project Manager prior to construction taking place. The plan must show the following (as relevant), at a minimum:</p> <ul style="list-style-type: none"> ○ Buildings and structures; ○ Site offices; ○ Roads and access routes; ○ Gates and fences; ○ Essential services (permanent and temporary water, electricity and sewage); ○ Rubble and waste rock storage and disposal sites; ○ Solid waste storage and disposal sites; ○ Site toilets and ablutions; ○ Topsoil stockpiles; ○ Sensitive environmental features; and ○ Any other activities, facilities and structures deemed relevant. <ul style="list-style-type: none"> • Design to consider and incorporate environmental requirements. • Define and communicate roles and responsibilities for the implementation of the EMP. • Develop and implement an environmental awareness plan. • The appointment of an Environmental Control Officer (“ECO”). • Before construction commences, all the sensitive areas must be clearly demarcated with fencing or orange mesh netting. However, the barricading measures to be utilised should restrict the movement of the fauna in the area from falling into open trenches. • Records of compliance / non-compliance must be kept on site at all times and must be made available to GDARD on request. • Records of all environmental incidents must be maintained, and a copy of these records be made available to GDARD on request throughout the proposed project execution. • During site preparation, special care must be taken during the clearing of the works area where organic material must be stored separately from the topsoil. Further, the topsoil must also be stored separately from the subsoil material to ensure for the protection thereof and that it can be reused during the rehabilitation phase. • Protected plant species should be identified prior to construction activities and should be removed (with the applicable permits). These should then be used for re-vegetation during rehabilitation. • Prior to construction, fences/barricading should be used in such a manner to prevent access to adjacent grassland areas which are not part of the pipeline servitude. 		



Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
Poor communication and lack of transparency of project information that may lead to conflict.	Medium (Negative)	<ul style="list-style-type: none"> All I&APs must be identified and informed of the proposed project and included in the life cycle of the proposed project. All comments received from the public must be addressed as per the PPP process outlined in the NEMA 2014 EIA regulations. 	Low (Negative)	Low

B. Construction phase: Potential impacts, significance (pre- and post-mitigation) and mitigation measures

Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
Legislative requirements				
Non-compliance with legal requirements of the EA	Medium (Negative)	<ul style="list-style-type: none"> Ensure that all environmental legal requirements are considered in the planning phase such as the conditions outlined in the EA and other relevant permits/license. All mitigation measures outline in the EMP must be followed. Confirm that there are no changes to the original scope of works as authorised in the environmental authorisation. 	Low (Negative)	Low
Development footprint				
Risk of construction activities occurring outside the development.	Medium (Negative)	<ul style="list-style-type: none"> The boundaries of footprint areas, including contractor laydown areas are to be clearly defined and it should be ensured that all activities remain within the defined footprint areas. Edge effects must be carefully controlled. 	Low (Negative)	Low
Health and safety				
Risk of damage caused by fires on site.	Medium (Negative)	<ul style="list-style-type: none"> No fires are permitted in or near the construction area. 	Low (Negative)	Low
Health and safety risk that may arise and impact on the public and construction workers.	Medium (Negative)	<ul style="list-style-type: none"> Ensure that all signage of safety risk that may be present are clearly marked and cordoned off from the public. All activities must comply with the Occupational Health and Safety Act (No 85 of 1993). 	Low (Negative)	Low
Geology and soil				
Soil pollution due to hazardous chemical substances including fuel greases and oils used on site.	Medium (Negative)	<ul style="list-style-type: none"> Identify all hazardous chemical substances used on site, including fuel, greases and oils. Obtain the material safety data sheets for each of the hazardous chemical substances. Appropriate equipment to deal with an emergency spill incident must be 	Low (Negative)	Low



Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
		<p>readily available on site. This includes fire extinguishers, spill kits for hydrocarbon spills, drip trays for equipment and/or machinery leaks, drums or containers for contaminated water.</p> <ul style="list-style-type: none"> • Immediately clean all spillages of fuels, lubricants and other petroleum-based products. • Soil and other material contaminated with hazardous chemical substances shall be treated as hazardous waste and removed from site. 		
Exposure to soil erosion.	Medium (Negative)	<ul style="list-style-type: none"> • Contractors must ensure that all reasonable measures are taken to preserve topsoil. • During site preparation, topsoil and subsoil should be stripped separately from each other and must be stored separately for use in the rehabilitation phase. • Topsoil must be protected from wind and rain, as well as contamination from diesel, concrete or wastewater. • Contractors are to ensure that all reasonable measures are taken to limit erosion during the construction phase. • Do not allow erosion to develop to a large scale before taking action. • Existing roads and tracks should be used as far as possible. • Retain vegetation and soil in position as long as possible. It should only be removed immediately ahead of construction. • Remove only the vegetation essential for construction. No disturbance of adjoining vegetation should be allowed. • Colonisation of the disturbed areas should be monitored to ensure that vegetation cover is sufficient within one growing season. • Stockpiles can be covered with shade netting to minimise wind- and water erosion. 	Low (Negative)	Low

Fauna and flora



Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
The removal of vegetation will expose soils which may lead to soil erosion.	Medium (Negative)	<ul style="list-style-type: none"> Remove only the vegetation where essential for construction and don't allow any disturbance to adjoining natural vegetation cover. Protect all areas susceptible to erosion (stockpiled soils) and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction site. Don't allow erosion to develop on a large scale before taking action. A temporary fence or demarcation must be erected around the construction area to prevent access to sensitive environments. Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction. Once construction is complete, the temporary road should be obliterated, and the area rehabilitated. After construction, the land must be cleared of rubbish, surplus materials and equipment, and all parts of the land must be left in a condition as close as possible to that prior to construction. Rehabilitation measures provided in the EMP as per section 5.5.2 must be followed. 	Low (Negative)	Low
Spread of alien invasive plant species from the transformed areas to the natural vegetation.	Medium (Negative)	<ul style="list-style-type: none"> Alien invasive species should be removed (prioritising NEMBA category 1A & B species). All alien seedlings and saplings must be removed as they become evident. Manual/mechanical removal should be used rather than chemical control. Hazardous chemicals may impact upon natural vegetation in the area as well as the freshwater resources. All equipment and vehicles should be thoroughly cleaned prior to access the study area to prevent the spread of alien invasive vegetation 	Low (Negative)	Low
Disturbance of sensitive vegetation.	Medium (Negative)	<ul style="list-style-type: none"> Any sensitive vegetation present on site must be demarcated to avoid disturbance. If removal is required, a qualified specialist should remove and relocated the sensitive vegetation. Fences/barricading should be used in such a manner to prevent access to adjacent grassland areas which are not part of the proposed pipeline servitude. 	Low (Negative)	Low
Damage to natural habitat due to construction activities and consequential displacement of faunal species.	Medium (Negative)	<ul style="list-style-type: none"> Construction activities should be restricted to the development footprint. The site should be cordoned off to restrict the movement of construction vehicles and personnel. No development should occur within any sensitive natural open spaces. 	Low (Negative)	Low



Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
Loss of ecosystem function such as reduction in water quality, soil pollution and underground water contamination and the consequent negative impacts on faunal species.	Medium (Negative)	<ul style="list-style-type: none"> Restrict construction activities to the development site. Prevent movement of construction personnel and vehicles outside of the development footprint. No development should occur within any sensitive natural open spaces. Minimise environmental pollution by effective implementation of the prescribed mitigation measures. All monitoring measures set out in section 7 of the EMPr must be followed to reduce the risk of loss of ecosystem functioning. 	Low (Negative)	Low
Disturbance of faunal species.	Medium (Negative)	<ul style="list-style-type: none"> Education of site workers and contractors about the value of wildlife and environmental sensitivity. Site workers and contractors should ensure that no animals are disturbed, trapped, hunted or killed during the construction phase. Conservation-orientated clauses should be included into contracts for construction personnel. Outside lighting should be designated to minimise impact on fauna. All outside lighting should be directed away from sensitive areas. Fluorescent and mercury vapour lighting should be avoided. Sodium vapour or LED lights should rather be used as far as possible. 	Low (Negative)	Low
Terrestrial ecology				
Loss of terrestrial habitat, diversity and species of conservation concern, caused from site preparation and vegetation clearing.	Medium (Negative)	<ul style="list-style-type: none"> Avoid disturbance of sensitive freshwater habitat units and grassland units identified along section 1 of the proposed pipeline route. Should any species of conservation concern be encountered within the construction footprint, they are to be relocated to suitable habitat by a qualified specialist. Demarcate the construction footprint and ensure that all construction activities remain within this footprint. Ensure that the proposed development footprint area remains as small as possible, particularly within the unnamed tributary Restrict vehicles to travelling only on designated roadways to limit the ecological footprint of the proposed development. No informal fires are allowed by construction personnel outside of the development footprint. The contractor laydown and construction areas should be rehabilitated with indigenous species when construction is completed. Monitoring of these rehabilitated areas should take place a year after the construction has been completed to ensure vegetation growth. An alien vegetation monitoring programme should be developed and 	Low (Negative)	Low



Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
		<p>implemented for one year after construction activities have taken place.</p> <ul style="list-style-type: none"> All areas of disturbed and compacted soils need to be ripped, reprofiled and reseeded with indigenous vegetation to prevent the establishment of alien and invasive species. During site preparation, topsoil and subsoil should be stripped separately from each other and must be stored separately for use in the rehabilitation phase. It should be protected from wind and rain, as well as contamination from diesel, concrete or wastewater. Rehabilitation measures provided in the EMP as per section 5.5.2 must be followed. 		
Creation of access roads and the disturbance of the adjacent grasslands:	Medium (Negative)	<ul style="list-style-type: none"> Access to the proposed site must be through existing access roads, no new access roads must be constructed as part of the proposed development. No new access roads must be developed within the grassland habitat to avoid the dissecting (fragmenting) of grassland habitat by the placement of roads within grassland habitat. 	Low (Negative)	Low
Permanent to long-term loss of untransformed grassland, floristic richness and ecological condition (transformation from untransformed to secondary condition)	Medium (Negative)	<ul style="list-style-type: none"> Limit construction to access road servitude and prevent overspill of activities. An alternative route is recommended to the west of the access road corresponding to secondary grassland. 	Low (Negative)	Low
Poor waste management on site.	Medium (Negative)	<ul style="list-style-type: none"> Appropriate sanitary facilities must be provided for the life of the construction phase and all waste removed to an appropriate waste facility. Ensuring that an adequate number of waste and "spill" bins are provided will also prevent litter and ensure the proper disposal of waste and spills. 	Low (Negative)	Low
Freshwater Resources				
Risk of proposed activities occurring outside of the footprint of the existing Serengeti pump station (Located within the unnamed tributary of the Rietvlei river and associated floodplain wetland.	Medium (Negative)	<ul style="list-style-type: none"> All development footprint areas should remain as small as possible. It must be ensured that the freshwater habitat is off-limits to construction vehicles and non-essential personnel; Planning of temporary roads and access routes be restricted to existing roads where possible; If any infrastructure is to be placed in the freshwater resources, the extent of encroachment into the freshwater areas will need to be extremely well controlled and limited. All monitoring measures as per section 7 must be followed as well as monitoring upstream and downstream of the proposed activity should occur. 	Low (Negative)	Low



Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
Potential spills from the storage of hazardous goods	Medium (Negative)	<ul style="list-style-type: none"> All hazardous chemicals as well as stockpiles (especially those associated with open trenching within close proximity to freshwater resources) should be stored on bunded surfaces and have facilities constructed to control runoff from these areas; It must be ensured that all hazardous storage containers and storage areas comply with the relevant SABS standards to prevent leakage. 	Low (Negative)	Low
Potential spills and leaks from vehicles delivering construction material (during refuelling of vehicles, leaks from hazardous material containers)	Medium (Negative)	<ul style="list-style-type: none"> Should any leakages from construction vehicles or material containers occur, they should be cleaned up immediately. Refuelling of vehicles should take place on a sealed surface to prevent ingress of hydrocarbons into the soil. Construction vehicles should be restricted to designated roads only. Contractor laydown areas should be located outside the freshwater resources and the associated buffer zones (in consultation with the appropriate authority) to avoid contamination of the freshwater environment due to leakages from storage containers and vehicles. Vehicles to be serviced at the contractor laydown area, and concrete shall also be mixed in that area so much as is possible. Additional mixing of concrete may be required on site, and when this occurs, batter boards must be used, and sheeting shall be laid down to ensure concrete does not mess outside of the trenches. Footprint area should be demarcated and kept as small as possible. Chemical toilets must be serviced on a regular basis all waste must be removed and treated at a licensed waste facility. The extent of vegetation clearing should be limited for the contractor's laydown area and outside of the freshwater environment. The contractor laydown area should be rehabilitated with indigenous species when construction is completed. Monitoring of these rehabilitated areas should take place a year after the construction has 	Low (Negative)	Low
Potential spills and leaks from onsite chemical toilets.				



Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
Indiscriminate movement of vehicles within the freshwater resource.	Yellow background	<p>been completed to ensure vegetation growth.</p> <ul style="list-style-type: none"> • An alien vegetation monitoring programme should be developed and implemented for the first growing season after construction activities have taken place. • The duration of activities within the freshwater resources (especially that of the floodplain wetland) should be minimised in order to reduce the flow and functioning of the freshwater system. • The freshwater resource areas must be clearly demarcated with danger tape by an ECO and marked as a no-go area. • Excavated soils should be placed outside the freshwater resources and the associated buffer zones to limit potential sedimentation of the freshwater resources. • Soil should be covered to avoid being blown by the wind and prevent sediment runoff during rainfall events. • Soil must be recompacted to a depth of 450 mm, and all construction material must be removed from site upon the completion of construction. • The area must be rehabilitated after the completion of the construction phase. In addition, alien vegetation eradication programme must be implemented. • If stockpiled soil is to be used for rehabilitation purposes such as revegetation, all alien vegetation should be removed from soil before use, to avoid spread of alien vegetation. • Excavated soil should be used to close off the trenches, immediately after inserting the pipeline. • Flow diversion by means of scaffolding (created during the installation of the pipeline underneath the bridge structure) should be done properly to avoid inundation of the area as well as drying out of downstream areas. • The area must be rehabilitated immediately after the completion of construction activities. In addition, excavated soils can be used to level the area as well as revegetating the area. • No disposal of waste should take place within the freshwater resources or its buffer zones. 	Green background	
Clearing of vegetation during site preparations, and creating contractor laydown areas.				
Topsoil stockpiling adjacent to the freshwater resources.				



Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
Potential indiscriminate waste disposal (disposal of waste material such as soil, rocks, concrete chemicals and litter within the freshwater resources)		<ul style="list-style-type: none"> All construction rubble should be removed from the wetlands. Waste disposal bins must be provided for the duration of the construction phase. Waste bins must be emptied regularly, and the waste must be removed to a suitable waste disposal facility. Sanitation services must be provided for construction personnel, whereby at least one portable toilet will be provided per ten personnel and will be emptied regularly. Construction personnel must be informed that no firewood is to be harvested, all litter must be stored immediately and only in closed dustbins, including cigarette ends, and no litter is to remain behind on site following completion of construction activities. 		
Department of Water and Sanitation Risk Assessment				
<u>Site clearing prior to commencement of construction activities:</u> Exposure of soils, leading to increased runoff and erosion, and thus increased sedimentation of the freshwater resources. Increased sedimentation of freshwater resources, leading to smothering of biota and potentially altering surface water quality. Decreased ecoservice provision.	Low (Negative)	<ul style="list-style-type: none"> Contractor laydown areas and stockpiles to be established outside of the delineated freshwater resources zone and the applicable buffer zones in consultation with the appropriate authority. Vehicles to be serviced at the contractor laydown area, and concrete shall also be mixed in that area so much as is possible. Concrete may require additional mixing on site, and when this occurs batter boards must be used, and sheeting shall be laid down to ensure concrete does not mess outside of the trenches. The freshwater areas must be clearly demarcated with danger tape by an ECO and marked as a no-go area. During trenching no stockpiling of soils is to take place within the freshwater resources. All exposed soils must be protected for the duration of the construction phase with a suitable geotextile (e.g. Geojute or hessian sheeting) in order to prevent erosion and sedimentation of the freshwater resources. All manholes should be raised above the 1:100-year flood line as specified in the Aquatic Assessment by SAS dated August 2017. Soil must be recompacted to a depth of 450 mm, and all construction material must be removed from site upon the completion of construction in the Aquatic Assessment by SAS dated August 2017. Sanitation services must be provided for construction personnel, whereby at least one portable toilet will be provided per ten personnel and will be emptied regularly Construction personnel must be informed that no firewood is to be 	Low (Negative)	Low
<u>Ground-breaking, excavation of trench as part of the proposed upgrading of the existing Serengeti pump station and installation of the proposed rising main (within the unnamed tributary of the Rietvlei River):</u> Disturbances of soils leading to increased alien vegetation proliferation, and in turn to further altered freshwater habitat. Altered runoff patterns, leading to increased erosion and sedimentation of freshwater habitat.	Low (Negative)		Low (Negative)	Low
Potential indiscriminate waste disposal:	Low		Low	Low



Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
Altered flow regime as a result of solid wastes within the freshwater resources Altered water quality due to chemical waste disposal	(Negative)	harvested, all litter must be stored immediately and only in closed dustbins, including cigarette ends, and no litter is to remain behind on site following completion of construction activities.	(Negative)	
<u>Potential spillage from construction vehicles:</u> Possible contamination of freshwater soils and surface water, leading to reduced ability to support biodiversity.	Low (Negative)		Low (Negative)	Low
Groundwater				
Groundwater pollution due to unsanitary conditions on site.	Medium (Negative)	<ul style="list-style-type: none"> • Sufficient ablution facilities shall be provided – 1 toilet per 10 workers. • Ablution facilities should be on impermeable surfaces and at least 50 m from wetlands, drainage lines or places where storm water may accumulate. • The location of the ablution facilities is to be approved by the ECO prior to site establishment but shall be located within 100 m of any work point. • Ablating anywhere other than in toilets shall not be allowed. • Ablution facilities are to be secured. • The contractor shall ensure that no chemical and/or waste form the ablution facilities are spilled on the ground at any time. • Ablution facilities should be serviced weekly or more frequently if required. • Contents are to be removed from site on a regular basis. • Ablution facilities should be inspected and maintained to prevent and minimise blockages and leakages. • Records of sewage disposal and maintenance shall be maintained and kept on file • Toilets should have properly closing doors and be supplied with toilet paper. • Awareness of the importance of proper hygiene should be created among employees. 	Low (Negative)	Low
Groundwater pollution due to poor management and accidental spills of hazardous chemical substances including fuel, greases and oils used on site.	Medium (Negative)	<ul style="list-style-type: none"> • Identify all hazardous chemical substances used on site including fuel, greases and oils. • Obtain the material safety data sheets for each of the hazardous chemical substances. • Ensure that the material safety data sheets have sufficient information 	Low (Negative)	Low



Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
		<p>to enable the user to take the necessary measures to protect his/her health and safety and that of the environment.</p> <ul style="list-style-type: none"> Material safety data sheets for all hazardous chemical substances must be readily available on site. Appropriate equipment to deal with emergency spill incidents is to be readily available on site. This includes fire extinguishers, spill kits for hydrocarbon spills, drip trays for equipment and/or machinery leaks, drums or containers for contaminated water. Soil contaminated with hazardous chemical substances shall be treated as hazardous waste and removed from site for safe disposal (records of such shall be maintained). During refuelling, the ground must be protected, and proper dispensing equipment is to be used. All liquid fuels are to be stored in tanks and containers with lids on an impermeable surface in a bunded area. Generators must be stored on concrete floors in bunded areas. 		
Storm water management				
Surface runoff and associated sedimentation as a result of construction activities.	Medium (Negative)	<ul style="list-style-type: none"> Sheet runoff from access roads should be slowed down by the strategic placement of berms. As far as possible, all construction activities should occur in the low flow season, during the drier winter months. Appropriate storm water management features should be installed along the perimeter of the access road and the pipeline trench to prevent excessive run-off of storm water (and potential erosion) into the surrounding grassland habitat (this could result in compositional floristic changes). 	Low (Negative)	Low
Atmosphere and noise				
Ambient noise levels are likely to increase because of the construction activities.	Medium (Negative)	<ul style="list-style-type: none"> Noise generating activities must be conducted during daytime hours. Vehicles and equipment must be inspected and maintained on a regular basis. Working hours should be restricted to daylight hours. No sound amplification equipment such as sirens, loud halers or hooters are to be used on site except in emergencies. A complaints register should be kept on site. The register must record the following: Date when complaint was received, name of person who reported the complaint, details of the complaint and when and how the concern was addressed. 	Low (Negative)	Low
Degradation of ambient air quality due to dust and exhaust	Medium	<ul style="list-style-type: none"> A water cart should be kept on site to water down dusty construction 	Low	Low



Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
emission generation.	(Negative)	<p>activities.</p> <ul style="list-style-type: none"> A complaints register should be kept on site. The register must record the following: Date when complaint was received, name of person who reported the complaint, details of the complaint and when and how the concern was addressed. Open areas should be re-vegetated. Regular maintenance of vehicles and equipment should be undertaken. Optimal engine combustion will allow for "cleaner" exhaust emissions. 	(Negative)	
Heritage and Palaeontology				
Construction activities may disturb or destroy sites, features or artefacts of archaeological and/or historical importance.	Low (Negative)	<ul style="list-style-type: none"> If during any construction activities, any sites, features or objects of cultural heritage (archaeological or historical) nature are exposed, a qualified specialist should be contacted to investigate, and suitable mitigation measures must be implemented. All activities in the area should be stopped until the situation has been resolved 	Low (Negative)	Low
Construction activities may disturb or destroy fossils or bedrock of palaeontological sensitivity.	Low (Negative)	<ul style="list-style-type: none"> If bedrock is exposed during excavations, a qualified specialist must be appointed to inspect excavations for the presence of fossils. If excavations will not expose bedrock, no further mitigation for palaeontological heritage is recommended. 	Low (Negative)	Low
Social Impacts				
Traffic disturbances to commuters and local community as a result of road closures or construction activities occurring within the road reserve.	Low (Negative)	<ul style="list-style-type: none"> Traffic control measures must be put in place if the need arises during the construction phase. Ensure effective communication with all interested and affected parties, detailing the period of construction as well as alternative access routes if they are available 	Low (Negative)	Low
Risk associated with poor communication between landowners and the project team that may arise is conflict	Low (Negative)	<ul style="list-style-type: none"> All I&APs must be identified and informed of the proposed project and included in the life cycle of the proposed project. All comments received from the public must be addressed as per the PPP process outlined in the NEMA 2014 EIA regulations. 	Low (Negative)	Low
Rehabilitation				
Construction activities may lead to the disturbance of the site and areas within the development footprint.	Low (Negative)	<ul style="list-style-type: none"> Construction rubble must be collected and disposed of at a suitable landfill site; and All alien vegetation in the footprint area as well as immediate vicinity of the proposed development should be removed. Alien vegetation control should take place for a minimum period of two growing seasons after rehabilitation is completed. Implement an alien eradication plant programme to systematically control/eradicate the declared invasive plant species, especially during rehabilitation. 	Low (Negative)	Low



Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
		<ul style="list-style-type: none"> The pipeline route should be rehabilitated in accordance with a rehabilitation and monitoring plan (to be approved by an ecologists) in order to improve/restore grassland function, richness and to enhance faunal dispersal. Post-development rehabilitation should use species indigenous to South Africa, and should preferably make use of species that are naturally growing along the route. Plants that would otherwise be destroyed during construction, should be used for re-vegetation / landscaping purposes. 		

C. Operational Phase: Potential impacts, significance (pre- and post-mitigation) and mitigation measures

Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
Geology and soil				
Soil pollution due to hazardous chemical substances including fuel greases and oils used on site during the maintenance or spill event associated with the proposed project activities.	Medium (Negative)	<ul style="list-style-type: none"> Identify all hazardous chemical substances used on site, including fuel, greases and oils. Obtain the material safety data sheets for each of the hazardous chemical substances. Appropriate equipment to deal with emergency spill incidents is to be readily available on site. This includes fire extinguishers, spill kits for hydrocarbon spills, drip trays for equipment and/or machinery leaks, drums or containers for contaminated water. Immediately clean all spillages of fuels, lubricants and other petroleum-based products. Soil and other material contaminated with hazardous chemical substances shall be treated as hazardous waste and removed from site. 	Low (Negative)	Low
Risk of soil erosion during maintenance activities that may be required for the proposed project activities(Sewer line and Pump station upgrade).	Medium (Negative)	<ul style="list-style-type: none"> Contractors are to ensure that all reasonable measures are taken to limit erosion during the construction phase. Don't allow erosion to develop to a large scale before taking action. During maintenance, existing roads and tracks should be used as far as possible. Vegetation establishment should be monitored to ensure that vegetation cover is sufficient to prevent erosion development. 	Low (Negative)	Low



Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
Fauna and flora				
Increased spread of alien and invasive plant species during the operational phase of the proposed development	Medium (Negative)	<ul style="list-style-type: none"> Alien invasive species should be removed (prioritising category 1 A & B species). All alien seedlings and saplings must be removed as they become evident. Manual/mechanical removal should be used rather than chemical control. Hazardous chemicals may impact upon natural vegetation in the area as well as the freshwater resources. Implement alien and invasive plant control plan with regular follow-up 	Low (Negative)	Low
Freshwater resources				
Potential failure of infrastructure: possible leaks from pipeline into freshwater resources.	Medium (Negative)	<ul style="list-style-type: none"> It should be ensured that additional freshwater areas are not inundated as a result of leaks or bursting of the pipeline, and that an emergency plan should be compiled to ensure a quick response and attendance to the matter in case of a leakage or bursting of the pipeline. Only existing roadways should be utilised during maintenance and monitoring activities to avoid indiscriminate movement of vehicles. 	Low (Negative)	Low
Indiscriminate movement of vehicles and vegetation trampling within the freshwater resources during maintenance activities, resulting in soil compaction and disturbance, which could result in increased alteration of the vegetation community structure.				
Department of Water and Sanitation Risk Assessment				
<p><u>Operations and maintenance of proposed sewer pipeline and Serengeti pump station within (the unnamed tributary of the Rietvlei river and associated floodplain wetland.) and potential contamination of freshwater soils, groundwater and surface water.</u></p> <p>Vehicular access to the sewer pipeline resulting in:</p> <ul style="list-style-type: none"> Soil compaction Vegetation degradation Soil and stormwater contamination from oils and Hydrocarbons <p>Contamination of the freshwater resources with additional sewage effluent resulting in:</p> <ul style="list-style-type: none"> Increased concentration of salts, nitrate and toxic ammonia concentrations, as well as counts of Escheria coli <p>Potential eutrophication of the system, including anoxic conditions, leading to biodiversity simplification and the</p>	Medium (Negative)	<ul style="list-style-type: none"> The sewer pipeline must be encased in concrete along its entire length (where underground) and the joints of the above ground sewer pipeline regularly inspected, and pressure tested for integrity upon the completion of construction. It is recommended that the managing authority test the integrity of the sewer pipeline at least once every five years or more often should there be any sign or reports of a leak. Should a blockage occur, all possible steps are to be taken to prevent the pollution of the watercourse during repair, including the placement of sheeting around the manhole used for access as well as containment barrels for any effluent withdrawn, should repair of the pipeline be required. 	Low (Negative)	Low



Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
<p>excess production of hydrogen sulphide gas as well as increased alien and invasive species encroachment.</p> <p>The installed infrastructure will be permanent and pose an increased risk over time in terms of the concrete weakening and cracking leading to leakages of the sewage. This may result in inputs of sewage effluent entering the freshwater system, and the following impacts:</p> <p>Increased concentration of salts, nitrate and toxic ammonia concentrations, as well as counts of <i>Escheria Coli</i>.</p> <p>Potential eutrophication of the system, including anoxic conditions, leading to biodiversity simplification and the excess production of hydrogen sulphide gas as well as increased alien and invasive species.</p>				
Terrestrial ecology				
Continued loss of terrestrial habitat, degradation of the terrestrial ecology and loss of potential species of conservation concern, by movement of vehicles during maintenance activities.	Medium (Negative)	<ul style="list-style-type: none"> No vehicles or maintenance personnel are to traverse through the sensitive freshwater habitat areas unnecessarily. Restrict maintenance vehicles to travelling only on designated roadways to limit the ecological footprint of the proposed development on the grassland habitat. No informal fires are allowed by construction personnel outside of the development footprint. 	Low (Negative)	Low
Groundwater				
<p>Groundwater pollution due to maintenance activities undertaken for the proposed project activities. That may include:</p> <ul style="list-style-type: none"> Potential spills as a result of failure in the sewage infrastructure due to poor maintenance. Potential spills of hazardous chemical substances including fuel, greases and oils used on site during maintenance activities. 	Low (Negative)	<ul style="list-style-type: none"> Identify all hazardous chemical substances used on site including fuel, greases and oils. Obtain the material safety data sheets for each of the hazardous chemical substances. Ensure that the material safety data sheets have sufficient information to enable the user to take the necessary measures to protect his/her health and safety and that of the environment. Material safety data sheets for all hazardous chemical substances must be readily available on site. Appropriate equipment to deal with emergency spill incidents is to be readily available on site. This includes fire extinguishers, spill kits for hydrocarbon spills, drip trays for equipment and/or machinery leaks, drums or containers for contaminated water. 	Low (Negative)	Low



Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
		<ul style="list-style-type: none"> Soil contaminated with hazardous chemical substances shall be treated as hazardous waste and removed from site. During refuelling, the ground must be protected, and proper dispensing equipment is to be used. All liquid fuels are to be stored in tanks and containers with lids on an impermeable surface in a bunded area. Generators must be stored on concrete floors in bunded areas. 		
Atmosphere and noise				
Ambient noise levels are likely to increase as a result of maintenance activities that may occur during the operational phase.	Low (Negative)	<ul style="list-style-type: none"> Maintenance activities that may generate noise must be conducted during daytime hours. Vehicles and equipment must be inspected and maintained on a regular basis. Working hours should be restricted to daylight hours. No sound amplification equipment such as sirens, loud halers or hooters are to be used on site except in emergencies. A complaints register should be kept on site. The register must record the following: Date when complaint was received, name of person who reported the complaint, details of the complaint and when and how the concern was addressed. 	Low (Negative)	Low
Socio-economic				
Creation of Jobs and transfer of skills.	High (Positive)	<ul style="list-style-type: none"> The proposed upgrading of the existing Serengeti pump station and the proposed construction of the sewer line will result in the creation of new jobs during the construction phase of the development and workers will be sourced from the local community. The proposed development will promote skills development as there will be transfer of skills that will occur as part of the construction phase of the development. 	High (Positive)	High (Positive)
Sourcing of local goods and services.	High (Positive)	<ul style="list-style-type: none"> Materials and services will be sourced locally, and this will result in a positive economic impact as the revenue generated will be beneficial to the local economic development of the Kempton Park and surrounding areas. 	High (Positive)	High (Positive)
Improved functioning of the sewage infrastructure in the greater Kempton Park area.	High (Positive)	<ul style="list-style-type: none"> The proposed pipeline forms part of the greater Pomona Eastern Outfall Sewer. The proposed development provides a solution to the sewer capacity challenges that the municipality faces in terms of efficient sanitation service provision. 	High (Positive)	High (Positive)
Increased capacity to deal with the anticipated future	High	<ul style="list-style-type: none"> The proposed sewer pipeline has been designed with consideration for 	High	High



Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
volumes of sewage as a result of development in the area.	(Positive)	anticipated growth trends in the greater Kempton Park area. The proposed pipeline will provide efficient sanitation services in the future as it is designed to effectively handle the expected increase in sewage flows associate with the anticipated development in the area.	(Positive)	(Positive)
Increased development and economic growth within area.	High (Positive)	<ul style="list-style-type: none"> Increase in development opportunities that promote local economic development as the improved sewage capacity will be able to support future developmental opportunities within the area 	High (Positive)	High (Positive)

D. Decommissioning Phase : Potential impacts, significance (pre- and post-mitigation) and mitigation measures

Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
No decommissioning is foreseen in the near future for the proposed project. However, should decommission be required, a closure plan will be submitted to the competent authority for approval and it will comply to the relevant legislation at the time of closure.				

2.2 Alternative 1 (not supported)

Please see below an assessment of the potential impacts that may arise from the planning, construction and operational phase of the proposed development (Layout Alternative 1)

A. Planning/pre-construction phase: Potential impacts, significance (pre- and post-mitigation) and mitigation measures.

Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
Risk of non-compliance with legal requirements of national and provincial legislation in terms of the proposed development .	Medium (Negative)	<ul style="list-style-type: none"> Ensure that all environmental legal requirements are considered in the planning phase as the proposed activity in terms of section 2 of this report: Applicable Legislation, Policy and Guidelines. Appoint an EAP to ensure that all proposed activities and associated infrastructure in all phases of the proposed development are assessed 	Low (Negative)	Low



Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
		<p>in terms of the applicability to the relevant environmental legislation and the subsequent permits/license/ authorisations that may be required.</p> <ul style="list-style-type: none"> All changes in the proposed project scope must be well communicated with the EAP to reduce the risk of non-compliance with the necessary legal requirements. 		
Risk of incorrect site layout.	Medium (Negative)	<ul style="list-style-type: none"> Ensure efficient communication during project planning and inception meetings between all stakeholders involved in the proposed development. The development footprint area must be clearly demarcated. 	Low (Negative)	Low
Shortage of municipal service supply for the proposed construction activities.	Medium (Negative)	<ul style="list-style-type: none"> The project developer must ensure sufficient basic municipal services (Water and Electricity) are in place prior to the commencement of construction activities. This will ensure that no delays occur during construction. 	Low (Negative)	Low
Harm to the environment due to inadequate planning and design of the proposed development.	Medium (Negative)	<ul style="list-style-type: none"> Suitable specialist(s) has been appointed to identify sensitive environmental features (including fauna, flora, and Freshwater/wetland). Mitigation measures provided by the specialist will be implemented. During site preparation, topsoil and subsoil are stripped separately from each other and must be stored separately for use in the rehabilitation phase. It should be protected from wind and rain, as well as contamination from diesel, concrete or wastewater. Records of all environmental incidents must be maintained, and a copy of these records must be made available to authorities on request throughout the project execution. Posters should be displayed on site to sensitise workers to fauna in the region. During site preparation, special care must be taken during the clearing of the works area to minimise damage or disturbance of roosting and nesting sites. No access is allowed in no-go areas without the permission of the Project Manager. Contractor to develop method statements that must be approved by the Project Manager prior to construction taking place. The plan must show the following (as relevant), at a minimum: <ul style="list-style-type: none"> Buildings and structures; Site offices; Roads and access routes; Gates and fences; Essential services (permanent and temporary water, electricity and sewage); Rubble and waste rock storage and disposal sites; 	Low (Negative)	Low



Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
		<ul style="list-style-type: none"> ○ Solid waste storage and disposal sites; ○ Site toilets and ablutions; ○ Topsoil stockpiles; ○ Sensitive environmental features; and ○ Any other activities, facilities and structures deemed relevant. • Design to consider and incorporate environmental requirements. • Define and communicate roles and responsibilities for the implementation of the EMP. • Develop and implement an environmental awareness plan. • The appointment of an Environmental Control Officer (ECO). • Before construction commences, all the sensitive areas must be clearly demarcated with fencing or orange mesh netting. However, the barricading measures to be utilised should restrict the movement of the fauna in the area from falling into open trenches. • Records of compliance / non-compliance must be kept on site at all times and must be made available to GDARD on request. • Records of all environmental incidents must be maintained, and a copy of these records be made available to GDARD on request throughout the proposed project execution. • During site preparation, special care must be taken during the clearing of the works area where organic material must be stored separately from the topsoil. Further, the topsoil must also be stored separately from the subsoil material to ensure for the protection thereof and that it can be reused during the rehabilitation phase. • Protected plant species should be identified prior to construction activities and should be removed (with the applicable permits). These should then be used for re-vegetation during rehabilitation. • Prior to construction, fences/barricading should be used in such a manner to prevent access to adjacent grassland areas which are not part of the pipeline servitude. 		
Poor communication and lack of transparency of project information that may lead to conflict.	Medium (Negative)	<ul style="list-style-type: none"> • All I&APs must be identified and informed of the proposed project and included in the life cycle of the proposed project. • All comments received from the public must be addressed as per the PPP process outlined in the NEMA 2014 EIA regulations. 	Low (Negative)	Low



B. Construction phase: Potential impacts, significance (pre- and post-mitigation) and mitigation measures

Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
Legislative requirements				
Non-compliance with legal requirements of the EA	Medium (Negative)	<ul style="list-style-type: none"> Ensure that all environmental legal requirements are considered in the planning phase such as the conditions outlined in the EA and other relevant permits/license. All mitigation measures outline in the EMPr must be followed. Confirm that there are no changes to the original scope of works as authorised in the environmental authorisation. 	Low (Negative)	Low
Development footprint				
Risk of construction activities occurring outside the development.	Medium (Negative)	<ul style="list-style-type: none"> The boundaries of footprint areas, including contractor laydown areas are to be clearly defined and it should be ensured that all activities remain within the defined footprint areas. Edge effects must be carefully controlled. 	Low (Negative)	Low
Health and safety				
Risk of damage caused by fires on site.	Medium (Negative)	<ul style="list-style-type: none"> No fires are permitted in or near the construction area. 	Low (Negative)	Low
Health and safety risk that may arise and impact on the public and construction workers.	Medium (Negative)	<ul style="list-style-type: none"> Ensure that all signage of safety risk that may be present are clearly marked and cordoned off from the public. All activities must comply with the Occupational Health and Safety Act (No 85 of 1993). 	Low (Negative)	Low
Geology and soil				
Soil pollution due to hazardous chemical substances including fuel greases and oils used on site.	Medium (Negative)	<ul style="list-style-type: none"> Identify all hazardous chemical substances used on site, including fuel, greases and oils. Obtain the material safety data sheets for each of the hazardous chemical substances. Appropriate equipment to deal with an emergency spill incident must be readily available on site. This includes fire extinguishers, spill kits for hydrocarbon spills, drip trays for equipment and/or machinery leaks, drums or containers for contaminated water. Immediately clean all spillages of fuels, lubricants and other petroleum-based products. Soil and other material contaminated with hazardous chemical substances shall be treated as hazardous waste and removed from site. 	Low (Negative)	Low



Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
Exposure to soil erosion and compaction of soil along the proposed rising main route.	High (Negative)	<ul style="list-style-type: none"> • Contractors must ensure that all reasonable measures are taken to preserve topsoil. • During site preparation, topsoil and subsoil should be stripped separately from each other and must be stored separately for use in the rehabilitation phase. • Topsoil must be protected from wind and rain, as well as contamination from diesel, concrete or wastewater. • Contractors are to ensure that all reasonable measures are taken to limit erosion during the construction phase. • Do not allow erosion to develop to a large scale before taking action. • Existing roads and tracks should be used as far as possible. • Retain vegetation and soil in position as long as possible. It should only be removed immediately ahead of construction. • Remove only the vegetation essential for construction. No disturbance of adjoining vegetation should be allowed. • Colonisation of the disturbed areas should be monitored to ensure that vegetation cover is sufficient within one growing season. • Stockpiles can be covered with shade netting to minimise wind- and water erosion. 	Medium (Negative)	Medium
Risk of soil instability due to geological conditions	High (Negative)	<ul style="list-style-type: none"> • The geology of the site has potentially collapsible soil and a high potential for sinkholes as the site is underlain by dolomite. • The site selection must take into consideration the Geotechnical specialist recommendations. • The Geotechnical report supports the proposed layout as the site is considered suitable for the proposed development of the rising main from a geological perspective • The proposed layout is preferred from a geological perspective. 	Medium (Negative)	Medium
Fauna and flora				



Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
The removal of vegetation will expose soils which may lead to soil erosion.	High (Negative)	<ul style="list-style-type: none"> Remove only the vegetation where essential for construction and don't allow any disturbance to adjoining natural vegetation cover. Protect all areas susceptible to erosion (stockpiled soils) and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction site. Don't allow erosion to develop on a large scale before taking action. A temporary fence or demarcation must be erected around the construction area to prevent access to sensitive environments. Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction. Once construction is complete, the temporary road should be obliterated, and the area rehabilitated. After construction, the land must be cleared of rubbish, surplus materials and equipment, and all parts of the land must be left in a condition as close as possible to that prior to construction. Rehabilitation measures provided in the EMP as per section 55.2 must be followed. 	Medium (Negative)	Medium
Spread of alien invasive plant species from the transformed areas to the natural vegetation.	Medium (Negative)	<ul style="list-style-type: none"> Alien invasive species should be removed (prioritizing NEMBA category 1A & B species). All alien seedlings and saplings must be removed as they become evident. Manual/mechanical removal should be used rather than chemical control. Hazardous chemicals may impact upon natural vegetation in the area as well as the freshwater resources. All equipment and vehicles should be thoroughly cleaned prior to access the study area to prevent the spread of alien invasive vegetation 	Low (Negative)	Low
Disturbance of sensitive vegetation.	High (Negative)	<ul style="list-style-type: none"> Any sensitive vegetation present on site must be demarcated to avoid disturbance. If removal is required, a qualified specialist should remove and relocated the sensitive vegetation. Fences/barricading should be used in such a manner to prevent access to adjacent grassland areas which are not part of the proposed pipeline servitude. 	Medium (Negative)	Medium
Damage to natural habitat due to construction activities and consequential displacement of faunal species.	High (Negative)	<ul style="list-style-type: none"> Construction activities should be restricted to the development footprint. The site should be cordoned off to restrict the movement of construction vehicles and personnel. No development should occur within any sensitive natural open spaces. 	Medium (Negative)	Medium



Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
Loss of ecosystem function such as reduction in water quality, soil pollution and underground water contamination and the consequent negative impacts on faunal species.	High (Negative)	<ul style="list-style-type: none"> Restrict construction activities to the development site. Prevent movement of construction personnel and vehicles outside of the development footprint. No development should occur within any sensitive natural open spaces. Minimise environmental pollution by effective implementation of the prescribed mitigation measures. All monitoring measures set out in section 7 of the EMPr must be followed to reduce the risk of loss of ecosystem functioning. 	Medium (Negative)	Medium
Disturbance of faunal species.	High (Negative)	<ul style="list-style-type: none"> Education of site workers and contractors about the value of wildlife and environmental sensitivity. Site workers and contractors should ensure that no animals are disturbed, trapped, hunted or killed during the construction phase. Conservation-orientated clauses should be included into contracts for construction personnel. Outside lighting should be designated to minimise impact on fauna. All outside lighting should be directed away from sensitive areas. Fluorescent and mercury vapour lighting should be avoided. Sodium vapour or LED lights should rather be used as far as possible. 	Medium (Negative)	Medium
Terrestrial ecology				
Loss of terrestrial habitat, diversity and species of conservation concern, caused from site preparation and vegetation clearing.	Medium (Negative)	<ul style="list-style-type: none"> Avoid disturbance of sensitive freshwater habitat units and grassland units identified along section 1 of the proposed pipeline route. Should any species of conservation concern be encountered within the construction footprint, they are to be relocated to suitable habitat by a qualified specialist. Demarcate the construction footprint and ensure that all construction activities remain within this footprint. Ensure that the proposed development footprint area remains as small as possible, particularly within the unnamed tributary Restrict vehicles to travelling only on designated roadways to limit the ecological footprint of the proposed development. No informal fires are allowed by construction personnel outside of the development footprint. The contractor laydown and construction areas should be rehabilitated with indigenous species when construction is completed. Monitoring of these rehabilitated areas should take place a year after the construction has been completed to ensure vegetation growth. An alien vegetation monitoring programme should be developed and 	Low (Negative)	Low



Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
		<ul style="list-style-type: none"> implemented for one year after construction activities have taken place. All areas of disturbed and compacted soils need to be ripped, reprofiled and reseeded with indigenous vegetation to prevent the establishment of alien and invasive species. During site preparation, topsoil and subsoil should be stripped separately from each other and must be stored separately for use in the rehabilitation phase. It should be protected from wind and rain, as well as contamination from diesel, concrete or wastewater. Rehabilitation measures provided in the EMPr as per section 55.2 must be followed. 		
Creation of access roads and the disturbance of the adjacent grasslands:	High (Negative)	<ul style="list-style-type: none"> Access to the proposed site must be through existing access roads, no new access roads must be constructed as part of the proposed development. No new access roads must be developed within the grassland habitat to avoid the dissecting (fragmenting) of grassland habitat by the placement of roads within grassland habitat. 	Medium (Negative)	Medium
Permanent to long-term loss of untransformed grassland, floristic richness and ecological condition (transformation from untransformed to secondary condition)	High (Negative)	<ul style="list-style-type: none"> Limit construction to access road servitude and prevent overspill of activities. An alternative route is recommended to the west of the access road corresponding to secondary grassland. 	Medium (Negative)	Medium
Poor waste management on site.	Medium (Negative)	<ul style="list-style-type: none"> Appropriate sanitary facilities must be provided for the life of the construction phase and all waste removed to an appropriate waste facility. Ensuring that an adequate number of waste and "spill" bins are provided will also prevent litter and ensure the proper disposal of waste and spills. 	Low (Negative)	Low
Freshwater Resources				
Risk of proposed activities occurring outside of the footprint of the existing Serengeti pump station (Located within the unnamed tributary of the Rietvlei river and associated floodplain wetland).	Medium (Negative)	<ul style="list-style-type: none"> All development footprint areas should remain as small as possible. It must be ensured that the freshwater habitat is off-limits to construction vehicles and non-essential personnel; Planning of temporary roads and access routes be restricted to existing roads where possible; If any infrastructure is to be placed in the freshwater resources, the extent of encroachment into the freshwater areas will need to be extremely well controlled and limited. All monitoring measures as per section 7 must be followed as well as monitoring upstream and downstream of the proposed activity should occur. 	Low (Negative)	Low



Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
Potential spills from the storage of hazardous goods	Medium (Negative)	<ul style="list-style-type: none"> All hazardous chemicals as well as stockpiles (especially those associated with open trenching within close proximity to freshwater resources) should be stored on bunded surfaces and have facilities constructed to control runoff from these areas; It must be ensured that all hazardous storage containers and storage areas comply with the relevant SABS standards to prevent leakage. 	Low (Negative)	Low
Potential spills and leaks from vehicles delivering construction material (during refuelling of vehicles, leaks from hazardous material containers)	Medium (Negative)	<ul style="list-style-type: none"> Should any leakages from construction vehicles or material containers occur, they should be cleaned up immediately. Refuelling of vehicles should take place on a sealed surface to prevent ingress of hydrocarbons into the soil. Construction vehicles should be restricted to designated roads only. Contractor laydown areas should be located outside the freshwater resources and the associated buffer zones (in consultation with the appropriate authority) to avoid contamination of the freshwater environment due to leakages from storage containers and vehicles. 	Low (Negative)	Low
Potential spills and leaks from onsite chemical toilets.		<ul style="list-style-type: none"> Vehicles to be serviced at the contractor laydown area, and concrete shall also be mixed in that area so much as is possible. Additional mixing of concrete may be required on site, and when this occurs, batter boards must be used, and sheeting shall be laid down to ensure concrete does not mess outside of the trenches. Footprint area should be demarcated and kept as small as possible. Chemical toilets must be serviced on a regular basis all waste must be removed and treated at a licensed waste facility. The extent of vegetation clearing should be limited for the contractor's laydown area and outside of the freshwater environment. The contractor laydown area should be rehabilitated with indigenous species when construction is completed. Monitoring of these 		



Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
Indiscriminate movement of vehicles within the freshwater resource.	Yellow background	<p>rehabilitated areas should take place a year after the construction has been completed to ensure vegetation growth.</p> <ul style="list-style-type: none"> • An alien vegetation monitoring programme should be developed and implemented for the first growing season after construction activities have taken place. • The duration of activities within the freshwater resources (especially that of the floodplain wetland) should be minimised in order to reduce the flow and functioning of the freshwater system. • The freshwater resource areas must be clearly demarcated with danger tape by an environmental control officer (ECO) and marked as a no-go area. • Excavated soils should be placed outside the freshwater resources and the associated buffer zones to limit potential sedimentation of the freshwater resources. • Soil should be covered to avoid being blown by the wind and prevent sediment runoff during rainfall events. • Soil must be recompacted to a depth of 450 mm, and all construction material must be removed from site upon the completion of construction. • The area must be rehabilitated after the completion of the construction phase. In addition, alien vegetation eradication programme must be implemented. • If stockpiled soil is to be used for rehabilitation purposes such as revegetation, all alien vegetation should be removed from soil before use, to avoid spread of alien vegetation. • Excavated soil should be used to close off the trenches, immediately after inserting the pipeline. • Flow diversion by means of scaffolding (created during the installation of the pipeline underneath the bridge structure) should be done properly to avoid inundation of the area as well as drying out of downstream areas. • The area must be rehabilitated immediately after the completion of construction activities. In addition, excavated soils can be used to level the area as well as revegetating the area. 	Green background	
Clearing of vegetation during site preparations, and creating contractor laydown areas.				
Topsoil stockpiling adjacent to the freshwater resources.				



Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
Potential indiscriminate waste disposal (disposal of waste material such as soil, rocks, concrete chemicals and litter within the freshwater resources)		<ul style="list-style-type: none"> No disposal of waste should take place within the freshwater resources or its buffer zones. All construction rubble should be removed from the wetlands. Waste disposal bins must be provided for the duration of the construction phase. Waste bins must be emptied regularly, and the waste must be removed to a suitable waste disposal facility. Sanitation services must be provided for construction personnel, whereby at least one portable toilet will be provided per ten personnel and will be emptied regularly. Construction personnel must be informed that no firewood is to be harvested, all litter must be stored immediately and only in closed dustbins, including cigarette ends, and no litter is to remain behind on site following completion of construction activities. 		
Department of Water and Sanitation Risk Assessment				
<p><u>Site clearing prior to commencement of construction activities:</u></p> <p>Exposure of soils, leading to increased runoff and erosion, and thus increased sedimentation of the freshwater resources.</p> <p>Increased sedimentation of freshwater resources, leading to smothering of biota and potentially altering surface water quality.</p> <p>Decreased ecoservice provision.</p>	Low (Negative)	<ul style="list-style-type: none"> Contractor laydown areas and stockpiles to be established outside of the delineated freshwater resources zone and the applicable buffer zones in consultation with the appropriate authority. Vehicles to be serviced at the contractor laydown area, and concrete shall also be mixed in that area so much as is possible. Concrete may require additional mixing on site, and when this occurs batter boards must be used, and sheeting shall be laid down to ensure concrete does not mess outside of the trenches. The freshwater areas must be clearly demarcated with danger tape by an ECO and marked as a no-go area. During trenching no stockpiling of soils is to take place within the freshwater resources. All exposed soils must be protected for the duration of the construction phase with a suitable geotextile (e.g. Geojute or hessian sheeting) in order to prevent erosion and sedimentation of the freshwater resources. 	Low (Negative)	Low
<p><u>Ground-breaking, excavation of trench as part of the proposed upgrading of the existing Serengeti pump station and installation of the proposed rising main (within the unnamed tributary of the Rietvlei River):</u></p> <p>Disturbances of soils leading to increased alien vegetation proliferation, and in turn to further altered freshwater habitat.</p>	Low (Negative)	<ul style="list-style-type: none"> All manholes should be raised above the 1:100-year flood line as specified in the Aquatic Assessment by SAS dated August 2017. Soil must be recompacted to a depth of 450 mm, and all construction material must be removed from site upon the completion of construction in the Aquatic Assessment by SAS dated August 2017. Sanitation services must be provided for construction personnel, whereby at least one portable toilet will be provided per ten personnel 	Low (Negative)	Low



Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
Altered runoff patterns, leading to increased erosion and sedimentation of freshwater habitat.		and will be emptied regularly		
<u>Potential indiscriminate waste disposal:</u> Altered flow regime as a result of solid wastes within the freshwater resources Altered water quality due to chemical waste disposal	Low (Negative)	<ul style="list-style-type: none"> Construction personnel must be informed that no firewood is to be harvested, all litter must be stored immediately and only in closed dustbins, including cigarette ends, and no litter is to remain behind on site following completion of construction activities. 	Low (Negative)	Low
<u>Potential spillage from construction vehicles:</u> Possible contamination of freshwater soils and surface water, leading to reduced ability to support biodiversity.	Low (Negative)		Low (Negative)	Low
Groundwater				
Groundwater pollution due to unsanitary conditions on site.	Medium (Negative)	<ul style="list-style-type: none"> Sufficient ablution facilities shall be provided – 1 toilet per 10 workers. Ablution facilities should be on impermeable surfaces and at least 50 m from wetlands, drainage lines or places where storm water may accumulate. The location of the ablution facilities is to be approved by the ECO prior to site establishment but shall be located within 100 m of any work point. Ablating anywhere other than in toilets shall not be allowed. Ablution facilities are to be secured. The contractor shall ensure that no chemical and/or waste from the ablution facilities are spilled on the ground at any time. Ablution facilities should be serviced weekly or more frequently if required. Contents are to be removed from site on a regular basis. Ablution facilities should be inspected and maintained to prevent and minimise blockages and leakages. Records of sewage disposal and maintenance shall be maintained and kept on file Toilets should have properly closing doors and be supplied with toilet paper. Awareness of the importance of proper hygiene should be created among employees. 	Low (Negative)	Low
Groundwater pollution due to poor management and	Medium	<ul style="list-style-type: none"> Identify all hazardous chemical substances used on site including fuel, 	Low	Low



Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
accidental spills of hazardous chemical substances including fuel, greases and oils used on site.	(Negative)	greases and oils. <ul style="list-style-type: none"> Obtain the material safety data sheets for each of the hazardous chemical substances. Ensure that the material safety data sheets have sufficient information to enable the user to take the necessary measures to protect his/her health and safety and that of the environment. Material safety data sheets for all hazardous chemical substances must be readily available on site. Appropriate equipment to deal with emergency spill incidents is to be readily available on site. This includes fire extinguishers, spill kits for hydrocarbon spills, drip trays for equipment and/or machinery leaks, drums or containers for contaminated water. Soil contaminated with hazardous chemical substances shall be treated as hazardous waste and removed from site for safe disposal (records of such shall be maintained). During refuelling, the ground must be protected, and proper dispensing equipment is to be used. All liquid fuels are to be stored in tanks and containers with lids on an impermeable surface in a bunded area. Generators must be stored on concrete floors in bunded areas. 	(Negative)	
Storm water management				
Surface runoff and associated sedimentation as a result of construction activities.	Medium (Negative)	<ul style="list-style-type: none"> Sheet runoff from access roads should be slowed down by the strategic placement of berms. As far as possible, all construction activities should occur in the low flow season, during the drier winter months. Appropriate storm water management features should be installed along the perimeter of the access road and the pipeline trench to prevent excessive run-off of storm water (and potential erosion) into the surrounding grassland habitat (this could result in compositional floristic changes). 	Low (Negative)	Low
Atmosphere and noise				
Ambient noise levels are likely to increase because of the construction activities.	Medium (Negative)	<ul style="list-style-type: none"> Noise generating activities must be conducted during daytime hours. Vehicles and equipment must be inspected and maintained on a regular basis. Working hours should be restricted to daylight hours. No sound amplification equipment such as sirens, loud halers or hooters are to be used on site except in emergencies. A complaints register should be kept on site. The register must record 	Low (Negative)	Low



Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
		the following: Date when complaint was received, name of person who reported the complaint, details of the complaint and when and how the concern was addressed.		
Degradation of ambient air quality due to dust and exhaust emission generation.	Medium (Negative)	<ul style="list-style-type: none"> A water cart should be kept on site to water down dusty construction activities. A complaints register should be kept on site. The register must record the following: Date when complaint was received, name of person who reported the complaint, details of the complaint and when and how the concern was addressed. Open areas should be re-vegetated. Regular maintenance of vehicles and equipment should be undertaken. Optimal engine combustion will allow for "cleaner" exhaust emissions. 	Low (Negative)	Low
Heritage and Palaeontology				
Construction activities may disturb or destroy sites, features or artefacts of archaeological and/or historical importance.	Low (Negative)	<ul style="list-style-type: none"> If during any construction activities, any sites, features or objects of cultural heritage (archaeological or historical) nature are exposed, a qualified specialist should be contacted to investigate, and suitable mitigation measures must be implemented. All activities in the area should be stopped until the situation has been resolved 	Low (Negative)	Low
Construction activities may disturb or destroy fossils or bedrock of palaeontological sensitivity.	Low (Negative)	<ul style="list-style-type: none"> If bedrock is exposed during excavations, a qualified specialist must be appointed to inspect excavations for the presence of fossils. If excavations will not expose bedrock, no further mitigation for palaeontological heritage is recommended. 	Low (Negative)	Low
Social Impacts				
Traffic disturbances to commuters and local community as a result of road closures or construction activities occurring within the road reserve.	Low (Negative)	<ul style="list-style-type: none"> Traffic control measures must be put in place if the need arises during the construction phase. Ensure effective communication with all interested and affected parties, detailing the period of construction as well as alternative access routes if they are available. 	Low (Negative)	Low
Risk associated with poor communication between landowners and the project team that may arise is conflict	Low (Negative)	<ul style="list-style-type: none"> All I&As must be identified and informed of the proposed project and included in the life cycle of the proposed project. All comments received from the public must be addressed as per the PPP process outlined in the NEMA 2014 EIA regulations. 	Low (Negative)	Low
Increased economic cost associated with aligning the route as the proposed route follows the existing alignment.	Medium (Negative)	<ul style="list-style-type: none"> The proposed route (Preferred) provides a practical and cost effective option for the proposed development and should be followed. 	Low (Negative)	Low
Rehabilitation				
Construction activities may lead to the disturbance of the	Low	<ul style="list-style-type: none"> Construction rubble must be collected and disposed of at a suitable 	Low	Low



Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
site and areas within the development footprint.	(Negative)	<p>landfill site; and</p> <ul style="list-style-type: none"> All alien vegetation in the footprint area as well as immediate vicinity of the proposed development should be removed. Alien vegetation control should take place for a minimum period of two growing seasons after rehabilitation is completed. Implement an alien eradication plant programme to systematically control/eradicate the declared invasive plant species, especially during rehabilitation. The pipeline route should be rehabilitated in accordance with a rehabilitation and monitoring plan (to be approved by an ecologists) in order to improve/restore grassland function, richness and to enhance faunal dispersal. Post-development rehabilitation should use species indigenous to South Africa, and should preferably make use of species that are naturally growing along the route. Plants that would otherwise be destroyed during construction, should be used for re-vegetation / landscaping purposes. 	(Negative)	

C. Operational Phase : Potential impacts, significance (pre- and post-mitigation) and mitigation measures

Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
Geology and soil				
Soil pollution due to hazardous chemical substances including fuel greases and oils used on site during the maintenance or spill event associated with the proposed project.	Medium (Negative)	<ul style="list-style-type: none"> Identify all hazardous chemical substances used on site, including fuel, greases and oils. Obtain the material safety data sheets for each of the hazardous chemical substances. Appropriate equipment to deal with emergency spill incidents is to be readily available on site. This includes fire extinguishers, spill kits for hydrocarbon spills, drip trays for equipment and/or machinery leaks, drums or containers for contaminated water. Immediately clean all spillages of fuels, lubricants and other petroleum-based products. Soil and other material contaminated with hazardous chemical 	Low (Negative)	Low



Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
		substances shall be treated as hazardous waste and removed from site.		
Risk of soil erosion during maintenance activities that may be required for the proposed project.	Medium (Negative)	<ul style="list-style-type: none"> Contractors are to ensure that all reasonable measures are taken to limit erosion during the construction phase. Don't allow erosion to develop to a large scale before taking action. During maintenance, existing roads and tracks should be used as far as possible. Vegetation establishment should be monitored to ensure that vegetation cover is sufficient to prevent erosion development. 	Low (Negative)	Low
Risk to structural instability	High (Negative)	<ul style="list-style-type: none"> The proposed route (preferred) is supported from a geotechnical perspective and should be followed. 	Medium (Negative)	Medium
Fauna and flora				
Increased spread of alien and invasive plant species during the operational phase of the proposed development	Medium (Negative)	<ul style="list-style-type: none"> Alien invasive species should be removed (prioritising category 1 A & B species). All alien seedlings and saplings must be removed as they become evident. Manual/mechanical removal should be used rather than chemical control. Hazardous chemicals may impact upon natural vegetation in the area as well as the freshwater resources. Implement alien and invasive plant control plan with regular follow-up. 	Low (Negative)	Low
Freshwater resources				
Potential failure of infrastructure: possible leaks from pipeline into freshwater resources.	Medium (Negative)	<ul style="list-style-type: none"> It should be ensured that additional freshwater areas are not inundated as a result of leaks or bursting of the pipeline, and that an emergency plan should be compiled to ensure a quick response and attendance to the matter in case of a leakage or bursting of the pipeline. Only existing roadways should be utilised during maintenance and monitoring activities to avoid indiscriminate movement of vehicles 	Low (Negative)	Low
Indiscriminate movement of vehicles and vegetation trampling within the freshwater resources during maintenance activities, resulting in soil compaction and disturbance, which could result in increased alteration of the vegetation community structure.				
Department of Water and Sanitation Risk Assessment				
<u>Operations and maintenance of proposed sewer pipeline and Serengeti pump station within (the unnamed tributary of the Rietvlei river and associated floodplain wetland.) and potential contamination of freshwater soils, groundwater and surface water.</u> Vehicular access to the sewer pipeline resulting in: <ul style="list-style-type: none"> - Soil compaction - Vegetation degradation - Soil and stormwater contamination from oils and 	Medium (Negative)	<ul style="list-style-type: none"> The sewer pipeline must be encased in concrete along its entire length (where underground) and the joints of the above ground sewer pipeline regularly inspected, and pressure tested for integrity upon the completion of construction. It is recommended that the managing authority test the integrity of the sewer pipeline at least once every five years or more often should there be any sign or reports of a leak. Should a blockage occur all possible steps are to be taken to prevent the pollution of the watercourse during repair, including the placement 	Low (Negative)	Low



Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
<p>Hydrocarbons</p> <p>Contamination of the freshwater resources with additional sewage effluent resulting in:</p> <ul style="list-style-type: none"> - Increased concentration of salts, nitrate and toxic ammonia concentrations, as well as counts of <i>Escheria coli</i> <p>Potential eutrophication of the system, including anoxic conditions, leading to biodiversity simplification and the excess production of hydrogen sulphide gas as well as increased alien and invasive species encroachment.</p> <p>The installed infrastructure will be permanent and pose an increased risk over time in terms of the concrete weakening and cracking leading to leakages of the sewage. This may result in inputs of sewage effluent entering the freshwater system, and the following impacts:</p> <p>Increased concentration of salts, nitrate and toxic ammonia concentrations, as well as counts of <i>Escheria Coli</i>. Potential eutrophication of the system, including anoxic conditions, leading to biodiversity simplification and the excess production of hydrogen sulphide gas as well as increased alien and invasive species.</p>		<p>of sheeting around the manhole used for access as well as containment barrels for any effluent withdrawn Should repair of the pipeline be required to.</p>		
Terrestrial ecology				
<p>Continued loss of terrestrial habitat, degradation of the terrestrial ecology and loss of potential species of conservation concern, by movement of vehicles during maintenance activities.</p>	Medium (Negative)	<ul style="list-style-type: none"> • No vehicles or maintenance personnel are to traverse through the sensitive freshwater habitat areas unnecessarily. • Restrict maintenance vehicles to travelling only on designated roadways to limit the ecological footprint of the proposed development on the grassland habitat. • No informal fires are allowed by construction personnel outside of the development footprint. 	Low (Negative)	Low
Groundwater				
<p>Groundwater pollution due to maintenance activities undertaken for the proposed project. That may include:</p> <ul style="list-style-type: none"> - Potential spills as a result of failure in the sewage infrastructure due to poor maintenance. 	Low (Negative)	<ul style="list-style-type: none"> • Identify all hazardous chemical substances used on site including fuel, greases and oils. • Obtain the material safety data sheets for each of the hazardous chemical substances. 	Low (Negative)	Low



Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
<p>- Potential spills of hazardous chemical substances including fuel, greases and oils used on site during maintenance activities.</p>		<ul style="list-style-type: none"> • Ensure that the material safety data sheets have sufficient information to enable the user to take the necessary measures to protect his/her health and safety and that of the environment. • Material safety data sheets for all hazardous chemical substances must be readily available on site. • Appropriate equipment to deal with emergency spill incidents is to be readily available on site. This includes fire extinguishers, spill kits for hydrocarbon spills, drip trays for equipment and/or machinery leaks, drums or containers for contaminated water. • Soil contaminated with hazardous chemical substances shall be treated as hazardous waste and removed from site. • During refuelling, the ground must be protected, and proper dispensing equipment is to be used. • All liquid fuels are to be stored in tanks and containers with lids on an impermeable surface in a bunded area. • Generators must be stored on concrete floors in bunded areas. 		
Atmosphere and noise				
<p>Ambient noise levels are likely to increase as a result of maintenance activities that may occur during the operational phase.</p>	<p>Low (Negative)</p>	<ul style="list-style-type: none"> • Maintenance activities that may generate noise must be conducted during daytime hours. • Vehicles and equipment must be inspected and maintained on a regular basis. • Working hours should be restricted to daylight hours. • No sound amplification equipment such as sirens, loud halers or hooters are to be used on site except in emergencies. • A complaints register should be kept on site. The register must record the following: Date when complaint was received, name of person who reported the complaint, details of the complaint and when and how the concern was addressed. 	<p>Low (Negative)</p>	<p>Low</p>
Socio-economic				
<p>Creation of Jobs and transfer of skills.</p>	<p>High (Positive)</p>	<ul style="list-style-type: none"> • The proposed upgrading of the existing Serengeti pump station and the proposed construction of the sewer line will result in the creation of new jobs during the construction phase of the development and workers will be sourced from the local community. • The proposed development will promote skills development as there will be transfer of skills that will occur as part of the construction phase of the development. 	<p>High (Positive)</p>	<p>High (Positive)</p>
<p>Sourcing of local goods and services.</p>	<p>High (Positive)</p>	<ul style="list-style-type: none"> • Materials and services will be sourced locally, and this will result in a positive economic impact as the revenue generated will be beneficial to 	<p>High (Positive)</p>	<p>High (Positive)</p>



Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
		the local economic development of the Kempton Park and surrounding areas.		
Improved functioning of the sewage infrastructure in the greater Kempton Park area.	High (Positive)	<ul style="list-style-type: none"> The proposed pipeline forms part of the greater Pomona Eastern Outfall Sewer. The proposed development provides a solution to the sewer capacity challenges that the municipality faces in terms of efficient sanitation service provision. 	High (Positive)	High (Positive)
Increased capacity to deal with the anticipated future volumes of sewage as a result of development in the area.	High (Positive)	<ul style="list-style-type: none"> The proposed sewer pipeline has been designed with consideration for anticipated growth trends in the greater Kempton Park area. The proposed pipeline will provide efficient sanitation services in the future as it is designed to effectively handle the expected increase in sewage flows associate with the anticipated development in the area. 	High (Positive)	High (Positive)
Increased development and economic growth within area.	High (Positive)	<ul style="list-style-type: none"> Increase in development opportunities that promote local economic development as the improved sewage capacity will be able to support future developmental opportunities within the area 	High (Positive)	High (Positive)

D. Decommissioning Phase : Potential impacts, significance (pre- and post-mitigation) and mitigation measures

Potential impacts:	Significance rating of impacts prior to mitigation (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation (positive or negative):	Risk of the impact and mitigation not being implemented
No decommissioning is foreseen in the near future for the proposed project. However, should decommission be required, a closure plan will be submitted to the competent authority for approval and it will comply to the relevant legislation at the time of closure.				



2.3 No-go option

The proposed upgrading of the existing Serengeti pump station and the proposed construction of the sewer line from the Serengeti pump station to the connection at ERWAT forms part of the greater Pomona eastern outfall sewer project initiated by the City of Ekurhuleni. The proposed project is in response to the current sanitation service delivery challenges experienced as the current sewage infrastructure cannot cope with the increased flows. The proposed project will improve sanitation service capacity in the greater Kempton park area (east of the R21)

If the No-Go option was to occur, then the current status of the sanitation services will persist and worsen over time as the existing infrastructure is already, at the current flows, at full capacity. Over time the situation will deteriorate and the risk of failure of the existing infrastructure will increase. The positive impacts associated with improved environmental conditions in terms of the prevention of sewage spills that have been observed as a result in the failure of the existing infrastructural sewage capacity will not be realised. The associated positive impacts such as the provision of adequate and efficient sewage infrastructure in the greater Kempton Park area will not occur.

The positive socio-economic impacts associated with the creation of employment opportunities, sourcing of local goods and services will not be realised. The provision and availability of efficient sanitation service provision is essential for economic growth and as such if the proposed project were not to go ahead then the future opportunities for economic growth in the Kempton park will be lost if the No-go option is implemented.

List any specialist reports that were used to fill in the above tables. Such reports are to be attached in the appropriate Appendix.

The following specialist reports were used:

- Fresh Water Resource Assessment- Scientific Aquatic Services(SAS)-dated August 2017.
- Ecological Assessment by Pachnoda Consulting- dated August 2018.

Other reports :

- Preliminary Design Report(PDR) -VIP Consulting engineers-dated May 2018.

Describe any gaps in knowledge or assumptions made in the assessment of the environment and the impacts associated with the proposed development.

The following assumptions and limitations are applicable to the Freshwater Resource Assessment conducted by SAS (August 2017):

The following assumptions and limitations are applicable to this report:

- The determination of the freshwater resource boundaries and the assessment thereof, is confined to the freshwater resources traversed by, or within 50 m of, the proposed sewer pipeline. All freshwater resources identified within 500 m of the proposed sewer pipeline were delineated in fulfilment of Regulation GN509 of the NWA on a desktop level, however these resources were not assessed individually. The general surroundings were considered in the desktop assessment of the proposed sewer pipeline;
- Some areas within the study area have undergone significant anthropogenic influences (road construction, excavations) which have altered the soil profiles and vegetation composition, as a result, identification of the outer boundary of the temporary zone of some freshwater resources proved difficult in some areas. Therefore, the freshwater resource delineations as presented in this report are regarded as a best estimate of the boundaries based on the site conditions present, as observed during the site assessment. Global Positioning System (GPS) technology is inherently inaccurate and some inaccuracies due to the use of handheld GPS instrumentation may occur. If more accurate assessments are required, the freshwater resource boundaries will need to be surveyed and pegged according to surveying principles;

- Due to the season in which the site assessment was undertaken (winter period) and some areas of the freshwater resources subjected to seasonal fires, some floral species may not have been identified, as many of these species will have entered a period of dormancy, or alternatively have come to the end of the flowering period. Therefore, the use of vegetation species in aid of the delineation of freshwater resources proved to be limited in certain areas.
- Freshwater and terrestrial zones create transitional areas where an ecotone is formed as vegetation species change from terrestrial to obligate/facultative species. Within this transition zone, some variation of opinion on the freshwater resource boundary may occur. However, if the DWAF (2008) method is followed, all assessors should get largely similar results; and with ecology being dynamic and complex, certain aspects (some of which may be important) may have been overlooked. However, it is expected that the proposed development activities have been accurately assessed and considered, based on the field observations and the consideration of existing studies and monitoring data in terms of riparian and wetland ecology.

The following assumptions and limitations are applicable to the Ecological Assessment conducted by Pachnoda Consulting(August 2018)

- Please note that the inventories and the number of taxa listed in this document is by no means complete, and is merely a reflection of the dominant taxa on the study site obtained during a single (“snapshot”) instantaneous sampling session. In addition, focus was placed on the ecological conditions of the grassland sere and the potential occurrence of threatened and near threatened taxa, instead of providing a long list of species that could be present. Therefore, a comprehensive inventory, irrespective of the taxon or group of taxa could only be achieved during long-term temporal sampling. Therefore, a comprehensive species list of the untransformed parts of the study site cannot be compiled based on a brief, once-off field survey. In addition, the report provides a broad ecological investigation of the habitat units along the proposed pipeline route based on dominant floristic characters. Quantitative methods (*sensu stricto*) such as phytosociological sampling techniques and bird point counts were excluded owing to the small surface area of the study site.
- The information as presented in this document only has reference to the *investigated pipeline route* and cannot be applied to any other area without prior investigation. This company, the consultants and/or specialist investigators do not accept any responsibility for conclusions, suggestions, limitations and recommendations made in good faith, based on the information presented to them, obtained from the surveys or requests made to them at the time of this report.

3. Impacts that may result from the decommissioning and closure phase

Briefly describe and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the decommissioning and closure phase for the various alternatives of the proposed development. This must include an assessment of the significance of all impacts.

Proposal

No decommissioning is foreseen in the near future for the proposed project. However, should decommissioning be required, a closure plan will be submitted to the competent authority for approval and it will comply to the relevant legislation at the time of closure.

Alternative 1

No decommissioning is foreseen in the near future for the proposed project. However, should



decommissioning be required, a closure plan will be submitted to the competent authority for approval and it will comply to the relevant legislation at the time of closure.

Alternative 2

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented

List any specialist reports that were used to fill in the above tables. Such reports are to be attached in the appropriate Appendix.

Where applicable indicate the detailed financial provisions for rehabilitation, closure and ongoing post decommissioning management for the negative environmental impacts.

4. Cumulative impacts

Describe potential impacts that, on their own may not be significant, but is significant when added to the impact of other activities or existing impacts in the environment. Substantiate response:

Cumulative Impacts that may arise as a result of direct and indirect impacts associated with the proposed project as assessed in section 2 above (Impact Assessment) are as follows:

Proposed Layout (Preferred)

Degradation of sensitive environments over time as a result of construction and maintenance activities that were not efficiently mitigated:

Construction, run-off and accidental spillages may serve as a source of pollution, while siltation may occur during construction. Wastewater and accidental spillages from the manholes may further damage the wetland riparian zones if mitigation measures are not implemented.

Decrease of water quality in the unnamed tributary of the Rietvlei river and associated floodplain wetland (as a result of poor maintenance practices that may result in sewage spills that are not reported, and as a result may continue undetected.

Possible ground water contamination as a result of possible undetected failures in the sewage infrastructure that could lead to sewage spills that may serve as a source of ground water pollution.

The predicted cumulative impacts will however be low if managed according to the EMPr.

5. Environmental impact statement

Taking the assessment of potential impacts into account, please provide an environmental impact statement that sums up the impact that the proposal 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.

Proposal

The proposed layout has been assessed in terms of impacts that could arise during the planning, construction and operational phase of the proposed project. Decommissioning impacts were not considered



as the proposed project will result in the construction of permanent infrastructure. The impacts of the proposed project that have been identified in the planning phase of the development have been mitigated to low impact significance. These impacts relate to possible risk associated with non-compliance with legal requirements, incorrect site layout, shortage of municipal supply of services, poor communication and associated harm to the environment due to inadequate planning and design.

The impacts that have been identified in the construction phase relate to legislative requirements, the proposed development footprint, health and safety, geology and soils, flora and fauna and the terrestrial ecology of the area have all been mitigated to low impact significance. The potential impacts to the freshwater resources associated with the proposed activity relate the proposed upgrading of the existing Serengeti pump station and the construction of a small section of the proposed sewer pipeline. These impacts have been mitigated to low impact significance. The impacts identified in terms of risk of pollution (waste disposal) and spillages as a result of construction activities have been mitigated to low impact significance. Impacts that relate to ground water, storm water management, atmosphere and noise have all been mitigated to low significance.

Operational phase impacts associated with the maintenance of the sewer infrastructure on the surrounding environment have been mitigated to low impact significance. The proposed layout provides many positive socio-economic benefits with high (positive) impact significance that will occur during the operational phase of the proposed development, these impacts include:

- Creation of Jobs and transfer of skills,
- Sourcing of local goods and services,
- Improved functioning of the sewage infrastructure in the greater Kempton park area, and
- Increased capacity to deal with the anticipated future volumes of sewage as a result of development in the area.

The proposed layout is preferred as it possess a low risk to the environment and provides socio-economic benefits of high (positive) significance.

Alternative 1

Alternative 1 has been assessed in terms of impacts that could arise during the planning, construction and operational phase of the proposed development. The impacts associated with layout alternative 1 are very similar in nature to the proposed layout as it deviates from the proposed route at section 1 of the proposed pipeline (approximately 434 m).

The following negative impacts are associated with the alternative 1 and outweighs the positive impacts associated with the socio-economic benefits of layout alternative 1.

The impacts associated with the placement of the sewer line to the west of the existing access road has been assessed for the construction phase, structural instability due to geological conditions of the site are of high (negative) impact significance, with mitigation it may be reduced to medium (negative) significance, however the risk of the impact not being mitigated effectively is high.

The impacts on the sensitive grassland environment in terms of damage to the natural habitat, disturbance of faunal species and loss of ecosystem functioning are of high (negative) impact significance, with mitigation it may be reduced to medium (negative) significance. Operational phase impacts associated with the maintenance of the sewer infrastructure on the surrounding environment has been mitigated to low impact significance. The most significant risk during the operational phase is the risk of structural instability due to geological conditions of the site that creates a development constraint.

Layout alternative 1 involves the realignment of approximately 434 m of the proposed sewer



pipeline(associated with section 1 of the proposed sewer pipeline layout). The realignment will involve placing the pipeline to the west of the existing access road, this will in turn result in the disturbance of an area that has not been subjected to transformation at the level that the preferred site has been exposed to.

The proposed layout (preferred) will involve placing the proposed sewer pipeline within an existing access road as it follows an existing sewer line. The proposed layout (preferred) will make use of land that has been subject to human activity such as the existing sewer line and the use of the route as an access road by vehicles and pedestrians. The proposed layout(preferred) will have a low impact on the environment as compared to Layout Alternative 1, that proposes the disturbance of an area that has not been previously disturbed. The site for the proposed layout(preferred) is supported by the geotechnical specialist as the surrounding area has geological constraints related to soil instability.

Alternative 1 is not supported as it carries a greater economic cost to the proposed development and possess a great risk to the environment, for this reason, Alternative 1 is not supported.

Alternative 2

No-go (compulsory)

The proposed upgrading of the existing Serengeti pump station and the proposed construction of the sewer line from the Serengeti pump station to the connection at ERWAT forms part of the greater Eastern Outfall Sewer project initiated by the City of Ekurhuleni. The proposed project is in response to the current sanitation service delivery challenges experienced as the current sewage infrastructure cannot cope with the increased flows. The proposed project will provide and increase in the sanitation service capacity in the greater Kempton park area(east of the R21)

If the No-Go option was to occur then the current status of the sanitation services will persist and worsen over time as the existing infrastructure is already stressed with the current flows. Over time the situation will deteriorate and the risk of failure of the existing infrastructure will increase. The positive impacts associated with improved environmental conditions in terms of the prevention of sewage spills that have been observed as a result in the failure of the existing infrastructural sewage capacity will not be realised. The associated positive impacts such as the provision of adequate and efficient sewage infrastructure in the greater Kempton Park area will not occur.

The positive socio-economic impacts associated with the creation of employment opportunities, sourcing of local goods and services will not be realised. The provision and availability of efficient sanitation service provision is essential for economic growth and as such if the proposed project were not to go ahead then the future opportunities for economic growth in the Kempton park will be lost if the No-Go option is implemented.

6. Impact summary of the proposal or preferred alternative

For proposal:

A. Planning/pre-construction phase: Potential impacts, significance (pre- and post-mitigation) and mitigation measures.

Activity	Pre-mitigation	Post-mitigation
Risk of non-compliance with legal requirements of national and provincial legislation in terms of the proposed development .	Medium (Negative)	Low (Negative)



Risk of incorrect site layout.	Medium (Negative)	Low (Negative)
Shortage of municipal service supply for the proposed construction activities.	Medium (Negative)	Low (Negative)
Harm to the environment due to inadequate planning and design of the proposed development.	Medium (Negative)	Low (Negative)
Poor communication and lack of transparency of project information that may lead to conflict.	Medium (Negative)	Low (Negative)

B. Construction phase: Potential impacts, significance (pre- and post-mitigation) and mitigation measures

Activity	Pre-mitigation	Post-mitigation
Legislative requirements		
Non-compliance with legal requirements of the EA	Medium (Negative)	Low (Negative)
Development footprint		
Risk of construction activities occurring outside the development.	Medium (Negative)	Low (Negative)
Health and safety		
Risk of damage caused by fires on site.	Medium (Negative)	Low (Negative)
Health and safety risk that may arise and impact on the public and construction workers.	Medium (Negative)	Low (Negative)
Geology and soil		
Soil pollution due to hazardous chemical substances including fuel greases and oils used on site.	Medium (Negative)	Low (Negative)
Exposure to soil erosion.	Medium (Negative)	Low (Negative)
Fauna and flora		
The removal of vegetation will expose soils which may lead to soil erosion.	Medium (Negative)	Low (Negative)
Spread of alien invasive plant species from the transformed areas to the natural vegetation.	Medium (Negative)	Low (Negative)
Disturbance of sensitive vegetation.	Medium (Negative)	Low (Negative)
Damage to natural habitat due to construction activities and consequential displacement of faunal species.	Medium (Negative)	Low (Negative)
Loss of ecosystem function such as reduction in water quality, soil pollution and underground water contamination and the consequent negative impacts on faunal species.	Medium (Negative)	Low (Negative)
Disturbance of faunal species.	Medium (Negative)	Low (Negative)
Terrestrial ecology		
Loss of terrestrial habitat, diversity and species of conservation concern, caused from site preparation and vegetation clearing.	Medium (Negative)	Low (Negative)
Creation of access roads and the disturbance of the adjacent grasslands:	Medium (Negative)	Low (Negative)
Permanent to long-term loss of untransformed grassland, floristic richness and ecological condition (transformation from untransformed to secondary condition)	Medium (Negative)	Low (Negative)
Poor waste management on site.	Medium (Negative)	Low (Negative)
Freshwater Resources		
Risk of proposed activities occurring outside of the footprint of the existing Serengeti pump station (Located within the unnamed tributary of the Rietvlei river and associated floodplain wetland).	Medium (Negative)	Low (Negative)
Potential spills from the storage of hazardous goods	Medium (Negative)	Low (Negative)
Potential spills and leaks from vehicles delivering construction material (during refuelling of vehicles, leaks from hazardous material containers)	Medium (Negative)	Low (Negative)
Potential spills and leaks from onsite chemical toilets.	Medium (Negative)	Low (Negative)



Indiscriminate movement of vehicles within the freshwater resource.	Medium (Negative)	Low (Negative)
Clearing of vegetation during site preparations, and creating contractor laydown areas.	Medium (Negative)	Low (Negative)
Topsoil stockpiling adjacent to the freshwater resources.	Medium (Negative)	Low (Negative)
Potential indiscriminate waste disposal (disposal of waste material such as soil, rocks, concrete chemicals and litter within the freshwater resources)	Medium (Negative)	Low (Negative)
Department of Water and Sanitation Risk Assessment		
<u>Site clearing prior to commencement of construction activities:</u> Exposure of soils, leading to increased runoff and erosion, and thus increased sedimentation of the freshwater resources. Increased sedimentation of freshwater resources, leading to smothering of biota and potentially altering surface water quality. Decreased ecoservice provision.	Low (Negative)	Low (Negative)
<u>Ground-breaking, excavation of trench as part of the proposed upgrading of the existing Serengeti pump station and installation of the proposed rising main (within the unnamed tributary of the Rietvlei River):</u> Disturbances of soils leading to increased alien vegetation proliferation, and in turn to further altered freshwater habitat. Altered runoff patterns, leading to increased erosion and sedimentation of freshwater habitat.	Low (Negative)	Low (Negative)
<u>Potential indiscriminate waste disposal:</u> Altered flow regime as a result of solid wastes within the freshwater resources Altered water quality due to chemical waste disposal	Low (Negative)	Low (Negative)
<u>Potential spillage from construction vehicles:</u> Possible contamination of freshwater soils and surface water, leading to reduced ability to support biodiversity.	Low (Negative)	Low (Negative)
Groundwater		
Groundwater pollution due to unsanitary conditions on site.	Medium (Negative)	Low (Negative)
Groundwater pollution due to poor management and accidental spills of hazardous chemical substances including fuel, greases and oils used on site.	Medium (Negative)	Low (Negative)
Storm water management		
Surface runoff and associated sedimentation as a result of construction activities.	Medium (Negative)	Low (Negative)
Atmosphere and noise		
Ambient noise levels are likely to increase because of the construction activities.	Medium (Negative)	Low (Negative)
Degradation of ambient air quality due to dust and exhaust emission generation.	Medium (Negative)	Low (Negative)
Heritage and Palaeontology		
Construction activities may disturb or destroy sites, features or artefacts of archaeological and/or historical importance.	Low (Negative)	Low (Negative)
Construction activities may disturb or destroy fossils or bedrock of palaeontological sensitivity.	Low (Negative)	Low (Negative)
Social Impacts		
Traffic disturbances to commuters and local community as a result of road closures or construction activities occurring within the road reserve.	Low (Negative)	Low (Negative)
Risk associated with poor communication between landowners and the project team that may arise is conflict	Low (Negative)	Low (Negative)
Rehabilitation		
Construction activities may lead to the disturbance of the site and areas within the development footprint.	Low (Negative)	Low (Negative)

C. Operational Phase: Potential impacts, significance (pre- and post-mitigation) and mitigation measures



Activity	Pre-mitigation	Post-mitigation
Geology and soil		
Soil pollution due to hazardous chemical substances including fuel greases and oils used on site during the maintenance or spill event associated with the proposed project.	Medium (Negative)	Low (Negative)
Risk of soil erosion during maintenance activities that may be required for the proposed project.	Medium (Negative)	Low (Negative)
Fauna and flora		
Increased spread of alien and invasive plant species during the operational phase of the proposed development	Medium (Negative)	Low (Negative)
Freshwater resources		
Potential failure of infrastructure: possible leaks from pipeline into freshwater resources.	Medium (Negative)	Low (Negative)
Indiscriminate movement of vehicles and vegetation trampling within the freshwater resources during maintenance activities, resulting in soil compaction and disturbance, which could result in increased alteration of the vegetation community structure.	Medium (Negative)	Low (Negative)
Department of Water and Sanitation Risk Assessment		
<p><u>Operations and maintenance of proposed sewer pipeline and Serengeti pump station within (the unnamed tributary of the Rietvlei river and associated floodplain wetland.) and potential contamination of freshwater soils, groundwater and surface water.</u></p> <p>Vehicular access to the sewer pipeline resulting in:</p> <ul style="list-style-type: none"> - Soil compaction - Vegetation degradation - Soil and stormwater contamination from oils and Hydrocarbons <p>Contamination of the freshwater resources with additional sewage effluent resulting in:</p> <ul style="list-style-type: none"> - Increased concentration of salts, nitrate and toxic ammonia concentrations, as well as counts of <i>Escheria coli</i> <p>Potential eutrophication of the system, including anoxic conditions, leading to biodiversity simplification and the excess production of hydrogen sulphide gas as well as increased alien and invasive species encroachment.</p> <p>The installed infrastructure will be permanent and pose an increased risk over time in terms of the concrete weakening and cracking leading to leakages of the sewage. This may result in inputs of sewage effluent entering the freshwater system, and the following impacts:</p> <p>Increased concentration of salts, nitrate and toxic ammonia concentrations, as well as counts of <i>Escheria Coli</i>.</p> <p>Potential eutrophication of the system, including anoxic conditions, leading to biodiversity simplification and the excess production of hydrogen sulphide gas as well as increased alien and invasive species.</p>	Medium (Negative)	Low (Negative)
Terrestrial ecology		
Continued loss of terrestrial habitat, degradation of the terrestrial ecology and loss of potential species of conservation concern, by movement of vehicles during maintenance activities.	Medium (Negative)	Low (Negative)
Groundwater		
<p>Groundwater pollution due to maintenance activities undertaken for the proposed project. That may include:</p> <ul style="list-style-type: none"> - Potential spills as a result of failure in the sewage infrastructure due to poor maintenance. - Potential spills of hazardous chemical substances including fuel, greases and oils used on site during maintenance activities. 	Low (Negative)	Low (Negative)
Atmosphere and noise		
Ambient noise levels are likely to increase as a result of maintenance activities that may occur during the operational phase.	Low (Negative)	Low (Negative)
Socio-economic		
Creation of Jobs and transfer of skills.	High	High



	(Positive)	(Positive)
Sourcing of local goods and services.	High (Positive)	High (Positive)
Improved functioning of the sewage infrastructure in the greater Kempton Park area.	High (Positive)	High (Positive)
Increased capacity to deal with the anticipated future volumes of sewage as a result of development in the area.	High (Positive)	High (Positive)
Increased development and economic growth within area.	High (Positive)	High (Positive)

Having assessed the significance of impacts of the proposal and alternative(s), please provide an overall summary and reasons for selecting the proposal or preferred alternative.

The proposal is the preferred layout as all impacts identified as part of the proposed activity has been mitigated to low impact significance with mitigation. The proposal provides many positive socio-economic benefits with high (positive) impact significance, these impacts include:

- **Creation of Jobs and transfer of skills,**
- **Sourcing of local goods and services,**
- **Improved functioning of the sewage infrastructure in the greater Kempton Park, and**
- **Increased capacity to deal with the anticipated future volumes of sewage as a result of development in the area.**

Layout alternative 1 involves the realignment of approximately 434 m of the proposed sewer pipeline (associated with section 1). The realignment will involve placing the pipeline to the west of the existing access road and this will in turn result in the disturbance of an area that has not been subjected to level of transformation that the preferred site has been exposed to.

The proposed layout(Preferred) will have a low impact on the environment as compared to Layout Alternative 1 that proposes the disturbance of an area that has not been previously disturbed. The proposal is supported from an ecological and engineering perspective as outlined in the specialist report and has a low risk to the environment, for this reason the proposed layout is preferred.

7. Spatial development tools

Indicate the application of any spatial development tool protocols on the proposed development and the outcome thereof.

- **The City of Ekurhuleni Regional Spatial Development Framework Region B. The proposed activity is fully aligned with the provisions thereof;**
- **Gauteng Provincial EMF – The proposed activity will be located in the urban development zone and fully complies with the provisions thereof.**

8. Recommendation of the 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 as bound by professional ethical standards and the code of conduct of EAPASA).

YES	NO
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If "NO", indicate the aspects that require further assessment 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:

- Should it be necessary to clear any areas of vegetation, these areas, including contractor laydown areas, must remain as small as possible in order to reduce the risk of further proliferation of alien vegetation, and in order to retain a level of protection to the freshwater resource during construction (e.g. sediment trapping, slowing of storm water runoff etc.);
- Contractor laydown areas and all non-essential activities are to remain outside of the delineated freshwater resource zones and associated zone of regulation in terms of NEMA, and as much as feasible no natural/indigenous wetland vegetation is to be cleared. It is highly recommended that an alien vegetation management plan be compiled during the planning phase and implemented concurrently with the commencement of construction;
- A soil management plan must be compiled during planning and implemented when construction commences. It is essential that the following be included in the soil management plan:
- During trenching, no stockpiling of soils is to take place within the NEMA zone of regulation/GDARD buffer zone, and stockpiles may not exceed 2m in height;
- All exposed soils must be protected for the duration of the construction phase with a suitable geotextile (e.g. Grouted or hessian sheeting) in order to prevent erosion and sedimentation of the freshwater resources. This is particularly important since due to space constraints, it is not feasible to place the stockpiles a sufficient distance from the freshwater resource to prevent sedimentation of the resource;
- According to the construction method statement (City of Ekurhuleni; 2017), where feasible, material excavated during trenching for the laying of the proposed pipeline will be utilised as backfill. This must be carried out, and any soils which are not deemed suitable for use as backfill must be removed from site and disposed of at a registered landfill facility in accordance with applicable municipal by-laws and national waste management regulations; Any remaining soils following the completion of construction activities are to be levelled and re-seeded with indigenous floral species to minimise the risk of further sedimentation of the freshwater resource, and to aid in the natural reclamation process.
- All manholes located within the 1:100-year flood line must be constructed in such a way as to elevate the manhole cover above the 1:100-year flood level. This can be done by extending the collar of the manhole above the ground level and then building up a mound of appropriate soil around the manhole which is then sloped as gently as possible back to natural ground level;
- The pipeline must be encased in concrete along its entire length, and pressure tested for integrity upon the completion of construction;
- It is recommended that the managing authority test the integrity of the pipeline at least once every five years or more often should there be any sign or reports of a leak;
- Should a blockage occur all possible steps are to be taken to prevent the pollution of the watercourse during repair, including the placement of sheeting around the manhole used for access as well as containment barrels for any effluent withdrawn.
- Should any floral or faunal SCC be encountered during the site preparation or construction phase, the following measures are to be carried out;
- Ensure that the required permits are applied for from the competent authority prior to the removal of the species of conservation concern;
 - Where feasible, effective relocation of individuals to suitable similar habitat in the vicinity of the proposed pipeline;
 - All rescue and relocation plans should be overseen by a suitably qualified specialist;
 - It is recommended that operational activities take place in a phased manner, so as to ensure that as far as possible any faunal species can naturally disperse out of the area ahead of construction activities;
 - The construction footprint must be kept as small as possible in order to minimise impact on the surrounding environment;
 - Edge effects of activities need to be actively managed to minimise further impacts to the receiving environment, with specific consideration to erosion control and alien floral species management;
 - Restrict vehicles to travelling only on designated roadways to limit the ecological footprint;
 - No uncontrolled fires whatsoever should be allowed;
 - No dumping of waste should take place. If any spills occur, they should be immediately cleaned up;
 - In the event of a breakdown, maintenance of vehicles must take place with care and the recollection of spillage should be practiced preventing the ingress of hydrocarbons into the topsoil;



- No trapping or hunting of any faunal species is to take place;
- Alien vegetation must be removed from the proposed pipeline route during both the construction and operational phases, in line with the NEMBA Alien and Invasive Species Regulations (2016);
- Disturbed and cleared areas need to be revegetated with a grassveld reclamation mixture (www.Mayford.co.za/1548-2) to help stabilise the soil surface;
- All alien plants along the proposed pipeline should be cleared, with follow up activities running concurrently for two years; and
- Soils that have been compacted must be ripped and profiled in line with the surrounding area.



9. The needs and desirability of the proposed development

(as per notice 792 of 2012, or the updated version of this guideline)

Guideline on Need and Desirability (March 2013) as well as the GN 891 of 2014 integrated environmental management guideline series 9 guidelines on need and desirability in terms of the 2014 EIA regulations as published on the 20th of October 2014.)

Requirement	Part where requirement is addressed/response
<p>1. <i>How will this development (and its separate elements/aspects) impact on the ecological integrity of the area?</i></p>	<p>The proposed sewer line as part of section 1 (point 1-3) starts from the existing Serengeti pump station (Point 1) and as mentioned above this area is located within an unnamed tributary of the Rietvlei river and associated floodplain wetland. Point 2-3 of the proposed sewer line is located within a CBA area as indicated in figure 8 of the SAS report as mentioned above.</p> <p>This section of the proposed pipeline is approximately 434 m and forms part of an Ecological Assessment by Pachnoda Consulting dated June 2018. The reports indicated that surrounding environment for section 1 (Points 1-3) of the proposed pipeline route consist of the following characteristics:</p> <ul style="list-style-type: none"> • Untransformed Carletonville dolomite grassland (Untransformed)- 34.49% • Semi-transformed Carletonville dolomite grassland(Semi-transformed)-14.65% • Secondary Carletonville dolomite grassland(Degraded)-18.92% • Infrastructure (transformed)-31.94% <p>Alien vegetation observed along section 1 as per the Ecological Assessment Report by Pachnoda indicated that only declared weed and invader species was observed during the site visit, Solanum sisymbriifolium. It is a Category 1b species that was observed from the semi-transformed and secondary Carletonville Dolomite Grassland. Tecoma stans (Category 1b) and Ailanthus altissima (Category 1b) were observed from nearby discarded building rubble alongside the perimeter of the pump station</p> <p>The proposed project will have a low impact on the environment as assessed in Section E above.</p>
<p>How were the following ecological integrity considerations considered?</p>	
<p>1.1.1 <i>Threatened ecosystems.</i></p>	<p>No threatened ecosystems has been identified within the proposed project site.</p>
<p>1.1.2 <i>Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.</i></p>	<p>The proposed route associated with Section 1(Points 1-3) is located within the Dry Highveld Grassland Ecoregion as indicated in Figure 3 of the SAS Freshwater Resource Assessment dated August 2017. Section 1 of the proposed project is located within a sensitive area as it is situated within a CBA as indicated in Figure 8 of the above-mentioned report. This section of the proposed pipeline is approximately 434 m and forms part of an Ecological Assessment by Pachnoda Consulting dated June 2018. The reports indicated that surrounding environment for section 1 (Points 1-3) of the proposed pipeline route consist of the following characteristics:</p> <ul style="list-style-type: none"> • Untransformed Carletonville dolomite grassland (Untransformed)- 34.49% • Semi-transformed Carletonville dolomite grassland(Semi-transformed)-14.65% • Secondary Carletonville dolomite grassland(Degraded)-18.92% • Infrastructure (transformed)-31.94%



Requirement	Part where requirement is addressed/response
	<p>The proposed upgrading activities that will form part of the existing Serengeti Pump station (Point 1) are located within a watercourse as the existing Serengeti Pump station is located within an unnamed tributary of the Rietvlei river and associated floodplain wetland as indicated in figure 11 of the SAS Freshwater Resource Assessment dated August 2017.</p> <p>A summary of the current state of the wetlands identified within the proposed project site (proposed upgrading of the Serengeti pump station as well as a small section of the proposed rising main) has been provided below:</p> <p><u>Unnamed tributary of the Rietvlei River with associated floodplain wetland:</u></p> <p><u>PES:</u> Instream impacts according to the instream IHI assessment revealed impacts in terms of nutrient enrichment, mostly related to agricultural activities, but also some bed modification due to the large influx of sediment into the system. However, modifications to the banks of this river are not considered serious, with only localised impacts (road crossings) at certain areas of this portion of the tributary. Thus, overall, the instream integrity of this tributary may be regarded as being in a PES Category C. The riparian zone impacts include alteration of the vegetation in both the marginal and non-marginal zones, whereby some vegetation removal and invasion of alien invasive species has occurred. Therefore, the riparian zone integrity of this tributary may also be regarded as a PES Category C.</p> <p><u>Ecosystem functioning:</u> Despite the modifications to the system and therefore the lowered ecological integrity thereof, the system is deemed to provide intermediate levels of ecological functioning, particularly flood attenuation and streamflow regulation. Biodiversity maintenance is also considered an important provision by the system, mainly due to the vegetation structure being able to provide suitable habitat for a variety of species. However, the system is not considered to have significant value in terms of direct benefits to the community such as provisioning of water for domestic use or notable tourism value.</p> <p><u>Water quality:</u> The water quality of this tributary is not considered to be severely impaired despite the probability of enriched surface runoff originating from upgrading agricultural fields and trampling of livestock through the tributary. However, water from a tributary which flows through the Serengeti Golf and Lifestyle Estate has a white foam on the surface, indicating that upstream influences decreases the quality of water entering the Rietvlei River system.</p> <p><u>Geomorphology and sediment balance:</u> The increased volume of water within this tributary has caused increased erosion of the banks of the active channel, scouring the banks and therefore causing an increase in the sediment load of this tributary. This sediment has been deposited along the river bank. Additional sediment inputs originate from the adjacent agricultural fields, especially after harvesting of crops when these areas are left bare.</p>



Requirement	Part where requirement is addressed/response				
	<p>Habitat and biota: The vegetation component of this portion of the tributary, mainly within the floodplain area, is dominated by undesirable and invasive reed species (<i>Phragmites australis</i> and <i>Typha capensis</i>). The sediment substrate allowed for the invasion of a monoculture of <i>Phragmites australis</i>, dominating the extent of the floodplain, reducing the available substrate for other indigenous species to establish. Due to this monoculture, floral biodiversity is low, but this area still has the potential to provide habitat for other faunal species. Some proliferation of alien and invasive floral species was also evidenced at the outer edges of the floodplain area, and where infrastructure (road crossings) has been constructed.</p> <p>EIS Category: B (High): The EIS of this portion of the tributary falls within Category B, which are features that are considered to be ecologically important and sensitive. This is mainly because this tributary is considered to be CBA with an ESA buffer by the Gauteng Conservation Plan (2014).</p> <p>REC Category: C (Moderately modified): Despite the relatively high ecological importance of this portion of the tributary, this system has seen a variety of historical impacts, resulting in the degradation of the system to some degree. Thus, further degradation of the river should not be permitted. Mitigation measures should be implemented during all phases of the proposed sewer pipeline development to minimise the risk of further negative impacts to the receiving environment, and wherever possible, to improve the conditions of the portion of the tributary associated with the development.</p>				
<p>1.1.3 <i>Critical Biodiversity Areas ("CBAs") and Ecological Support Areas ("ESAs").</i></p>	<p>The proposed project is located within the Highveld Ecoregion as indicated in Figure 3 of the SAS Freshwater Resource Assessment dated August 2017. The northern section of the proposed sewer line is situated within a CBA as indicated in Figure 8 of the above-mentioned report.</p>				
<p>1.1.4 <i>Conservation targets.</i></p>	<p>The proposed project traverses the Mesic Highveld Grassland (Group 3) as indicated in Figure 7 of the SAS Freshwater Resource Assessment dated August 2017.</p> <table border="1" data-bbox="721 948 2024 1038"> <thead> <tr> <th data-bbox="721 948 1370 976">Vegetation type</th> <th data-bbox="1370 948 2024 976">Conservation targets</th> </tr> </thead> <tbody> <tr> <td data-bbox="721 976 1370 1038">Eastern Highveld Grassland Endangered.</td> <td data-bbox="1370 976 2024 1038">Target 24%. Only a very small fraction is conserved in statutory.</td> </tr> </tbody> </table>	Vegetation type	Conservation targets	Eastern Highveld Grassland Endangered.	Target 24%. Only a very small fraction is conserved in statutory.
Vegetation type	Conservation targets				
Eastern Highveld Grassland Endangered.	Target 24%. Only a very small fraction is conserved in statutory.				
<p>1.1.5 <i>Ecological drivers of the ecosystem.</i></p>	<p>The ecological drivers of the greater ecosystem are an unnamed tributary of the Rietvlei River and floodplain wetland located to the North of the proposed pipeline route. The EIS of this portion of the tributary falls within Category B, which are features that are considered to be ecologically important and sensitive. This is mainly because this tributary is considered to be a CBA with an ESA buffer by the Gauteng Conservation Plan (2014).</p>				



Requirement	Part where requirement is addressed/response
<p>1.1.6 <i>Environmental Management Framework.</i></p>	<p>The proposed project forms part of the greater Pomona Eastern Outfalls Sewer. The greater Kempton park area currently faces a sewage capacity challenges as the existing sewage infrastructure is under great stress .</p> <p>Addressing the above-mentioned challenges is of vital importance as per the South African constitution; sanitation is dignity. The proposed project provides a proactive solution to the current and future challenges associated with the provision of adequate and efficient sanitation services. The proposed project is aligned with the anticipated developmental growth within the City of Ekurhuleni (COE).</p> <p>The proposed project is aligned within the scope of the City of Ekurhuleni Environmental Management Framework especially in terms of water quality as well as the protection and conservation of areas that are sensitive from an ecological and hydrological perspective. The proposed development of the sewer pipeline will result provide positive impacts to the surrounding environment, especially the degraded tributary of the Rietvlei river and associated flood plain wetland as the existing Serengeti pump station has experienced sewage leaks and overflows. The proposed project will allow for improved operation of the sewage infrastructure in the area as it will allow for the systems to deal with the current and future sewage capacity. The proposed project forms part of a larger scheme for the improved sanitation within the City of Ekurhuleni, which will not only improve sanitation and the living standards for a number of the previously disadvantaged community, but also support economic growth and social development goals within the City of Ekurhuleni.</p>
<p>1.1.7 <i>Spatial Development Framework(SDF).</i></p>	<p>Kempton Park falls within the Regional Spatial Development Framework (RSDF): Region B, both areas have been identified as urban development nodes as per the SDF.</p> <p>The RSDF states that Region B has sufficient capacity to accommodate future expansion in terms of sewage infrastructure as the major constraints to development in the region is the overstressed capacities of the Waste Water Treatment Plants (WWTP). There are backlogs on the maintenance of the existing sewer infrastructure, and as a result the lack in infrastructure in the east limits the growth and development of the region.</p> <p>The RSDF Development Strategy addresses bulk infrastructure and aims to ensure a sustainable and liveable living environment by addressing the capacity and backlog of the bulk infrastructure needs. The plan of action that has been identified within the regional SDF starts with the development of bulk infrastructure that will be able to cater for the future development of the region (especially in the R21 development corridor).</p> <p>The proposed Pomona/Serengeti/Hartbeesfontein link is a R130 million project with a 3 to 4-year implementation period and is located within the R21 corridor is a priority area for development as outlined in the regional SDF and there are currently numerous township applications being submitted for the surrounding area. The further development of the entire area is hampered by the lack of infrastructure and the proposed development will act as a catalyst for future development. Numerous townships are envisaged for the area but are delayed by the limited capacity of existing infrastructure.</p> <p>The proposed project is aligned with the objectives of the Regional SDF as it aims to address the challenges associated with bulk</p>



Requirement	Part where requirement is addressed/response
	infrastructural needs as the proposed development forms part of the greater Eastern Outfall Sewer project initiated by the City of Ekurhuleni.
1.1.8 <i>Global and international responsibilities relating to the environment (e.g. RAMSAR sites, Climate Change, etc.).</i>	Not applicable.
1.2 <i>How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity? What measures were explored to firstly avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?</i>	<p>The proposed project will be within existing servitudes with most of the proposed route following the existing pipeline route within the existing access roads. This habitat is considered to be of a moderately low sensitivity, due to past and current impacts and edge effects from the local peri urban and agricultural areas.</p> <p>The upgrading activities will occur within the existing Serengeti pump station that is historically located within an unnamed tributary of the Rietvlei River and associated floodplain wetland. The proposed upgrading activities will improve the current functioning of the pump station and lead to a reduced risk of infrastructure failure due to capacity constraints.</p> <p>Due to the existing informal road crossing over this portion of the tributary, and assuming that the construction will be well planned and good construction practices will take place. The results of the risk assessment indicate that during construction, impacts are likely to be of low levels. The ecological study indicated that due to the small extent of the proposed pipeline there will be localised impacts of low significance on the adjacent grassland units.</p> <p>The proposed development will in essence improve the environmental conditions of the area and enhance the ecosystem as it will have a positive impact that are both direct and cumulative. The proposed project will alleviate the stress placed on the Serengeti pump station and prevent the current sewage spills from occurring as well as reduce the cumulative risk of sewage spills that may occur in the future.</p>
1.3 <i>How will this development pollute and/or degrade the biophysical environment? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?</i>	<p>Strict mitigation measures will be imposed on the development to avoid pollution. Positive impacts associated with the proposed development will be the provision of adequate and efficient sewage infrastructure in the greater Kempton Park areas. The proposed development will complement the anticipated growth as part of the R21 corridor and development goals for Region B as per the SDF. The proposed development will lead to GPD growth as it will result in the creation of employment opportunities as well as the sourcing of local goods and services as part of the proposed development.</p>
1.4 <i>What waste will be generated by this development? What measures were explored to firstly avoid waste, and where waste could not be avoided altogether,</i>	<p>Only a small amount of construction waste will be generated during the construction phase of the proposed project. The construction waste will be disposed of at a suitably licensed/ registered disposal facility. During the construction, wastes will be separated at source and disposed at a registered/licensed facility. Waste will be separated into recyclable and non-recyclable materials and distributed for recycling where applicable. To ensure optimal material reuse, construction waste will be used as fill material and as foundation for the</p>



Requirement	Part where requirement is addressed/response
<p><i>what measures were explored to minimise, reuse and/or recycle the waste? What measures have been explored to safely treat and/or dispose of unavoidable waste?</i></p>	<p>proposed processes where possible. In such a case, re-use of construction waste materials will minimise the amount of waste that will need to be disposed of at registered municipal waste facilities. Only inert, non-hazardous construction material will be re-used.</p>
<p>1.5 <i>How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?</i></p>	<p>This development will not impact on the landscapes and nations cultural heritage.</p>
<p>1.6 <i>How will this development use and/or impact on non-renewable natural resources? What measures were explored to ensure responsible and equitable use of the resources? How have the consequences of the depletion of the non-renewable natural resources been considered? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?</i></p>	<p>The activity will not impact on renewable natural resources.</p>
<p>1.7 <i>How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part? Will the use of the resources and/or impact on the ecosystem jeopardise the integrity of the resource and/or system taking into account carrying capacity restrictions, limits of acceptable change, and</i></p>	<p>The activity will not impact on renewable natural resources.</p>



Requirement	Part where requirement is addressed/response
<p><i>thresholds? What measures were explored to firstly avoid the use of resources, or if avoidance is not possible, to minimise the use of resources? What measures were taken to ensure responsible and equitable use of the resources? What measures were explored to enhance positive impacts?</i></p>	
<p>1.7.1 <i>Does the proposed development exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e. de-materialised growth)? (note: sustainability requires that settlements reduce their ecological footprint by using less material and energy demands and reduce the amount of waste they generate, without compromising their quest to improve their quality of life)</i></p>	<p>Not applicable.</p>
<p>1.7.2 <i>Does the proposed use of natural resources constitute the best use thereof? Is the use justifiable when considering intra- and intergenerational equity, and are there more important priorities for which the resources should be used (i.e. what are the opportunity costs of using these resources this the proposed development alternative?)</i></p>	<p>The activity will not impact on non-renewable natural resources.</p>
<p>1.7.3 <i>Do the proposed location, type and scale of development promote a reduced dependency on resources?</i></p>	<p>Not applicable.</p>
<p>1.8 <i>How were a risk-averse and cautious approach applied in terms of ecological impacts?</i></p>	<p>The proposed project has been assessed in terms of direct, indirect and cumulative impacts that may arise as part of the proposed activities. The impacts were assessed in terms of environmental, social and economic aspects that may relate to the proposed development. The impacts identified have been assigned a significance rating as well as proposed mitigation measures that will form part of the proposed development.</p>



Requirement	Part where requirement is addressed/response
	Further risk assessment in terms of fresh water and ecological impacts have been addressed as a freshwater and ecological assessment for the proposed site has been conducted by specialists. A risk assessment for the aquatic resources forms part of the aquatic specialist report by SAS. All specialist recommendations and mitigation measures form part of this report as well as the Environmental Management Programme for the proposed project.
<p>1.8.1 <i>What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?</i></p>	<p><u>The following assumptions and limitations are applicable to the Freshwater Resource Assessment conducted by SAS (August 2017):</u></p> <ul style="list-style-type: none"> • The determination of the freshwater resource boundaries and the assessment thereof, is confined to the freshwater resources traversed by, or within 50m of, the proposed sewer pipeline. All freshwater resources identified within 500m of the proposed sewer pipeline were delineated in fulfilment of Regulation GN509 of the NWA on a desktop level, however these resources were not assessed individually. The general surroundings were considered in the desktop assessment of the proposed sewer pipeline. • Some areas within the study area have undergone significant anthropogenic influences (road construction, excavations) which have altered the soil profiles and vegetation composition, as a result, identification of the outer boundary of the temporary zone of some freshwater resources proved difficult in some areas. Therefore, the freshwater resource delineations as presented in this report are regarded as a best estimate of the boundaries based on the site conditions present, as observed during the site assessment. Global Positioning System (GPS) technology is inherently inaccurate and some inaccuracies due to the use of handheld GPS instrumentation may occur. If more accurate assessments are required, the freshwater resource boundaries will need to be surveyed and pegged according to surveying principles. • Due to the season in which the site assessment was undertaken (winter period) and some areas of the freshwater resources subjected to seasonal fires, some floral species may not have been identified, as many of these species will have entered a period of dormancy, or alternatively have come to the end of the flowering period. Therefore, the use of vegetation species in aid of the delineation of freshwater resources proved to be limited in certain areas. • Freshwater and terrestrial zones create transitional areas where an ecotone is formed as vegetation species change from terrestrial to obligate/facultative species. Within this transition zone, some variation of opinion on the freshwater resource boundary may occur. However, if the DWAF (2008) method is followed, all assessors should get largely similar results; and with ecology being dynamic and complex, certain aspects (some of which may be important) may have been overlooked. However, it is expected that the proposed development activities have been accurately assessed and considered, based on the field observations and the consideration of existing studies and monitoring data in terms of riparian and wetland ecology.
<p>1.8.2 <i>What is the level of risk associated with the limits of current knowledge?</i></p>	The risk is that GDARD might request a spring or summer study for the Aquatic Assessment Report.
<p>1.8.3 <i>Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?</i></p>	All specialist studies were conducted by registered and certified specialists in their fields. The mitigation measures proposed by the specialists will be considered by the client.
<p>How will the ecological impacts resulting from this development impact on people's environmental right in terms following:</p>	



Requirement	Part where requirement is addressed/response
<p>1.8.4 <i>Negative impacts: e.g. access to resources, opportunity costs, loss of amenity (e.g. open space), air and water quality impacts, nuisance (noise, odour, etc.), health impacts, visual impacts, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?</i></p>	<p>Please refer to Section E of this report for the Impact Assessment for the identified environmental impacts associated with the proposed development and associated activities.</p>
<p>1.8.5 <i>Positive impacts: e.g. improved access to resources, improved amenity, improved air or water quality, etc. What measures were taken to enhance positive impacts?</i></p>	<p>Please refer to Section E of this report for the Impact Assessment for the identified environmental impacts associated with the proposed development and associated activities.</p>
<p>1.9 <i>Describe the linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area in question and how the development's ecological impacts will result in socio-economic impacts (e.g. on livelihoods, loss of heritage site, opportunity costs, etc.)?</i></p>	<p>Refer to section E for identified environmental impacts associated with the activity.</p>
<p>1.10 <i>Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives/targets/considerations of the area?</i></p>	<p>Refer to section E for identified environmental impacts associated with the activity.</p>
<p>1.11 <i>Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the "best practicable environmental option" in terms of ecological considerations?</i></p>	<p>Refer to section E for identified environmental impacts associated with the activity.</p>
<p>1.12 <i>Describe the positive and negative</i></p>	<p>Refer to section E for identified environmental impacts associated with the activity.</p>



Requirement	Part where requirement is addressed/response
<p><i>cumulative ecological/biophysical impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and existing and other planned developments in the area?</i></p>	
<p>What is the socio-economic context of the area, based on, amongst other considerations, the following considerations?</p>	
<p>2.1.1 <i>The IDP (and its sector plans' vision, objectives, strategies, indicators and targets) and any other strategic plans, frameworks of policies applicable to the area,</i></p>	<p>The Integrated Development Plan (IDP) for the City of Ekurhuleni 2017/18 to 2020/21, states that the COE is experiencing a backlog in the provision of basic services. The COE IDP (2017/18 to 2020/21) sets a 'pro Poor' agenda that focuses on; Short and medium-term priorities that are meant to support improved and impactful service delivery; and accelerating and broadening access to quality municipal services to the poor while maintaining quality service levels in affluent areas.</p> <p>The following Strategic Objectives are linked to the proposed project: <u>Strategic Objective 1: To promote integrated human settlements through massive infrastructure and services roll out.</u> This Strategic Objective seeks to promote integrated human settlements by ensuring universal access to basic services. National Government categorizes water, sanitation, waste removal and electricity as basic services.</p> <p><u>Strategic Objective 5: To create an enabling environment for inclusive growth and job creation.</u> The success of the social and economic transformation agenda depends on the continuous renewal of social and technical infrastructure, which in turn requires that investment be attracted and retained. An enabling climate for investment is critical for economic growth and social development. For this reason, the City will implement the 10-point economic plan, as part of the Gauteng Province Radical Economic Transformation Agenda inclusive of Massive infrastructure investment that will accelerate and broadening access to quality municipal services to the poor while maintaining quality service levels in affluent areas.</p> <p>The proposed project meets the Strategic Objectives 1 and 5 of the City of Ekurhuleni IDP. The proposed development of the sewer line will provide adequate and efficient sanitation services to the surrounding areas as well as the greater community as the proposed development forms part of the larger municipal Eastern Outfall Sewer project. This will improve service delivery and create employment opportunities in the construction phase of the proposed development. The proposed development will act as a catalyst for development as the continuous renewal of social infrastructure is vital for economic growth and social development.</p>
<p>2.1.2 <i>Spatial priorities and desired spatial patterns (e.g. need for integration of segregated communities, need to upgrade informal settlements, need for densification, etc.),</i></p>	<p>The challenge faced in terms of the provision of sanitation services comes from the existing sanitation infrastructure that does not have the capacity to deal with the current sewage flows and the anticipated future flows.</p> <p>Addressing the above-mentioned challenges is of vital importance as per the South African constitution; sanitation is dignity. The proposed project provides a proactive solution to the current and future challenges associated with the provision of adequate and efficient sanitation services. The proposed sewer pipeline will result in an improvement in service delivery in the area that will result in the promotion of growth and development in the area. The improved sewage capacity in the area will accommodate for the</p>



Requirement	Part where requirement is addressed/response
	communities current needs as well as the anticipated future growth of the area and has been identified as a development node as per the regional SDF (Region B). Thus, the proposed development falls within the spatial priorities of the area.
2.1.3 <i>Spatial characteristics (e.g. existing land uses, planned land uses, cultural landscapes, etc.), and</i>	The majority of the proposed project site will be located within existing informal access roads. The proposed upgrading of the existing Serengeti pump station will occur within an unnamed tributary of the Rietvlei river and associated flood plain wetland. The existing land use is characterised by the light industrial areas, open veld and existing sewage infrastructure (ERWAT WWTW and the Serengeti Pump station).
2.1.4 <i>Municipal Economic Development Strategy ("LED Strategy").</i>	It is the mandate of the City of Ekurhuleni to ensure universal access to basic services. National Government categorises water, sanitation, waste removal and electricity as basic services. Access to sanitation is dignity and a basic right. The proposed project will act as a catalyst for development as the continuous renewal of social infrastructure is vital for economic growth and social development.
2.2 Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate elements/aspects), and specifically also on the socio-economic objectives of the area?	The proposed project will result in positive socio-economic impacts that relate to: Meeting the development goals as identified in both the regional SDF and the City of Ekurhuleni 's IDP in terms of improving the provision adequate and efficient sanitation services to the surrounding areas as well as the greater community. This will improve service delivery and create employment opportunities in the construction phase of the proposed development where there will be a generation of employment and technical skills transfer to the local communities during the construction phase of the project.
2.2.1 <i>Will the development complement the local socio-economic initiatives (such as local economic development (LED) initiatives), or skills development programs?</i>	Yes, the proposed project will create employment opportunities within the construction phase of the development that will include skills transfer with the local community. Goods and services for the proposed development will be sourced locally and this in turn will create positive impacts on Local Economic Developments. The proposed development will act as a catalyst for development as the continuous renewal of social infrastructure is vital for economic growth and social development.
2.3 How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?	The proposed development followed a Public Participation Process(PPP) as per the NEMA 2014 EIA Regulations and as mentioned the Public Participation Process for this project was conducted by Shangoni Management Services. The PPP was conducted in an inclusive and transparent manner and the following legislation and guidelines were adapted: <ul style="list-style-type: none"> • Chapter 6 of the 2014 EIA Regulations; • GN 807 of 2012; Public Participation Guideline; • Guideline on Need and Desirability, Department of Environmental Affairs DEA (2017); • Other relevant legislation such as the Promotion of Access to Information Act (PAIA), 2000. Section 9 of this report has assessed the proposed project in terms of the needs and desirability of the proposed activity and the subsequent impact on the proposed development site and the surrounding areas. The specialist studies have provided mitigation measures and recommendations that should be adopted to minimise negative impacts, as well as recommendations to enhance



Requirement	Part where requirement is addressed/response
	<p>positive impacts.</p> <p>The proposed project is part of the greater Eastern Sewer Outfall project initiated by the City of Ekurhuleni and the proposed pipeline is in the interest of the greater community.</p>
<p>2.4 Will the development result in equitable (intra- and inter-generational) impact distribution, in the short- and long term? Will the impact be socially and economically sustainable in the short- and long-term?</p>	<p>The proposed project will allow for improved operation of the sewage infrastructure in the area as it will allow for the systems to deal with the current and future sewage capacity. The pipeline project forms part of a larger scheme for the improved sanitation within the City of Ekurhuleni, which will not only improve sanitation and the living standards for a number of the previously disadvantaged community, but also support economic growth and social development goals within the City of Ekurhuleni.</p> <p>It must be noted that with adequate mitigation, there are no clear reasons to suspect that the project would be unsustainable</p>
<p>2.4.1 Result in the creation of residential and employment opportunities in close proximity to or integrated with each other,</p>	<p>The development will result in the creation of employment opportunities for local residents as approximately 100 new employment opportunities will be created in the construction phase of the proposed development of the sewer pipeline.</p>
<p>2.4.2 Reduce the need for transport of people and goods,</p>	<p>NO, the proposed development is for the construction of sewage infrastructure and as such the development will not involve the transportation of people and goods.</p>
<p>2.4.3 Result in access to public transport or enable non-motorised and pedestrian transport (e.g. will the development result in densification and the achievement of thresholds in terms public transport).</p>	<p>No, the proposed development is for the construction of sewage infrastructure and as such the development will not involve access to public transport or enable non-motorised and pedestrian.</p>
<p>2.4.4 Compliment other uses in the area,</p>	<p>The Serengeti pump station services the Serengeti estate and will be upgraded to accommodate sewage flows from the greater Pomona and Glen Marias areas as it allow for sewage flows directly into the Hartbeesfontein WWCW catchment area's sewer network, which drains to the Hartbeesfontein WWCW via a gravity-feed main outfall sewer.</p> <p>The proposed project will address the current and future sewage infrastructural demands associated with the anticipated growth in the area. The proposed development compliments the current land use of the area as well as the proposed growth plans as identified within the municipalities regional Spatial Development Framework.</p>
<p>2.4.5 Be in line with the planning for the area,</p>	<p>The proposed project is in line with the objectives of the regional Spatial Development Framework(SDF) as well as the goals outline in the municipalities IDP.</p> <p>Please refer to Section 2.1.1, 2.1.2, 2.1.3 and section 2.1.4 above.</p>
<p>2.4.6 For urban related development, make use of underutilised land available with the urban edge,</p>	<p>The proposed project will make use of land available as well as existing infrastructure in terms of the road reserves, registered servitudes and the existing tie in connection to the ERWAT WWTW.</p>



Requirement	Part where requirement is addressed/response
2.4.7 <i>Optimise the use of existing resources and infrastructure</i>	The proposed project will be constructed within the existing access roads. The proposed development will make use of the existing infrastructure in terms of the road reserves, registered servitudes and the existing tie in connection to the ERWAT WWTW.
2.4.8 <i>Consider opportunity costs in terms of bulk infrastructure expansions in non-priority areas (e.g. Not aligned with the bulk infrastructure planning for the settlement that reflects the spatial reconstruction priorities of the settlement).</i>	The proposed project will allow for increased capacity and efficient sewage service provision in the greater Kempton Park area as it forms part of the greater Pomona Easter Outfall Sewer. The proposed project forms part of the greater scheme of bulk sewage service provision that is aligned with the municipal goal as outlined above. The increased sewage service provision and upgrading of the existing infrastructure will act as a catalyst for future development that is projected for the area.
2.4.9 <i>Discourage "urban sprawl" and contribute to compaction/densification.</i>	The manner of the development will not encourage migration urban sprawl but rather support planned development within the greater community. Please refer to Section 2.1.1, 2.1.2, 2.1.3 and section 2.1.4 above.
2.4.10 <i>Contribute to the correction of the historically distorted spatial patterns of settlements and to the optimum use of existing infrastructure in excess of current needs,</i>	The development of this area is of great importance and the proposed project will assist in improving basic services, providing reliable sanitation services and employment creation to the previously disadvantaged local communities as part of the National Development Plan.
2.4.11 <i>Encourage environmentally sustainable land development practices and processes,</i>	The proposed project is the best practicable environmental option as it is a replacement of the existing sanitation infrastructure that cannot cope with the sanitation demand of the area. The proposed pipeline route occurs within transformed environments, within existing servitudes and built up areas. The proposed project will address the current sanitation problems and minimise the long-term risk associated with environmental degradation. The proposed development of the sewer pipeline will provide positive benefits to the environment.
2.4.12 <i>Take into account special locational factors that might favour the specific location (e.g. The location of a strategic mineral resource, access to the port, access to rail, etc.),</i>	The project is located strategically as it involves the upgrading of an existing pump station and will follow an existing sewer line layout. The proposed project is located in close proximity to the ERWAT WWTW as it forms part of one of the many branches that will direct sewage flows to the ERWAT WWTW.
2.4.13 <i>Result in the investment in the settlement or area in question will generate the highest socio-economic returns (i.e. An area with high economic potential),</i>	<p>The proposed project will create employment opportunities within the construction phase of the development that will include skills transfer with the local community. Goods and services for the proposed development will be sourced locally and this in turn will create positive impacts on Local Economic Development (LED).</p> <p>The proposed development will act as a catalyst for development as the continuous renewal of social infrastructure is vital for economic growth and social development.</p>
2.4.14 <i>Impact on the sense of history, sense of place and heritage of the area and the</i>	The development will not impact any area of historical significance.



Requirement	Part where requirement is addressed/response
<i>socio-cultural and cultural-historic characteristics and sensitivities of the area, and</i>	
2.4.15 <i>In terms of the nature, scale and location of the development promote or act as a catalyst to create a more integrated settlement?</i>	It is the mandate of the City of Ekurhuleni to ensure universal access to basic services. National Government categorises water, sanitation, waste removal and electricity as basic services. Access to sanitation is dignity and a basic right. The proposed development will act as a catalyst for development as the continuous renewal of social infrastructure is vital for economic growth and social development.
How were a risk-averse and cautious approach applied in terms of socio-economic impacts?	
2.4.16 <i>What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?</i>	Throughout the impact assessment, a cautious approach was followed whereby listed activities in GN. R 983 and R985 were identified based on the precautionary principle.
2.4.17 <i>What is the level of risk (note: related to inequality, social fabric, livelihoods, vulnerable communities, critical resources, economic vulnerability and sustainability) associated with the limits of current knowledge?</i>	In relation to inequality, vulnerable communities and economic vulnerability, no risk was identified. In terms of the employment opportunities created, 100 percent of the construction workers employed will be from previously disadvantaged groups and 53% of those will be women.
2.4.18 <i>Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?</i>	The specialist studies conducted provides mitigation measures and recommendations that should be adopted to minimise negative impacts, as well as recommendations to enhance positive impacts. The specialist study notes the gaps, limits in current knowledge and assumptions that the assessments are based on. Please refer to Section 1.8.1 above.
How will the socio-economic impacts resulting from this development impact on people's environmental right in terms following:	
2.4.19 <i>Negative impacts: e.g. health (e.g. HIV-Aids), safety, social ills, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?</i>	The proposed project will result in positive social impacts associated with the provision of adequate and efficient sanitation services to the Kempton Park community and other surrounding areas. No negative socio-economic impacts have been identified as part of the impact assessment for the proposed development.
2.4.20 <i>Positive impacts. What measures were taken to enhance positive impacts?</i>	The proposed project will result in positive socio-economic impacts as well as produce a positive outcome for the environment and the surrounding community. The following positive impacts have been identified: <ul style="list-style-type: none"> • Provision of basic services to the greater community



Requirement	Part where requirement is addressed/response
	<ul style="list-style-type: none"> • Improved operation of the sanitation infrastructure within the greater community. • The improved health status of the wetland unit as the risk of sewage spills will be mitigated. • Promotion of good health practices within the community. • Employment opportunities will be generated during the construction, new business opportunities will be encouraged. <p>The development of this area is of great importance such that the proposed project will assist in providing water services which will ultimately improve sanitation and create employment to the previously disadvantaged local communities as part of the National Development Plan.</p>
<p>2.5 <i>Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socioeconomic impacts will result in ecological impacts (e.g. Over utilisation of natural resources, etc.)?</i></p>	<p>The linkages between the proposed project, socio-economic impacts and the ecological impacts are positive in nature as the proposed upgrading of the Serengeti pump station will reduce the risk of sewage spills that is currently occurring at the pump station due to lack of capacity.</p>
<p>2.6 <i>What measures were taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations?</i></p>	<p>The specialist studies conducted provides mitigation measures and recommendations that should be adopted to minimise negative impacts, as well as recommendations to enhance positive impacts. The specialist study notes the gaps, limits in current knowledge and assumptions that the assessments are based on.</p>
<p>2.7 <i>What measures were taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons (who are the beneficiaries and is the development located appropriately)? Considering the need for social equity and justice, do the alternatives identified, allow the "best practicable environmental option" to be selected, or is there a need for other alternatives to be considered?</i></p>	<p>No person's rights will be negatively affected by the proposed activity. The majority of the servitude property belongs to the City of Ekurhuleni (COE) and the affected landowners have been notified of the proposed development. No resident will be vacated due to the development thereto. The rights of the residents will in no way be infringed due to the proposed pipeline construction. Instead the proposed project will assist in improving basic sanitation services and creating employment to previously disadvantaged local communities as part of the National Development Plan.</p>
<p>2.8 <i>What measures were taken to pursue equitable access to environmental</i></p>	<p>The proposed project in its nature provides benefits and services to meet basic human needs and ensure human well-being as it will improve sanitation services within the Kempton Park area as well as the greater community. The proposed project forms part of the</p>



Requirement	Part where requirement is addressed/response
resources, benefits and services to meet basic human needs and ensure human wellbeing, and what special measures were taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination?	<p>greater Eastern Outfall Sewer initiative by the City of Ekurhuleni and will add to the positive benefits of service provision within the municipality.</p> <p>New employment opportunities will be created in the construction phase, of which 53 will be women, and 2 people with disability. Therefore, the discrimination on the disabled and women is fended off.</p>
2.9 What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development's life cycle?	The proposed project will result in positive social impacts were reliable sanitation services will be appreciated by the community of Pomona and other surrounding areas. It will promote good health practices within the community. Employment opportunities will be generated during the construction, new business opportunities will be encouraged.
What measures were taken to:	
2.9.1 <i>Ensure the participation of all interested and affected parties,</i>	<p>The proposed project followed a Public Participation Process(PPP) as per the NEMA 2014 EIA Regulations and as mentioned the Public Participation Process for this project was conducted by Shangoni Management Services.</p> <p>The PPP was conducted in an inclusive and transparent manner and the following legislation and guidelines were adapted:</p> <ul style="list-style-type: none"> • Chapter 6 of the 2014 EIA Regulations; • GN 807 of 2012; Public Participation Guideline; • Guideline on Need and Desirability, Department of Environmental Affairs DEA (2017); • Other relevant legislation such as the Promotion of Access to Information Act (PAIA), 2000. <p>Section 9 of this report has assessed the proposed development of the sewage pipeline in terms of the needs and desirability of the proposed activity and the subsequent impact on the proposed development site and the surrounding areas. The specialist studies have provided mitigation measures and recommendations that should be adopted to minimise negative impacts, as well as recommendations to enhance positive impacts.</p>
2.9.2 <i>Provide all people with an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation,</i>	The proposed project followed a Public Participation Process(PPP) as per the NEMA 2014 EIA Regulations and the Public will have ample opportunity to comment on the draft BAR & EMPr. All comments received from the public will be addressed and captured as part of the PPP process. The public will, and their inputs will form part of the environmental impact assessment process.
2.9.3 <i>Ensure participation by vulnerable and disadvantaged persons,</i>	All public including vulnerable and disadvantaged persons will be included in our Public Participation Process as outlined above.
2.9.4 <i>Promote community wellbeing and empowerment through environmental</i>	The proposed project in its nature provides benefits and services to meet basic human needs and ensure human wellbeing as it will improve sanitation services within the Kempton Park area as well as the greater community. The proposed development forms part of



Requirement	Part where requirement is addressed/response
<i>education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means,</i>	the greater Eastern Outfall Sewer initiative by the City of Ekurhuleni and will add to the positive benefits of service provision within the municipality.
2.9.5 <i>Ensure openness and transparency, and access to information in terms of the process,</i>	<p>The public participation process for this project was conducted by Shangoni Management Services in terms of:</p> <ul style="list-style-type: none"> • The procedures and provisions in terms of the NEMA; • Chapter 6 of the 2014 EIA Regulations; • GN 807 of 2012; Public Participation Guideline; and • Other relevant legislation such as the Promotion of Access to Information Act (PAIA), 2000. <p>Therefore, the process was open and transparent, and the public had access to all documents throughout the process. All public comments have been included in this document and addressed appropriately.</p>
2.9.6 <i>Ensure that the interests, needs and values of all interested and affected parties were taken into account, and that adequate recognition were given to all forms of knowledge, including traditional and ordinary knowledge, and</i>	
2.9.7 <i>Ensure that the vital role of women and youth in environmental management and development were recognised and their full participation therein were be promoted?</i>	
2.10 <i>Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community (e.g. a mixture of low-, middle-, and high-income housing opportunities) that is consistent with the priority needs of the local area (or that is proportional to the needs of an area)?</i>	Local labour and broad-based black economic empowerment will be considered when sourcing labour.
2.11 <i>What measures have been taken to ensure that current and/or future workers will be informed of work that potentially might be harmful to human health or the environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected?</i>	The EMPr (Annexure H) addresses the mitigation measures and management actions to be conducted to reduce negative environmental impacts, including those impacts that might affect the surrounding communities. Awareness training and on the job training for the construction workers have been included as part of the EMPr and will be the responsibility of the construction contractor as well as the proponent (COE). Furthermore, employment contracts will also be put in place for each worker. The Environmental Control Officer will conduct an environmental awareness training for the construction workers before commencement of work. Safety and health will be considered a priority.



Requirement	Part where requirement is addressed/response
Describe how the development will impact on job creation in terms of, amongst other aspects:	
2.11.1 <i>The number of temporary versus permanent jobs that will be created,</i>	Approximately 100 temporary employment opportunities will be created during the construction phase and no permanent jobs will be granted.
2.11.2 <i>Whether the labour available in the area will be able to take up the job opportunities (i.e. Do the required skills match the skills available in the area),</i>	Out of the approximate 100 new employment opportunities to be created in the construction phase of the project, approximately 25% will be new skilled employment and approximately 75% are unskilled.
2.11.3 <i>The distance from where labourers will have to travel,</i>	Labour will be sourced locally.
2.11.4 <i>The location of jobs opportunities versus the location of impacts (i.e. Equitable distribution of costs and benefits), and</i>	The proposed project will result in positive social impacts where sanitation services will be appreciated by the community and the development will also result in employment and technical skills transfer to the local communities during the construction phase of the project.
2.11.5 <i>The opportunity costs in terms of job creation (e.g. A mine might create 100 jobs, but impact on 1000 agricultural jobs, etc.).</i>	Due to the proposed project, no jobs will be lost. Approximately 100 new jobs will be created during the construction phase.
What measures were taken to ensure:	
2.11.6 <i>That there were intergovernmental coordination and harmonisation of policies, legislation and actions relating to the environment, and</i>	<p>The public participation process for this project was conducted by Shangoni Management Services in terms of:</p> <ul style="list-style-type: none"> •The procedures and provisions in terms of the NEMA; •Chapter 6 of the 2014 EIA Regulations; •GN 807 of 2012; Public Participation Guideline; and •Other relevant legislation such as the Promotion of Access to Information Act (PAIA), 2000. <p>Therefore, the process was open and transparent, and the public had access to all documents throughout the process. All public comments have been included in this document and addressed appropriately.</p>
2.11.7 <i>That actual or potential conflicts of interest between organs of state were resolved through conflict resolution procedures?</i>	The City of Ekurhuleni (the applicant) is an organ of state, therefore no conflict of interest is foreseen.
2.12 <i>What measures were taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the public interest, and that the environment will be protected as the people's common</i>	The Basic Assessment process is being undertaken as required in terms of the 2014 NEMA EIA Regulations. The process will ensure that the environment is protected. Furthermore, the EMPr provides recommendations and management actions for all aspects of the project lifecycle, including monitoring frequency and monitoring responsibility and will be regarded as a legal binding document to the applicant.



Requirement	Part where requirement is addressed/response
heritage?	
2.13 Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left?	The mitigation measures provided have been carefully considered in terms of long term viability and relevance. The proposed development will be monitored during the operational phase to ensure that no negative cumulative impacts will arise from the poor maintenance of the proposed sanitation infrastructure.
2.14 What measures were taken to ensure that he costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects will be paid for by those responsible for harming the environment?	EMPr provides recommendations and management actions for all aspects of the project lifecycle, including monitoring frequency and monitoring responsibility and will be regarded as a legal binding document to the Applicant. The EMPr further ensures that rehabilitation will be undertaken when required and that any pollution, environmental degradation and resulting adverse health effects will be remedied by the applicant or the polluter.
2.15 Considering the need to secure ecological integrity and a healthy bio-physical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the best practicable environmental option in terms of socio-economic considerations?	<p>The proposal is the preferred layout as all impacts identified as part of the proposed activity has been mitigated to low impact significance with mitigation. The proposal provides many positive socio-economic benefits with high (positive) impact significance, these impacts include:</p> <ul style="list-style-type: none"> ○ Creation of Jobs and transfer of skills, ○ Sourcing of local goods and services, ○ Improved functioning of the sewage infrastructure in the greater Kempton Park area, and ○ Increased capacity to deal with the anticipated future volumes of sewage as a result of development in the area.
2.16 Describe the positive and negative cumulative socio-economic impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and other planned developments in the area?	<p>Layout alternative 1 involves the realignment of approximately 434 m of the proposed sewer pipeline(associated with section 1 of the proposed sewer pipeline layout). The realignment will involve placing the pipeline to the west of the existing access road. This will in turn result in the disturbance of an area that has not been subjected to level of transformation that the preferred site has been exposed to.</p> <p>The proposed layout (preferred) will involve placing the proposed sewer pipeline within an existing access road as it follows an existing sewer line and as such it will make use of land that has been subject to human activity such as the existing sewer line and the use of the route as an access road by vehicles and pedestrians .The proposed layout(PREFERRED) will have a low impact on the environment as compared to Layout Alternative 1 that proposes the disturbance of an area that has not been previously disturbed. The proposed site for the proposed layout(preferred) is supported by the geotechnical specialist as the surrounding area has geological constraints related to soil instability.</p> <p>The proposal is supported from an ecological and engineering perspective as outlined in the specialist report and has a low risk to the environment. Thus, the proposed layout is preferred.</p> <p>The predicted cumulative impacts will however be low if managed according to the EMPr.</p>



10. The period for which the environmental authorization is required

(CONSIDER WHEN THE ACTIVITY IS EXPECTED TO BE CONCLUDED)

For a period of 10 years.

11. Environmental management programme (EMPr)

(must include post construction monitoring requirements and when these will be concluded.)

If the EAP answers "Yes" to Point 7 above, then an EMP is to be attached to this report as an Appendix

EMPr attached

YES, refer to Annexure H



SECTION F: APPENDIXES

The following appendixes must be attached as appropriate (this list is inclusive, but not exhaustive):

It is required that if more than one item is enclosed that a table of contents is included in the appendix

- Appendix A: Site plan(s) – *(must include a scaled layout plan of the proposed activities overlain on the site sensitivities indicating areas to be avoided including buffers)*
- Appendix B: Photographs
- Appendix C: Facility illustration(s)
- Appendix D: Route position information
- Appendix E: Public participation information
- Appendix F: Water use license(s) authorisation, SAHRA information, service letters from municipalities, water supply information
- Appendix G: Specialist reports
- Appendix H: EMPr

CHECKLIST

To ensure that all information that the Department needs to be able to process this application, please check that:

- Where requested, supporting documentation has been attached;
- All relevant sections of the form have been completed.

