BASIC ASSESSMENT PROCESS
for
THE HOUGHTON ESTATE SEWER PIPE REPLACEMENT PROJECT IN THE CITY OF JOHANNESBURG, GAUTENG PROVINCE

DRAFT BASIC ASSESSMENT REPORT

Public Review Period:

29 July 2019 to 30 August 2019

COMPILED BY:
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GAUTENG PROVINCE
AGRICULTURE AND RURAL DEVELOPMENT
REPUBLIC OF SOUTH AFRICA

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 isnot 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.

Not Applicable

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.

There are currently no plans to decommission

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? **No**

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

Refer to Appendix E9 – IAP Register

If no, state reasons for not attaching the list.

Have State Departments including the competent authority commented? **N/A**

If no, why?

This information will be available after DBAR has been reviewed

PROJECT DETAILS

Reference #:		Not yet assigned
Title:		Basic Assessment Process for The Houghton Estate Sewer Pipe Replacement Project in the City of Johannesburg, Gauteng Province
Report compiled by:		Company Name: Envirolution Consulting Contact person: Ms Sheila Bolingo Postal Address: P.O. Box 1898, Sunninghill, 2157 Telephone Number: 0861 44 44 99 Fax Number: 0861 62 62 22 Email: sheila@envirolution.co.za
Client	:	Johannesburg Water SOC Ltd
Report Status	:	Draft Basic Assessment Report for Public Review
Review period		**The 30-day period for review is from** **29 July 2019 to 30 August 2019**

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LIST OF APPENDICES:

PUBLIC REVIEW OF THE DRAFT BASIC ASSESSMENT REPORT

The Draft Basic Assessment Report (BAR) has been prepared by Envirolution Consulting (Pty) Ltd in order to assess the potential environmental impacts associated with the Houghton Estate Sewer Pipe Replacement Project in the City of Johannesburg. The report is made available for public review for 30-day review period from **29 July 2019 to 30 August 2019** at the following places:

Killarney Public Library
60 Riviera Rd, Killarney
Sandton, 2193
Tel: 011 646 3088

In order to obtain further information, register on the project database or submit your written comment to:

Environmental Assessment Practitioner

Name:	Sheila Bolingo
Physical Address:	Vista Place, Suite 1a & 2, No 52, Cnr Vorster Avenue & Glen Avenue, Glenanda
Postal Address:	PO Box 1898, Sunninghill, 2157
Telephone Number:	(0861) 44 44 99
Fax Number:	(0861) 62 62 22
E-mail:	sheila@envirolution.co.za

The due date for comments on the Draft Basic Assessment Report is 30 August 2019.

EXECUTIVE SUMMARY

Johannesburg Water SOC LTD (to be referred to Joburg Water hereafter) is proposing the replacement of sewer pipe in Houghton. A works request was received from Johannesburg Water's Infrastructure Planning Section for the replacement of the existing Vitrified clay sewer pipes located in Houghton. Houghton is located approximately 10 km north of the Johannesburg CBD.

A project charter was compiled by the Johannesburg Water Infrastructure Planning Section requesting for the replacement of existing sewer pipes within identified streets in the Houghton area. Numerous blockages have been experienced in the area. The project was assigned to the Design Section to investigate, carry out designs and implement. The sewers from the affected streets in the network were prioritized for replacement within the 2017/2018 financial year as emergency projects.

It was discovered that all the sewer lines in Houghton are 70 years old; the pipes were laid in the year 1948. It was decided that the pipes should be upgraded due to numerous blockages, sewer overflows and pipe collapse in the area. The project is currently under investigations and CCTV inspection will be conducted in order to obtain information about the structural integrity of the pipe. The main objective of this project is to replace the existing Vitrified Clay and concrete pipes in Houghton. It was determined by infrastructure planning of Johannesburg water that the pipes have to be prioritised as emergency projects and there the pipe needed to be upgraded and refurbished.

The majority of the proposed pipeline is aligned within the servitudes/ road reserve. As this project is for the installation of a buried water pipeline, impacts associated with the area are of low significance with mitigations.

It is the opinion of the specialist that no fatal flaws have been identified for the Houghton Estate Sewer Pipe Replacement Project, and that the project should proceed with adequate mitigation measures implemented to reduce impacts to local and downstream water resources...

SECTION A: ACTIVITY INFORMATION

1. PROPOSAL OR DEVELOPMENT DESCRIPTION

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

1.1 Project Title

THE HOUGHTON ESTATE SEWER PIPE REPLACEMENT PROJECT IN THE CITY OF JOHANNESBURG, GAUTENG PROVINCE

1.2 Project Locality

Johannesburg Water SOC LTD (to be referred to Joburg Water hereafter) is proposing the replacement of sewer pipe in Houghton. A works request was received from Johannesburg Water's Infrastructure Planning Section for the replacement of the existing Vitrified clay sewer pipes located in Houghton. Houghton is located approximately 10 km north of the Johannesburg CBD. **Figure 1** below depicts the locality map of the proposed site where the pipe replacement will take place.

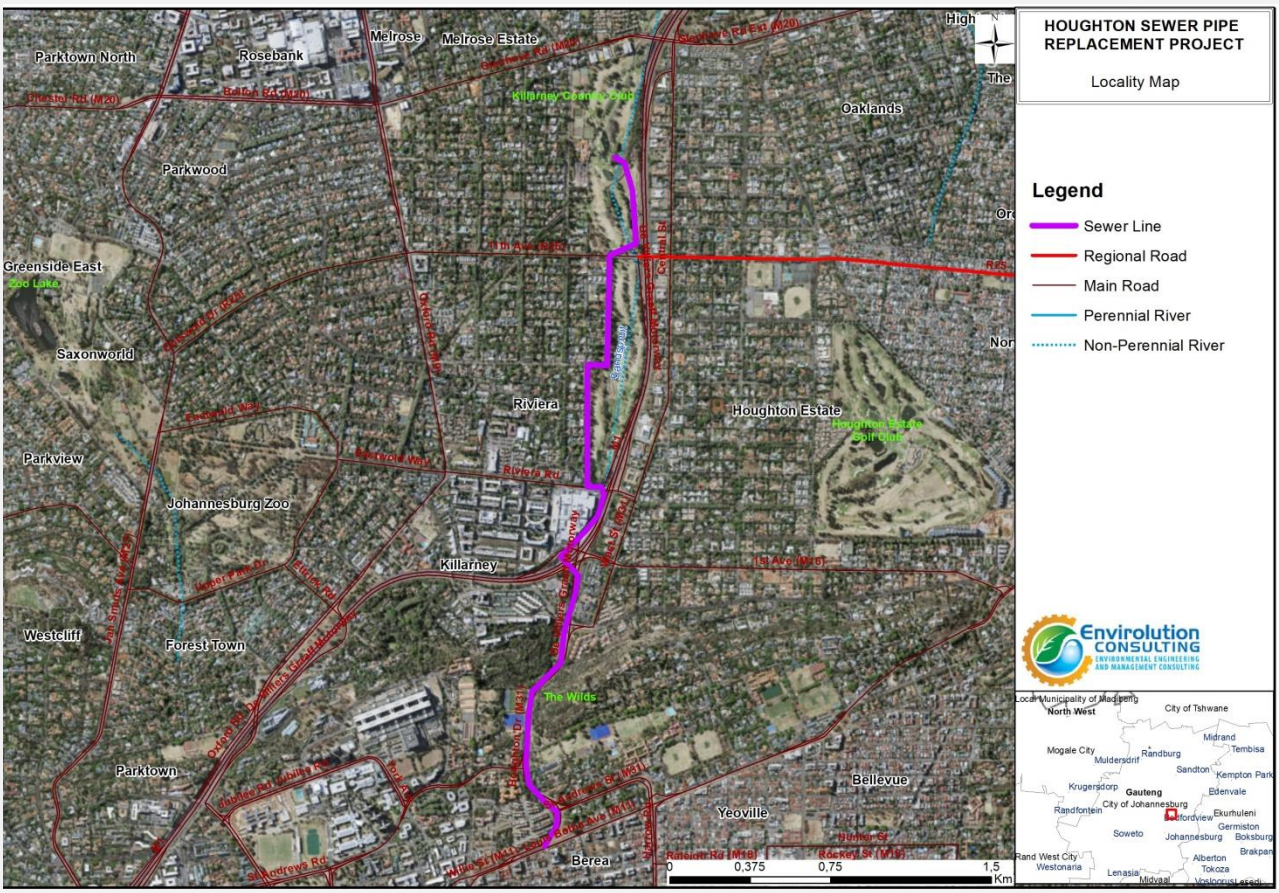


Figure 1: Locality Map showing the Houghton Estate Sewer Line to be upgraded (Refer to **Appendix A** for A3 maps).

The pipeline aligns from north to south. The northern section of the route is situated in Lower Houghton and the southern portion is situated just north of Berea in the City of Johannesburg (Gauteng) (**Figure 1**). The northern section is situated directly west of the M1 and traverses a part of the Killarney Golf Course. The route then crosses the M1 southwards and aligns directly west Houghton drives, with a portion of the route situated within The Wilds Park. Houghton Drive divides the park in a western and eastern portion.

1.3 Project Background

A project charter was compiled by the Johannesburg Water Infrastructure Planning Section requesting for the replacement of existing sewer pipes within identified streets in the Houghton area. Numerous blockages have been experienced in the area. The project was assigned to the Design Section to investigate, carry out designs and implement. The sewers from the affected streets in the network were prioritized for replacement within the 2017/2018 financial year as emergency projects.

It was discovered that all the sewer lines in Houghton are 70 years old; the pipes were laid in the year 1948. It was decided that the pipes should be upgraded due to numerous blockages, sewer overflows and pipe collapse in the area. The project is currently under investigations and CCTV inspection will be conducted in order to obtain information about the structural integrity of the pipe.

The main objective of this project is to replace the existing Vitrified Clay and concrete pipes in Houghton. It was determined by infrastructure planning of Johannesburg water that the pipes have to be prioritised as emergency projects and there the pipe needed to be upgraded and refurbished.

1.4 The scope of the works

The scope of work covers the installation of new HDPE and uPVC sewer pipes of sizes ranging from 160mm diameter to 500mm diameter, by means of the pipe cracking method and the open trench excavation method. The Preliminary Scope of work covers the installation of the following pipe sections;

- 160 mm diameter HDPE pipe: 198 m
- 250 mm diameter HDPE pipe: 15 m
- 315 mm diameter HDPE pipe: 592 m
- 355 mm diameter HDPE pipe: 322 m
- 400 mm diameter HDPE pipe: 2382 m
- 450 mm diameter HDPE pipe: 20 m
- 450 mm diameter concrete pipe: 623 m
- 525 mm diameter concrete pipe: 69 m

In addition to the above, the scope of work will incorporate at least the following activities, among others:

- Pipe cracking of the existing pipe.
- Connections of the newly installed sewer pipes to the collector pipes

- Tying in the new sewer pipes to existing pipes.
- Dealing with live sewage flow during construction.
- Locating, exposing and protection of existing services.

1.5 Pipe location

The majority of the proposed pipeline is aligned within the servitudes/ road reserve; however a portion of the pipe is situated under the Killarney Mall and within the Klliarney Country Club (KCC). The new sewer mains will be laid 1 m away from the existing pipe where there is sufficient space in the road reserve. The proposed pipe will be laid on the highest side of the road reserve, to avoid flooding of property in a case of a pipe Blockages. The existing pipe will be decommissioned after the new pipe is laid and will be left in the ground.

1.6 Operational and maintenance requirements

Shutdowns during implementation will be an all-inclusive exercise and coordinated by Johannesburg Water's Operations Department. The contractor will be required to provide the method statement for tie-ins prior to the shutdown.

PLEASE REFER TO THE PRELIMINARY DESESIGN REPORT FOR FURTHER INFORMATION (**see Appendix I3**).

1.7 Requirement for a Basic Assessment Process

In terms of sections 24(2) and 24D of the National Environmental Management Act (Act No. 107 of 1998), as read with the Environmental Impact Assessment (EIA) Regulations of GNR 982 to R985 (as amended 07 April 2017 (GNR 326)), a Basic Assessment process is required for the proposed project. **Table 1** contains the listed activities in terms of the EIA Regulations and includes a description of those project activities which relate to the applicable listed activities.

Table 1: Listed Activities Applicable applied for to be authorise

Listed activities	Description of project activity that triggers listed activity
Activity 19 of Listing Notice (LN) 1 of GNR 983 The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse	The proposed project will result in infilling and depositing of more than 10m³ into a watercourse. In addition the excavation and removal of soil materials of more than 10 m³ from a watercourse will take place during the construction of the pipeline.
Activity 12 of GNR R.985: The clearance of an area of 300 square metres or more of indigenous vegetation **(b) In Gauteng:** i. Within any critically endangered or **endangered ecosystem listed in terms of section 52 of the NEMBA** or prior to the publication of such a list, within	The clearance of an area of 300 square metres or more of indigenous vegetation is required for the proposed pipeline within endangered ecosystem listed in terms of section 52 of the NEMBA and Critical Biodiversity Areas /Ecological Support Areas identified in the Gauteng Conservation Plan.

an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; **ii.** Within Critical Biodiversity Areas or Ecological Support Areas identified in the Gauteng Conservation Plan or bioregional plans;	
Activity 14 of Listing Notice (LN) 3 of GNR 985 The development of: (ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs – a) within a watercourse; **c) In Gauteng**: iv. sites identified as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) Gauteng Conservation Plan or in bioregional plans; v. sites identified within threatened ecosystems listed in terms of the National Environmental Management Act: Biodiversity Act (Act No. 10 of 2004); vi. sensitive areas identified in an environmental management framework adopted by relevant environmental body.	The proposed pipeline will be constructed over an area of 10 square meters or more within a watercourse on areas identified as Important and Ecological Support Area by the Gauteng Conservation Plan.

The above listed activities have triggered a Basic Assessment Process, these activities may not commence without an environmental authorization from the competent Authority. The aim of the Environmental Impact Assessment is to ensure that:

- The potential environmental impacts and risks associated with the proposed project are taken into consideration
- Public Participation Process is conducted i.e. to afford any Interested and or Affected parties (I&AP) sufficient opportunity: to provide comments
- Sufficient information is provided to decision markers in order to ensure an informed decision making.

The nature and extent of the proposed project are explored in more detail in this Basic Assessment Report. This report has been compiled in accordance with the requirements of the EIA Regulations and includes details of the activity description; the site, area and property description; the public participation process; the impact assessment; and the recommendations of the Environmental Assessment Practitioner.

1.8 Details of Environmental Assessment Practitioner and Expertise to conduct the Basic Assessment

Envirolution Consulting was appointed by **CivEc Engineering** on behalf of **Joburg Water** to undertake a Basic Assessment process and Water Use License for the proposed project. Furthermore, Envirolution Consulting does not have any interests in secondary developments that may arise out of the authorisation of the proposed project. Envirolution Consulting is a specialist environmental consulting company providing holistic environmental management services, including environmental impact assessments and planning to ensure compliance with environmental legislation and evaluate the risk of development; and the development and implementation of environmental

management tools Envirolution Consulting benefits from the pooled resources, diverse skills and experience in environmental field held by its team. We offer solutions to environmental issues that are key during our clients' planning and decision-making processes. The Envirolution Consulting team have considerable experience in environmental impact assessments and environmental management, and have been actively involved in undertaking environmental studies, for a wide variety of projects in South Africa, including those associated with linear developments.

The EAPs from Envirolution Consulting who are responsible for this project are (refer to **Appendix I** for CV's):

- Cheda Sheila Bolingo, the principle author of this Basic Assessment holds an Msc degree in Environmental Management with 8 years of experience in the consulting field. Her key focus areas are on strategic environmental assessment and advice on environmental impact assessments; public participation; environmental management programmes, and mapping through ArcGIS for variety of environmental projects. She is currently involved in several diverse projects across the country.
- Gesan Govender, the project manager and Environmental Assessment Practitioner (EAP) responsible for this project, is a registered Professional Natural Scientist and holds an Honours degree in Botany. He has over 15 years of experience within the field of environmental management. His key focus is on strategic environmental assessment and advice; management and co-ordination of environmental projects, which includes integration of environmental studies and environmental processes into larger engineering-based projects and ensuring compliance to legislation and guidelines; compliance reporting; the identification of environmental management solutions and mitigation/risk minimising measures; and strategy and guideline development. He is currently responsible for the project management of EIA's for several diverse projects across the country.

Select the appropriate box

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

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

YES

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

The Sewer pipeline will be crossing a watercourse and falls within the 100 year floodline. It is for such reasons that a Water Use License application process has to be undertaken for the development. According to the National Water Act (NWA), 1998 (Act No.36 of 1998), the proposed development requires a Water Use License as per the following regulations:

- Section 21(c): impeding or diverting the flow of water in a watercourse and;
- Section 21 (i): altering the bed, banks, course or characteristics of a watercourse.

If yes, have you applied for the authorisation(s)? YES

If yes, have you received approval(s)? (attach in appropriate appendix)	[redacted]	NO

The Department of Water and Sanitation (DWS) are on the project database and have been identified as the relevant authority for the Water Use Licence Application. The copy of the DBAR was also sent to this Dept. for comments during the review period. A pre- application process for water use license has been initiated with the Department of Water affairs and Sanitation (DWS) as per the correspondence **Appendix E4**.

Note that timeframes for obtaining a WUL from DWS is not specified in the GDARD.

2. APPLICABLE LEGISLATION, POLICIES AND / OR GUIDELINES

Table 3: 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 (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	National		
National Environmental Management Act (Act No. 107 of 1998)	• NEMA requires, inter alia, that: ∗ Development must be socially, environmentally, and economically sustainable." ∗ Disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied." ∗ A risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions." • EIA Regulations have been promulgated in terms of Chapter 5. Activities which may not commence without an environmental authorisation are identified within these Regulations. • In terms of S24(1) of NEMA, the potential impact on the environment associated with these listed activities must be considered, investigated, assessed and reported on to the competent authority charged by NEMA with granting of the relevant environmental authorisation.	» National Department of Environmental Affairs » Gauteng Department of Agriculture and Resource Development	• In terms of sections 24(2) and 24D of the National Environmental Management Act (No 107 of 1998), as read with the EIA Regulations 2014 of GN R983 and R985; a Basic Assessment process is required to be undertaken for the proposed project.
National Environmental Management: Biodiversity Act (Act 10 of 2004)	• Section 52(1)(a) of the National Environmental Management: Biodiversity Act (Government Gazette 34809, Government Notice 1002, 9 December 2011	» National Department of Environmental Affairs	• No TOPS species are expected to occur on the site as no suitable habitat for these species are present.

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	provides for listing threatened or protected ecosystems in one of four categories: critically endangered (CR), endangered (EN), Vulnerable (VU) or Protected. These species are commonly referred to as TOPS listed	» Gauteng Department of Agriculture and Resource Development	
National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)	• The Minister may by notice in the Gazette publish a list of waste management activities that have, or are likely to have, a detrimental effect on the environment. • In terms of the regulations published in terms of this Act (GN 921 of December 2013), a Basic Assessment or Environmental Impact Assessment is required to be undertaken for identified listed activities. • Any person who stores waste must at least take steps, unless otherwise provided by this Act, to ensure that (a) The containers in which any waste is stored, are intact and not corroded or in any other way rendered unlit for the safe storage of waste; (b) Adequate measures are taken to prevent accidental spillage or leaking; (c) The waste cannot be blown away; (d) Nuisances such as odour, visual impacts and breeding of vectors do not arise; and (e) Pollution of the environment and harm to health are prevented.	» National Department of Environmental Affairs (hazardous waste) » Gauteng Department of Agriculture and Resource Development (general waste)	• In terms of GNR921, no waste license is required for the project • Waste handling, storage and disposal during construction and operation is required to be undertaken in accordance with the requirements of this Act, as detailed in the applicable EMPr, as well as in accordance with the relevant Norms and Standards.
National Environmental Management: Air Quality Act (Act No. 39 of 2004)	• S18, S19 and S20 of the Act allow certain areas to be declared and managed as “priority areas”. • Dust control regulations promulgated in December 2013 may require the implementation of a dust management plan.	» National Department of Environmental Affairs » City of Ekurhuleni	• Reporting in terms of compliance to GNR831 will be required. • While no permitting or licensing requirements arise from this legislation, this Act will find application during the

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
			construction phase of the project. The Air Emissions Authority (AEL) may require the compilation of a dust management plan.
National Water Act (Act No. 36 of 1998)	• Under S21 of the Act, water uses must be licensed unless such water use falls into one of the categories listed in S22 of the Act or falls under the general authorisation. • In terms of S19, the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to prevent and remedy the effects of pollution to water resources from occurring, continuing, or recurring.	» National Department of Water Affairs » Gauteng Department of Agriculture and Resource Development	The proposed development requires a Water Use License as per the following regulations: • Section 21(c): impeding or diverting the flow of water in a watercourse and; • Section 21 (i): altering the bed, banks, course or characteristics of a watercourse. • Requirements set by S19 will apply throughout the life-cycle of the project.
Environment Conservation Act (Act No. 73 of 1989)	• National Noise Control Regulations (GN R154 dated 10 January 1992)	» National Department of Environmental Affairs » Gauteng Department of Agriculture and Resource Development » Local Authorities	There is no requirement for a noise permit in terms of the legislation.
National Heritage Resources Act (Act No. 25 of 1999)	• S38 states that Heritage Impact Assessments (HIAs) are required for certain kinds of development including: * The construction of a road, powerline, pipeline, canal or other similar linear development or barrier exceeding 300 m in length; * Any development or other activity which will change the character of a site exceeding 5 000 m^2 in extent .	» South African Heritage Resources Agency	• The proposed pipeline exceeds 300m in length. • A Heritage Assessment has been undertaken as part of this Basic Assessment • Due to the density of the urban development in the region, it is very unlikely that any sites or features dating to the pre-colonial history of the region would still exist in the study area. However, isolated objects such as Stone Age artefacts might be exposed in areas close to stream beds.
National Environment Management	• Wetlands and other critical Biodiversity areas are	» National Department of	• No permitting requirements were triggered

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
Protected Areas Act, 2003 (Act No. 57 of 2003).	regulated under the NEM:BA. Activities that fall within the parameters of these areas require specialist assessment to determine the impacts and the residual effects of mitigation measures	Environmental Affairs	by the activities.
Conservation of Agricultural Resources Act (Act No 43 of 1983).	Regulation 15 of GNR1048 provides for the declaration of weeds and invader plants, and these are set out in Table 3 of GNR1048. Declared Weeds and Invaders in South Africa are categorised according to one of the following categories: • Category 1 plants: are prohibited and must be controlled. • Category 2 plants: (commercially used plants) may be grown in demarcated areas providing that there is a permit and that steps are taken to prevent their spread. • Category 3 plants: (ornamentally used plants) may no longer be planted; existing plants may remain, as long as all reasonable steps are taken to prevent the spreading thereof, except within the floodline of watercourses and wetlands.	» Department of Agriculture, Forestry and Fisheries (DAFF)	• An alien species management plan to be included in the requirements of the EMPr.
Occupational Health and Safety Act (No 85 of 1993)	The Act provides for the health and safety of persons at work and for the health and safety of persons in connection with the use of machinery; the protection of persons other than persons at work, against hazards to health and safety arising out of or in connection with the activities of persons at work.	» Department of Labour	• The EMPr provides for measures to ensure that objectives of the Act are met on this site

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.

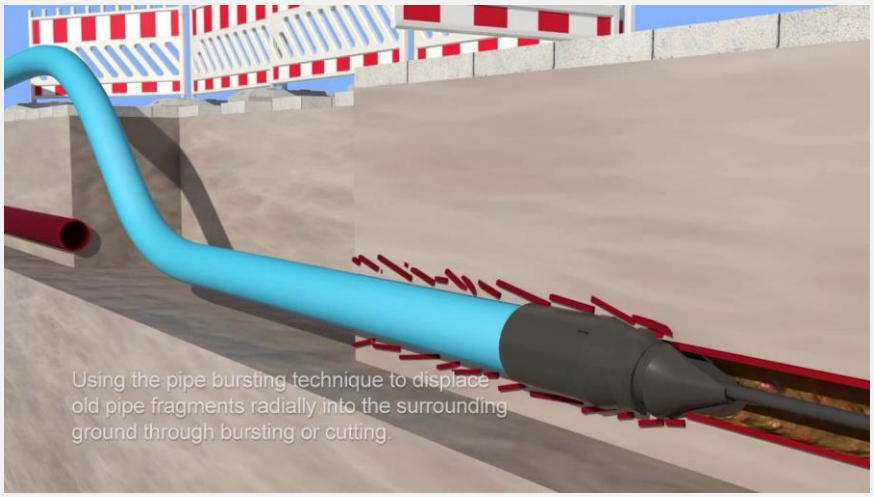
The no-go option must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. **Do not** include the no go option into the alternative table below.

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

Provide a description of the alternatives considered

Table 3: Description of the alternatives considered

Alternative type, either alternative: site on property, properties, activity, design, technology, energy, operational or other(provide details of "other")	**Description**
Site Alternatives	No site alternatives have been investigated for the proposed development for the following reasons: Houghton experiences several sewer blockages and sewer overflows, this can be attributed to the ageing of the infrastructure and intrusion of foreign objects (root intrusion) in the sewer system. The main objectives of the project are to improve service delivery to customers, reduce maintenance on the sewer system and reduce operating costs, thus this renders this alternative non-viable. Thus the identified site is the **only one site is deemed feasible** and practicable for the proposed development.
Design Alternative: (Pipe installation method for river crossing)	**ALTERNATIVE 1 (Pipe cracking) -** Pipe cracking is a technique used to fracture an existing pipeline from the inside using a pipe cracking head. During this process the mechanical device pushes the broken pipe remains into the surrounding ground while at the same time draws a new pipe of the same or larger diameter in place behind the cracking device. Pipe cracking is also referred to as pipe bursting or pipe splitting. Maintaining the existing alignment of the pipe; the pipeline will be installed using trenchless method of construction, Pipe Cracking. The pipeline will be installed under the river bed whereby there will be two pits opened on either side of the stream for the launching and reception pits.  **ALTERNTIVE 2 (open trench excavation) -** The open trench method entails replacing the existing Asbestos cement pipe using the conventional open trench method. The

	alignment of the new sewer line will, therefore, be the same as the existing sewer line, due to space limitations. **PREFERRED ALTERNATIVE:** Alternative 1 is the most preferred as it will minimize the interference with the water course. With this method given the steep elevation of this section of the project, deep excavations will be avoided.

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

N/A

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:

	Size of the activity:
Proposed activity (Pipe cracking Method for river crossing)	30 m[21]
Alternatives:	
Alternative 1 (Open Trenching Method for river crossing)	30 m[2]
Alternative 2 (if any)	
	Ha/ m[2]

or, for linear activities:

	Length of the activity:
Proposed activity	4km
Alternatives:	
Alternative 1	
Alternative 2 (if any)	
	m/km

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

	Size of the site/servitude:
Proposed activity	1500m[22]
Alternatives:	
Alternative 1	
Alternative 2 (if any)	
	Ha/m[2]

1 100m length x 0.38m width pipe river crossing only
[2] Approx. 4000m length x 0.38 pipe – full extent

5. SITE ACCESS

Proposed activity

Does ready access to the site exist, or is access directly from an existing road?	YES
If NO, what is the distance over which a new access road will be built	

Describe the type of access road planned:

The site is easily accessible from the M1 highway as shown in **Figure 2**. The pipeline infrastructure are mostly located on the road reserve, there is therefore direct road access.

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).

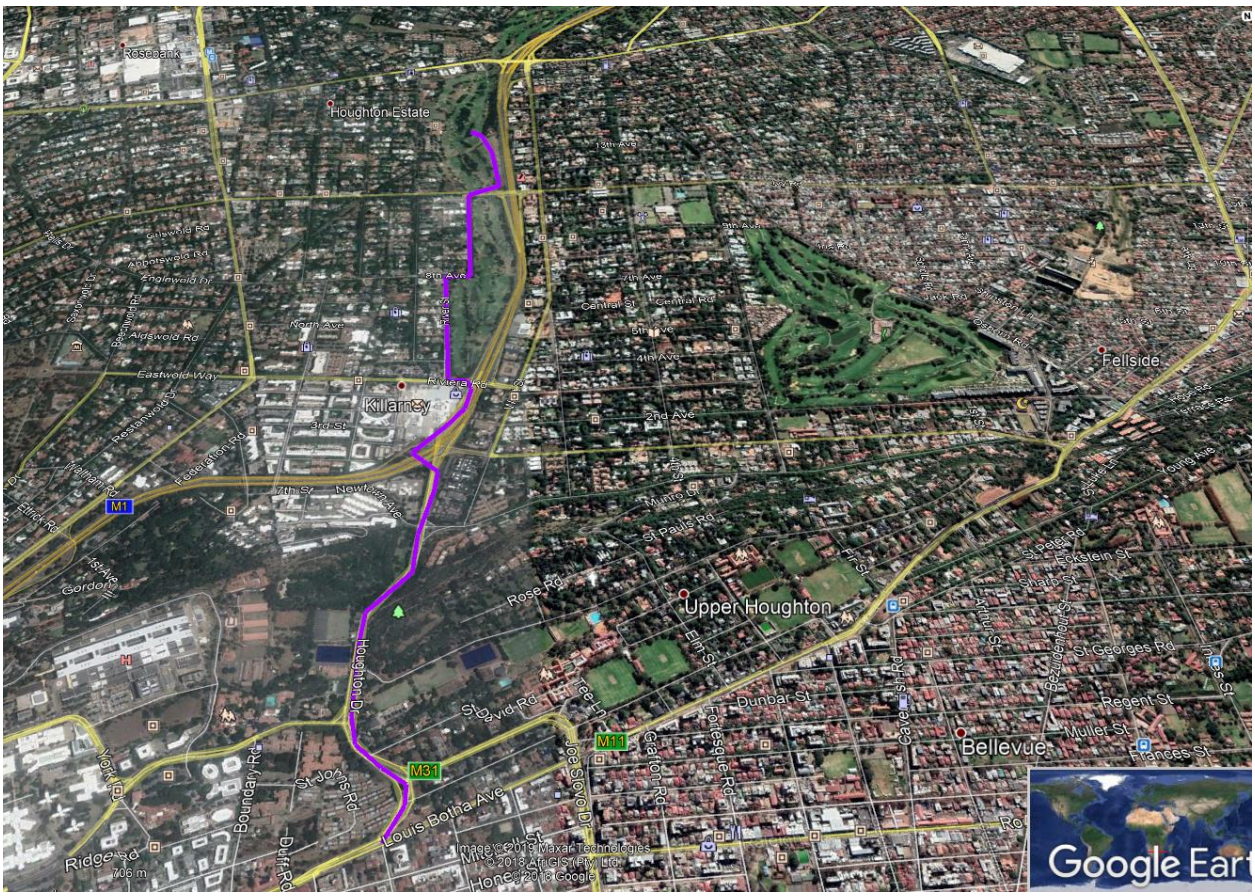


Figure 2: Overview of existing access roads to the site (**Sewer Pipe in Purple**)

Alternative 1

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

Describe the type of access road planned:

Same as for the Proposed Activity.

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 2 (Not Applicable)

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

Describe the type of access road planned:

Include the position of the access road on the site plan. (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)

The **layout plan** for the proposed development are enclosed within **Appendix A**

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 kilometres, 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.

The **Locality Map** for the proposed development are enclosed within **Appendix A**

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.

Reference is made to **Appendix B – Site Photographs** included as part of this application

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.

Reference is made to **Appendix C – Facility Illustration** included as part of this application

SECTION B: DESCRIPTION OF RECEIVING ENVIRONMENT

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

Instructions for completion of Section B for linear activities

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.

1. Indicate on a plan(s) the different environments identified
2. Complete Section B for each of the above areas identified
3. Attach to this form in a chronological order
4. Each copy of Section B must clearly indicate the corresponding sections of the route at the top of
5. the next page.

Section B has been duplicated for sections of the route	**0**	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 alterative 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	**0**	tim es	(complete only when appropriate)

It is worth noting that both design alternatives of Pipe Installation as discussed in Section A (3) are proposed in the same receiving environment and therefore will be assessed together as impacts will be similar. It is for this reason that the section will not be duplicated.

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.)	The proposed pipeline is proposed over the following properties ERF 2381 In Houghton Estate ERF 2382 In Houghton Estate ERF 2388 In Houghton Estate ERF 2390 In Houghton Estate ERF 2390 Portion 1 In Houghton Estate ERF 2532 In Houghton Estate ERF 2369 In Houghton Estate ERF 654 In Killarney ERF 655 Portion 1 In Killarney ERF 657 Portion 3 In Killarney

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.

Proposed Activity: Centre point of the activity	**Latitude (S):**	**Longitude (E):**

In the case of linear activities:

Proposed Activity:	**Latitude (S):**	**Longitude (E):**
▪ Starting point of the activity	26° 9'5.75"S	28° 3'21.17"E
▪ Middle point of the activity	26°10'6.30"S	28° 3'12.16"E
▪ End point of the activity	26°10'50.26"S	28° 3'9.50"E

Alternative 1	**Latitude (S):**	**Longitude (E):**
▪ Starting point of the activity		
▪ Middle point of the activity		
▪ End point of the activity		

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**. Please Refer To Appendix D**

Addendum of route alternatives attached **YES**

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

- T0IR03160000238100000
- T0IR03160000238200000
- T0IR03160000238800000
- T0IR03160000239000000

- T0IR03160000239000001
- T0IR03160000253200000
- T0IR03160000236900000
- T0IR03650000065400000
- T0IR03650000065500001
- T0IR03650000065700003

3. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Proposed Activity

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.

Proposed Activity

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

5. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

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

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

Hydrological Settings

Quaternary Catchment A21C falls in the first water management area (WMA), Limpopo (DWS, 2016). In this WMA the major rivers include the Limpopo, Matlabas, Mokolo, Lephalale, Mogalakwena, Sand, Nzhelele, Mutale and Luvuvhu. The pipeline lies along a section of the Sandspruit. This river confluence with the Braamfonteinspruit at Sunninghill. The Braamfonteinspruit in turn confluences with the Jukskei River. The Jukskei River in turn confluences with the Crocodile River. The Crocodile River joins with several rivers to the north, including the Elands and Marico Rivers to finally confluence with the Limpopo River.

Surface water spatial layers such as the National Freshwater Ecosystems Priority Areas (NFEPA) Wetland Types for South Africa (SANBI, 2013) and Gauteng Department of Agriculture and Rural Development (GDARD) were consulted for the presence of wetlands and rivers. This layer reflects one perennial river, a section of the Sandspruit River which flows along the M1. A small wetland is shows in The Wilds Park (**Figure 3**).

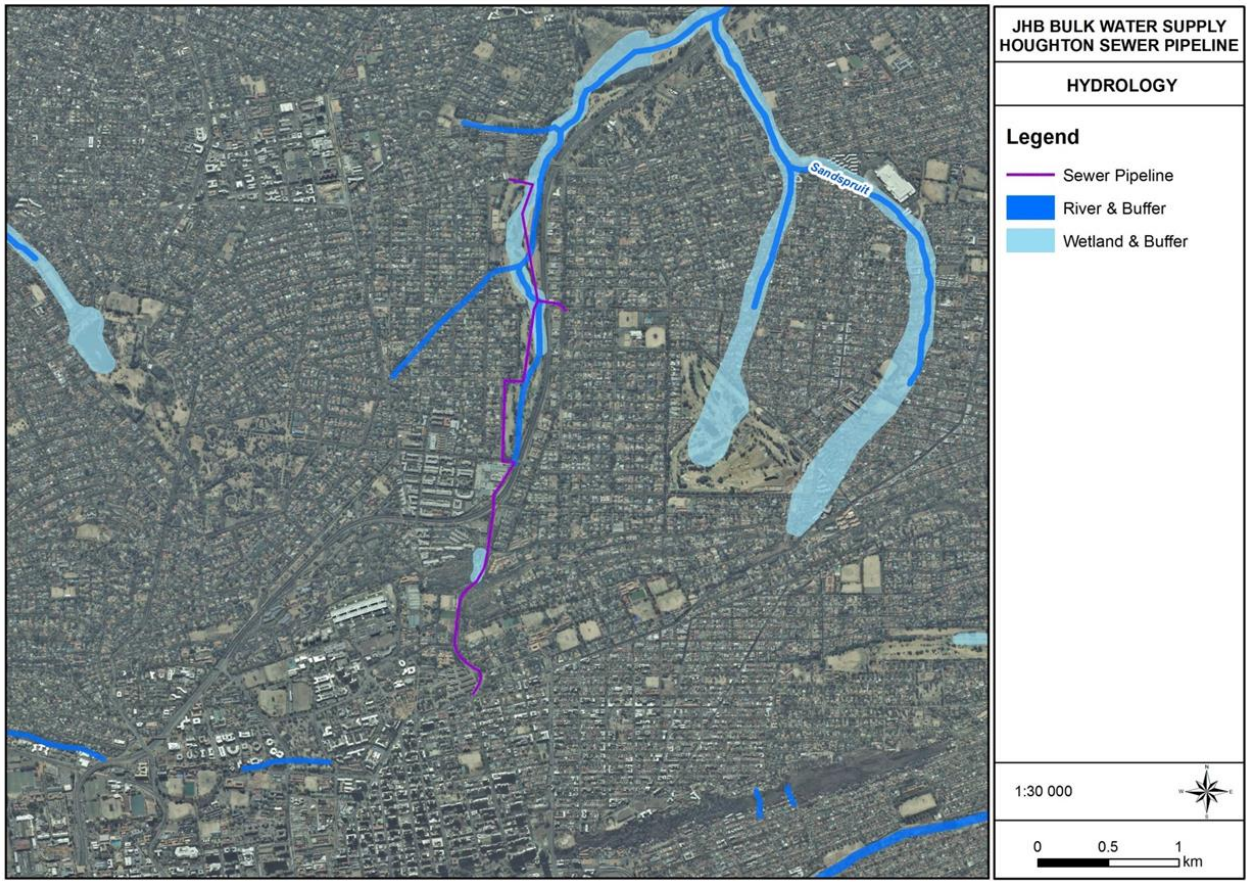


Figure 3: Regional hydrology

Geology and Soils

Archaean granite and gneiss of the Halfway House Granite underlies the entire study site (GDACE, 2002). This formation dates back to the Basement Complex that was formed close to the origin of the earth (approximately 4,600 to 2,500 million years ago). The basement complex acts in the same way as the shales. The shales are the most permeable of rock types, and water moves easily through them, becoming trapped above the intrusions. Groundwater recharge, such as seeps and springs, occurs on the slope face at the contact between the highly weathered shale and the impermeable layers. Erosion sets in with runoff increasing by as little as 5% in the soils found in this geological formation. Activities such as excavation and surface sealing in the catchment, adjacent and within wetlands with a Halfway House Granite Dome geology lead to the destruction of these ecosystems. The regional soil classification for the study area includes Unconsolidated soils. This soil type refers to soils that have been transformed by anthropogenic activity and have no remaining recognisable soil profiles.

No soil samples were indicative of natural wetland conditions except along sections of the Sandspruit that lie along the M1 highway. The Sandspruit also shows alluvial deposits and other riparian characteristics and not always clear mottling and gleying since it has been transformed by its urban setting for such a long time.

6. AGRICULTURE

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

	NO✔

According to the Gauteng Agricultural Potential Atlas (GAPA) the site falls within an area of A "**Very Low to None** *agricultural potential* "as depicted in **Figure 4**.

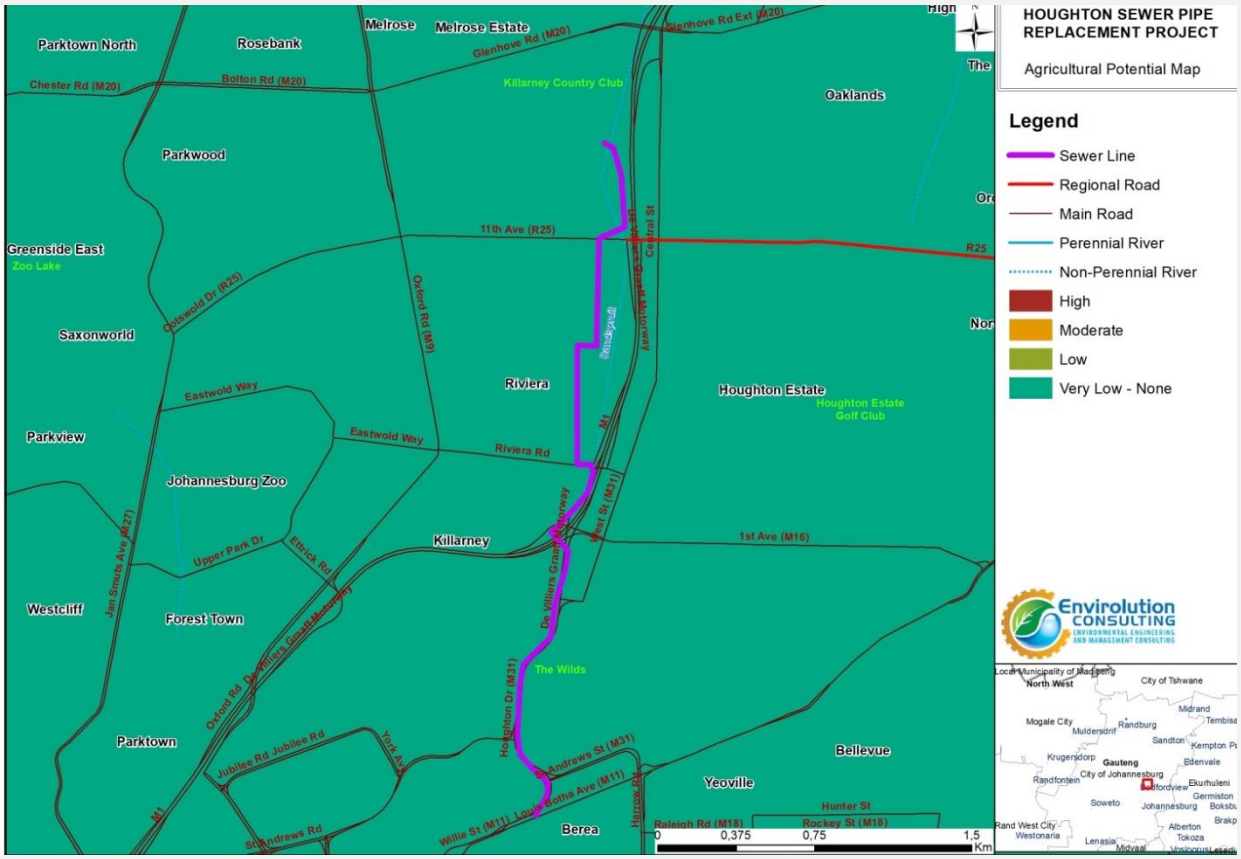


Figure 4: Agriculture potential Map for the study area

Please note: The Department 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 of groundcover present on the site and include the estimated percentage found on site

Natural veld - good condition % = 0	Natural veld with scattered aliens % = 0	**Natural veld with heavy alien infestation % =5**	Veld dominated by alien species % =0	**Landscaped (vegetation) % =20**
Sport field % =0	Cultivated land %=0	**Paved surface (hard landscaping) % =70**	Building or other structure % =0	**Bare soil % =5**

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.

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

NO✓

If YES, specify and explain:

Flora: A list of plants of conservation concern was compiled using information from the South African National Biodiversity Institute's (SANBI) checklist (SANBI, 2016b), Raimondo et al, (2009) and information received from the Gauteng Department of Agriculture and Rural Development (GDARD) for the quarter degree square (qds) 2628AA. A list of thirteen (13) plants of conservation concern that were previously recorded in the quarter degree square (qds) that the project area is situated in and for which suitable habitat is present within the study area is given in Appendix G1 (appendix c). None of the species that was short-listed to occur within the 20m mapped buffer, were recorded at the time of the site visit. The Wilds Park likely support a number of the species, however, not within the mapped 20m buffer. All activities here must be undertaken with careful consideration and include communication with the City Parks. Any route deviations within The Wilds must be re-assessed.

Fauna: Three Red Data shrew species are listed in Appendix G1 (appendix d). Although these have a dubious conservation ranking of DD (= Data Deficient),they are in fact robust insectivores; they appear to be rare but that is since they are operating at the apex of the trophic triangle and are therefore present in lesser numbers to retain the balance between predation and prey creatures, the latter predominantly invertebrates.

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.

NO✓

If YES, specify and explain:

Flora: A list of plants of conservation concern was compiled using information from the South African National Biodiversity Institute's (SANBI) checklist (SANBI, 2016b), Raimondo et al, (2009) and information received from the Gauteng Department of Agriculture and Rural Development (GDARD) for the quarter degree square (qds) 2628AA. A list of thirteen (13) plants of conservation concern that were previously recorded in the quarter degree square (qds) that the project area is situated in and for which suitable habitat is present within the study area is given in Appendix G1 (appendix c). None of the species that was short-listed to occur within the 20m mapped buffer, were recorded at the time of the site visit. The Wilds Park likely support a number of the species, however, not within the mapped 20m buffer. All activities here must be undertaken with careful consideration and include communication with the City Parks. Any route deviations within The Wilds must be re-assessed.

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

If YES, specify and explain:

Land Use, Cover and Ecological State

About 500m of the most northern section of the route falls within the Killarney Golf Course (**Figure 5).** From here the r aligns between a road and the western boundary of the road southwards. Most of the route is situated within built-up areas and following roads and road verges. About 2.7km could impact on vegetation and the class 4 ridge within the Park

Figure 5: Land cover along the proposed pipeline route (Google Earth imagery)

Photograph 1: Golf course and road verges in the northern extent of the route (red dashed line indicates approximate locality of the pipeline).

NEMBA Threatened or Protected Plant Species (TOPS): OPS listed species were recorded in The Wilds. Due to the sensitive nature of these species, the locality is not given. However, the species are situated outside of the mapped 20m buffer on the eastern section of The Wilds. It is unlikely that these species will be impacted on as the pipeline is proposed to run along the western section of Houghton Drive, impacting on a narrow strip of indigenous gardens within The Wilds west. Any route deviations here must be re-assessed.

Provincially Protected Plants: A number of provincially protected plants are listed in the Transvaal Nature Conservation Ordinance Act No. 12 of 1983. These plants are not to be removed, damaged, or destroyed without permit authorisation from Gauteng Department of Agriculture and Rural Development (GDARD). No provincially protected plant species was recorded within the mapped 20m buffer. However, these species are present within The Wilds and any route deviations here must be re-assessed.

National Protected Trees: *Podocarpus latifolius* (real yellowwood) was planted within The Wilds. This protected tree was planted within the parking area where it could be directly impacted on by construction of the pipeline. It was also recorded planted within the gardens of The Wilds-west, however, just outside of the mapped buffer area. Another *Podocarpus* were recorded within the sidewalk vegetation west of Killarney Golf Course. However, the route seems to run on the opposite side of Rivier Street in this area and it is unlikely to be directly impacted on. These trees may not be removed or damaged without a permit from DAFF. Any activities close to these trees must be communicated with the horticulturist responsible for The Wilds.

Wetland

A small artificial wetland was recorded north of The Wilds Park. This wetland lies approximately 750m south of the headwaters of the Sandspruit and is separated from the watercourse by the M11 and an intersection with Houghton Drive. Current site conditions reflect a landscaped wetland with no natural features. This wetland is therefore not assessed in this report. However, the Sandspruit has been canalised in underground pipes in this part of Johannesburg and a possibility remains that this wetland could be connected, or may have been connected, to the Sandspruit in the past.

A section of the Sandspruit lies western of the M1. Although some riparian and seepage characteristics do occur in this watercourse, it has been classified as a channelled valley bottom wetland in this report. **Figure 6** below shows the extent of delineated wetlands within the 500m DWS regulated area around the pipeline route.

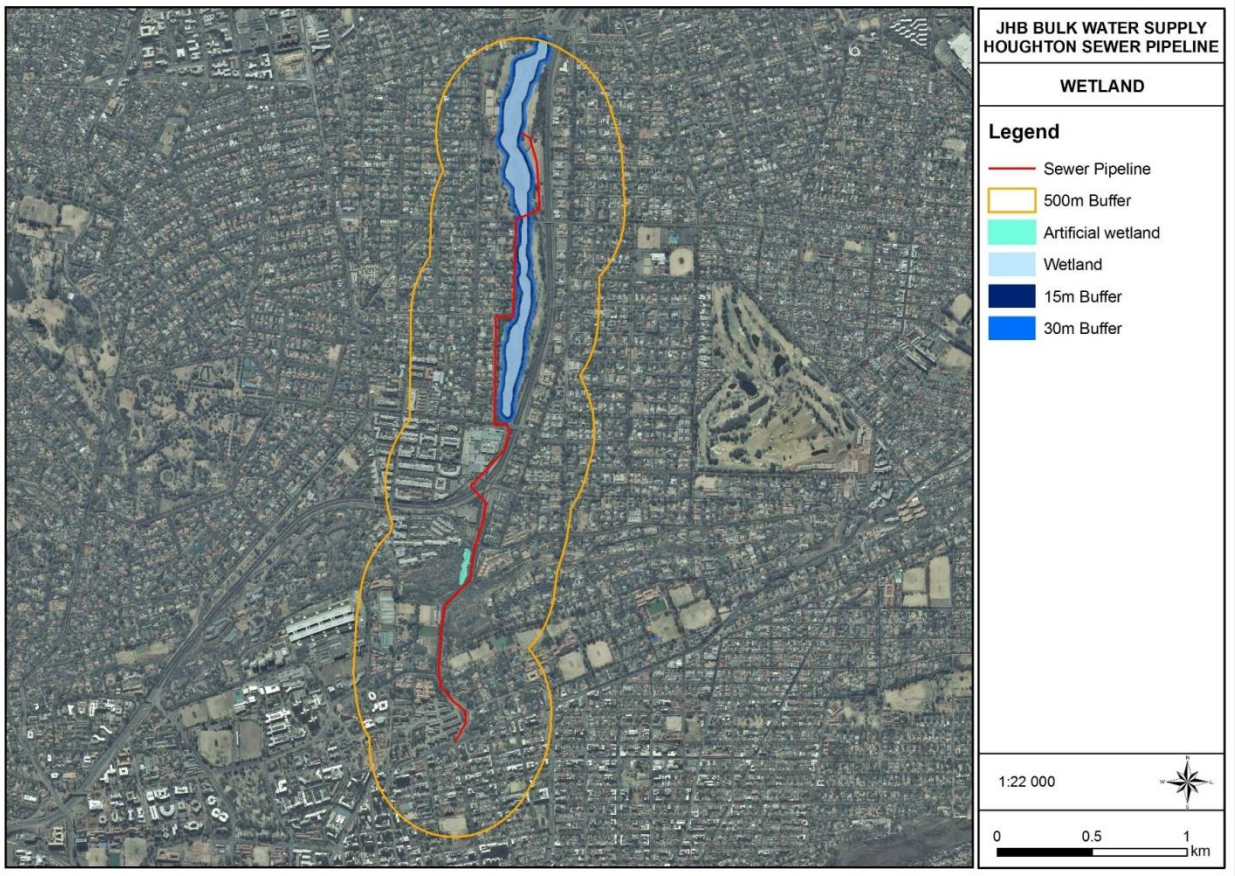


Figure 6: Delineated wetlands along the alignment of the pipeline

Wetland Functionality, Status and Sensitivity

The Present Ecological Status (**PES) scores for the Sandspruit is 7.1 E**. In this class the change in ecosystem processes and loss of natural habitat and biota is great but some remaining natural habitat features are still recognizable.

The wetlands achieved an Environmental Importance and Sensitivity category (EIS score which falls into a category characterised **by Low/Marginal importance and sensitivity**. Wetlands in this class are not ecologically important and sensitive at any scale. The biodiversity of these wetlands is ubiquitous and not sensitive to flow and habitat modifications. They play an insignificant role in moderating the quantity and quality of water in major rivers (DWAF, 1999).

Vegetation Overview

As per the Vegetation of South Africa, Lesotho and Swaziland (Mucina & Rutherford, 2006), the pipeline stretches over two biomes (**Table 2**).

Table 2: Biomes and vegetation types traversed by the pipeline (Mucina & Rutherford, 2006)

Biome	**Vegetation Type** ***Conservation status***	**Vegetation Characteristics**
Grassland	Egoli Granite Grassland *Endangered*	Species rich and comprise a patchy dominance of the grass *Themeda triandra*
Savanna	Gold Reef Mountain Grassland *Least Threatened*	Comprises open woody vegetation occurring on the west-east trending rocky hills and ridges of the North-West, Gauteng. Typical species include: *Senegalia caffra, Combretum molle, Protea caffra* and *Cheilanthes hirta*

The projects falls within a densely populated, built-up area including lawns, gardens and sidewalks. The pipeline traverses modified vegetation in the golf course, along road verges, prevents, and islands in the roads. The only natural and semi-natural vegetation present along the route was located within The Wilds Park. Houghton Drive divides the park in a western and eastern portion. The western portion, through which the pipeline traverses, included mowed lawns and planted trees, whereas the eastern portion is largely natural, representative of Gold Reef Mountain Bushveld. No grassland representative of Egoli Granite Grassland persists along the route and within the mapped 20m buffer. Each broad vegetation grouping is discussed below and geographically represented in **Figure 9**.

- Modified:
  1.1 Golf Course vegetation, including the channelled Sandspruit
  1.2 Sidewalks and built-up
  1.3 Planted road verges
- Semi-natural: Indigenous gardens (The Wilds); and
- Near-natural vegetation

Each broad vegetation grouping is discussed in **Appendix G1** and geographically represented in **Figure 7.**

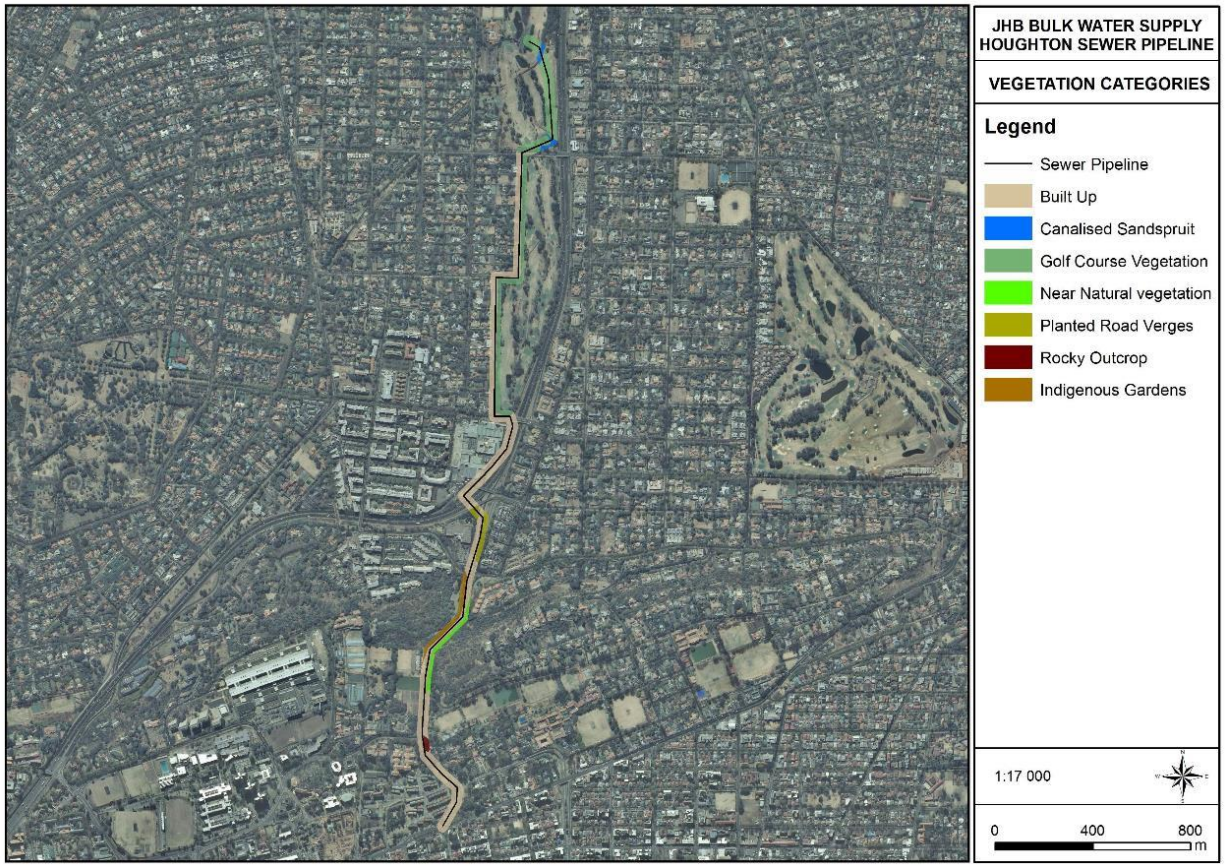


Figure 7: Vegetation associations along the route (mapped to 20m on either side of the route).

Ecological Sensitivity

In order to determine the vegetation condition and importance on the site, weighting scores were applied. Vegetation of conservation importance were classified based on the findings of the study and the criteria as listed in **Appendix G1**. The sensitivity analysis results were classified as per **Table 3**, geographically represented in **Figure 8** and discussed below.

Table 3: Scoring of vegetation that occur within the site

Broad vegetation community	Conservation Status of regional Vegetation* unit	Predominant state	Protection by legislation/ policies	Species of conservation concern	Ecological Function	Conservation Importance / unique habitat	Total Score out of max of 18	Importance and vulnerability
Modified: golf course and Sandspruit	2	1	0	0	2	1	**6**	**Low-medium**
Modified: sidewalks and built-up	n.a	0	0	0	1	1	**2**	**Low**
Planted Road verges	n.a.	1	0	0	1	2	**4**	**Low-**
The Wilds: Semi-natural Indigenous gardens	0	2	2	1	2	2	**9**	**Medium**

The Wilds: Near-natural vegetation	0	2	2	1	3	3	**11**	**Medium**
Rocky outcrop	0	2	2	1	1	2	**9**	**Medium**

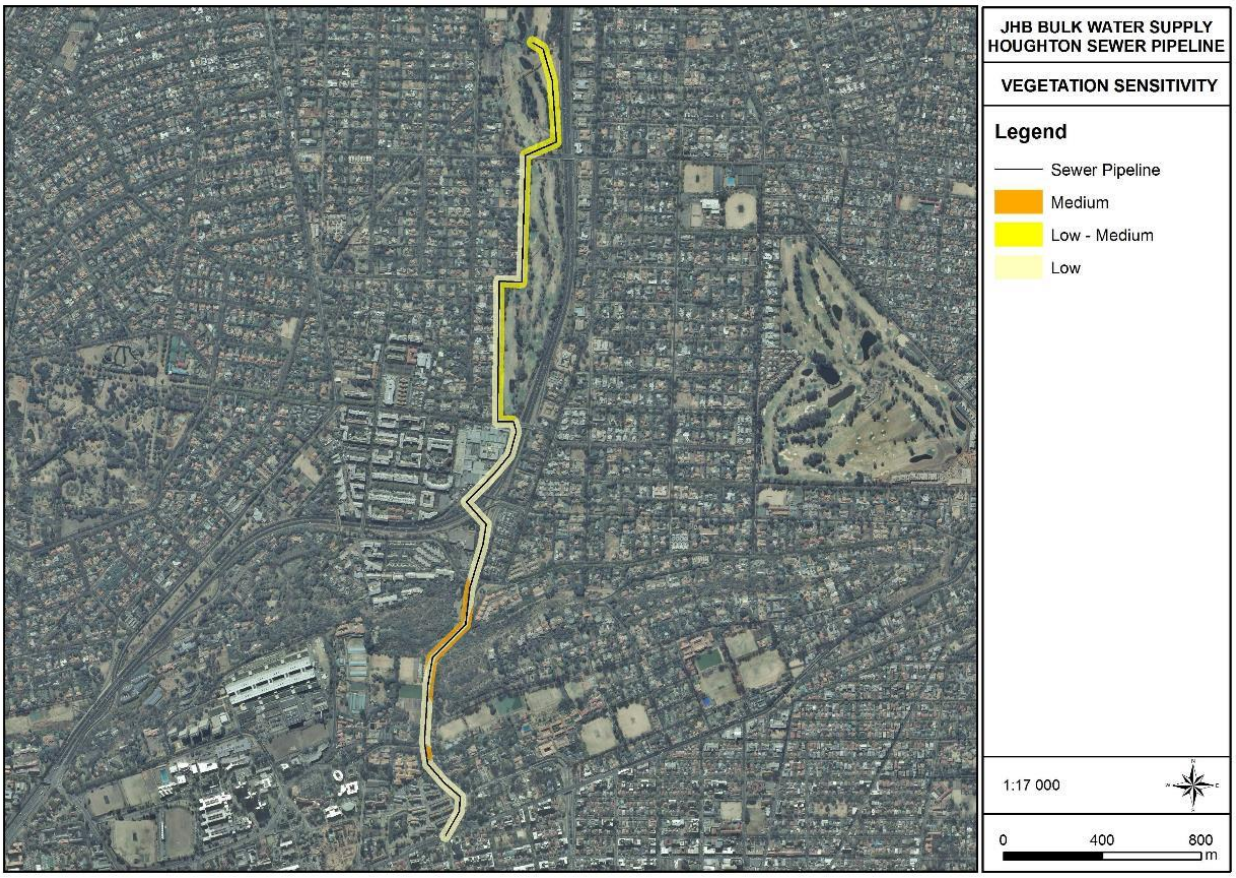


Figure 8: Sensitivity Map (mapped to 20m buffer around the route).

Medium-High sensitivity:

The Wilds includes natural vegetation representative of the Gold Reef Mountain Bushveld. In addition, it is the only remaining open space on a Class 4 ridge, falls within Critical Biodiversity Area (CBA) and is suitable habitat to a number of plant species of conservation concern. The Wilds is considered of high sensitivity, however, the portion mapped within the 20m buffer is situated along the boundary fence were historic impacts and disturbances took place. The area likely to be impacted on along the western section of Houghton Drive comprise indigenous gardens and it is unlikely that the eastern portion of The Wilds (east of Houghton Drive) will be impacted. In fact, it should be avoided.

The rocky outcrop just south of The Wilds is the only other remnant natural open space along the route. The rocky area includes a number of invasive plant species and included planted species not originally part of the Gold Reef Mountain Bushveld. The outcrop is situated east of Houghton Drive and unlikely to be directly impacted on.

Low-medium sensitivity:

The vegetation within the Killarney Golf Course and along the channelled Sandspruit are not in a natural state and

are not representative of the Egoli Granite Grassland that historically occurred in this area of Johannesburg. Other than some indigenous tree and grass species, the species composition has been compromised. However, the grassland function as open space, ground water recharges zones and soil stabilisation remains. These functions can be preserved as the modified grassland can be rehabilitated to the current status quo.

Low sensitivity:

The majority of the route traverse modified grassland that comprise mowed lawns and in some places, gardens and planted trees. The vegetation is modified from the reference state of Egoli Granite Grassland and Gold Reef Mountain Bushveld and the sidewalks and road verges can be rehabilitated to the current status quo post construction.

Ridges

These are protected environments within Gauteng (GDACE, 2006). Development on ridges and buffer zones of ridges are restricted, depending on the classification of each ridge. The Gauteng Development Guideline for Ridges (GDACE, 2006) classified ridges into four classes based on the percentage of the ridge that has been transformed.

The pipeline traverses a Class 4 ridge, which is mostly built-up. However, the section traversed by pipeline is situated in The Wilds Park and may include natural vegetation (**Figure 9**).

Figure 9: The pipeline traverses a class 4 ridge. A small portion of the ridge, not already transformed, will be traversed by the pipeline.

Gauteng Conservation Plan

According to the Gauteng Conservation Plan (version 3.3), the pipeline traverses and ESA in the north, comprising the open space and Sandspruit within the Killarney Golf Course. A CBA: Important Area coincides with the class 4

ridge and The Wilds Park (**Figure 10**). The CBAs are classified based on the presence of threatened and near-threatened plant and vertebrate species.

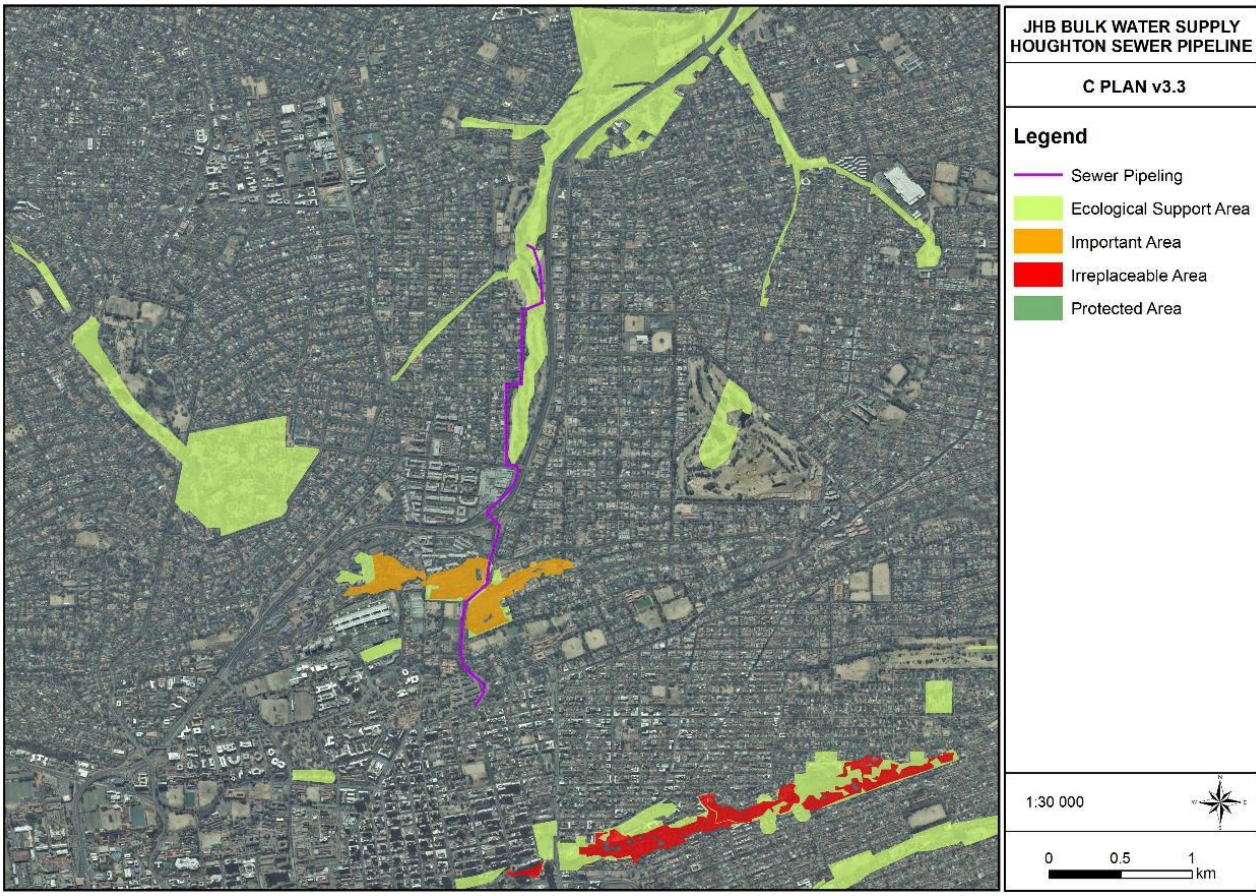


Figure 10: The site in relation to the Gauteng Conservation Plan

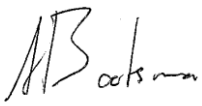
Was a specialist consulted to assist with completing this section If yes complete specialist details	**YES✓**

1.) Wetland Specialist

Name of the specialist:	Antoinette Bootsma

Qualification(s) of the specialist:	▪ MSc Ecology, University of South Africa (2017) Awarded with distinction. Project Title: Natural mechanisms of erosion prevention and stabilization in a Marakele peatland; implications for conservation management ▪ Short course in wetland soils, Terrasoil Science (2009) ▪ Short course in wetland delineation, legislation and rehabilitation, University of Pretoria (2007) ▪ B. Sc (Hons) Botany, University of Pretoria (2003-2005). Project Title: A phytosociological Assessment of the Wetland Pans of Lake Chrissie ▪ B. Sc (Botany & Zoology), University of South Africa (1997 - 2001)
Postal address:	
Postal code:	
Telephone: [redacted]	Cell: +27 83 4545 454
E-mail: antoinette@limosella.co.za	Fax: [redacted]

Are any further specialist studies recommended by the specialist?	[redacted] NO✓
If YES, specify:	**Yes**
If YES, is such a report(s) attached?	[redacted] NO✓
If YES list the specialist reports attached below	



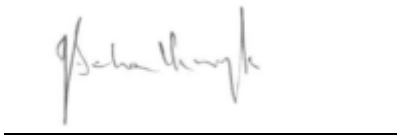
Signature of specialist:	Date: **May 2019**

2.) Heritage Specialist

Name of the specialist:	J van Schalkwyk
Qualification(s) of the specialist:	J A van Schalkwyk, D Litt et Phil, heritage consultant, has been working in the field of heritage management for more than 30 years. Based at the National Museum of Cultural History, Pretoria, he has actively done research in the fields of anthropology, archaeology, museology, tourism and impact assessment. This work was done in Limpopo Province, Gauteng, Mpumalanga, North West Province, Eastern Cape, Northern Cape, Botswana, Zimbabwe, Malawi, Lesotho and Swaziland. Based on this work, he has curated various exhibitions at different museums and has published more than 60 papers, many in scientifically accredited journals.
Postal address:	62 Coetzer Avenue, Monument Park, 0181
Postal code:	2194

Telephone:	[redacted]	Cell:	076 790 6777
E-mail:	jvschalkwyk@mweb.co.za	Fax:	[redacted]

Are any further specialist studies recommended by the specialist?	[redacted] NO ✓
If YES, specify:	N/A
If YES, is such a report(s) attached?	[redacted] NO ✓
If YES list the specialist reports attached below	
N/A	

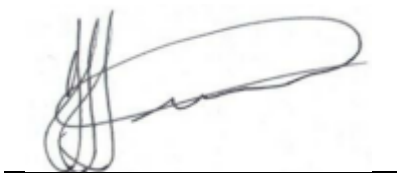
Signature of specialist:		Date:	**May 2019**

3.) Flora Specialist

Name of the specialist:	Antoinette Eyssell-Knox
Qualification(s) of the specialist:	• M.Sc Environmental Science, University of Pretoria (2010) Dissertation: *Land cover change and its effect on future land uses* • B. Sc (Hons) Horticulture, University of Pretoria (1999-2000) Dissertation: *Horticultural uses of the indigenous Barleria species* • B. Sc (Agriculture) Horticulture, University of Pretoria (1993-1996)
Postal address:	
Postal code:	

Telephone:	082 642 6295	Cell:	082 642 6295
E-mail:	Antoinette@dimela-eco.co.za	Fax:	[redacted]

Are any further specialist studies recommended by the specialist?	[redacted] NO ✓
If YES, specify:	N/A
If YES, is such a report(s) attached?	[redacted] NO ✓
If YES list the specialist reports attached below	
N/A	

Signature of specialist:		Date:	**May 2019**

4.) Fauna Specialist

Name of the specialist:	Jacobus, Casparus Petrus van Wyk and Ignatius Lourens Rautenbach

Qualification(s) of the specialist:	• hold higher degrees in the biological sciences, which allowed registration by S.A. Council for National Scientific Professions (SACNASP) as Professional Zoologists that sanction us to function independently as specialist scientific consultants; • declare that as per prerequisites of the Natural Scientific Professions Act No. 27 of 2003 this project was our own work from inception and reflects exclusively our observations and unbiased scientific interpretations, and executed to the best of our abilities; • abide by the Code of Ethics of the SACNASP; are committed to biodiversity conservation but concomitantly recognize the need for economic development. Whereas we appreciate opportunities to learn through constructive criticism and debate, we reserve the right to form and hold our own opinions within the constraints of our training, experience and results and therefore will not submit willingly to the interests of other parties or change our statements to appease or unduly benefit them;
Postal address:	
Postal code:	

Telephone:	012 3334112	Cell:	082 3351288
E-mail:	naasrauten@mweb.co.za	Fax:	

Are any further specialist studies recommended by the specialist?	**NO ✓**
If YES, specify:	**N/A**
If YES, is such a report(s) attached?	**NO ✓**
If YES list the specialist reports attached below	
N/A	

Signature of specialist:		Date:	**May 2019**

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

Proposed Activity:

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	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.

Site 

NORTH

Note:

WEST

8; 9, 11	**8; 9**	**2, 21**	**8; 9, 21**	**8; 9**
8; 9	**8; 9**	**2, 21**	**8; 9, 21**	**8; 9**
8; 9	**8; 9**	**2, 21**	**8; 9, 17, 25**	**8; 9**
8; 9	**12, 17**		**8; 9, 17, 25**	**8; 9**
8; 9	**4; 5, 12; 13**	**2; 4**	**4; 5, 25**	**8; 9, 17**
8; 9	**8; 9; 1319**	**2**	**8; 9; 19**	**8; 9**

EAST

SOUTH

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

***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	**YES✓**
If yes indicate the type of reports below	
• Fauna & Flora Report • Wetland Assessment & Wetland Rehabilitation Plans • Heritage Assessment Report	
The above specialists reports are attached within **Appendix G** of this report	

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 project is located in **Region E & F** of the City of Johannesburg (CoJ) within **Ward 67 and 73**, the following socio-economics characteristics are pertinent to the site:

Population: Understanding both the age as well as anticipated population growth of the city assists in planning for the anticipated demand for services and job opportunities. The CoJ has a population of approximately 4 million made up primarily of a young population aged between 30 and 39 years. This total population translates into roughly 1.3 million households. The city's population is projected to increase to about 4.1 million in 2015 implying an annual rate of growth of the population of about 1.3% per annum by 2015. Household projections further indicate that the number of households in the City is likely to increase from about 1.3 million in 2010 to about 1.5 million in 2015 with an average household size of about 3 persons. The region is home to more than 250 000 residents, most of whom are concentrated in Midrand. The western part of the region is scarcely populated, though some 56 000 people reside in the township of Diepsloot alone (CoJ, 2018), ward is made up of 35 205 inhabitants**.**

Economic Profile of local Municipality: The City' of Johannesburg` s economy is driven primarily by four economic sectors which are: (a) finance and business services, (b) community services, (c) manufacturing, and (d) trade. These four economic sectors collectively account for more than 82% of economic activity within the City.

Level of Unemployment: The CoJ had high unemployment levels of 23.1% in 2010/2011. Regions E, B have one of the lowest rates of unemployment at 2.3% and 9.2% respectively. Youth unemployment remains a major challenge both nationally and for the city. Low education levels and slow formal sector growth are two of the major causes of youth unemployment. The vast majority of the youthful population in Johannesburg has only a matric certificate preventing access to the labour market (CoJ IDP 2012/2016).

Provision of Basic Service: The provision of (and access to) basic services such as electricity, water, adequate sanitation, etc. is critical for the pathway to poverty reduction, and to some extent, inequality – as these have an impact on the quality of life. Access to basic services is relatively high in Johannesburg (with over 95% of households enjoying access to piped water, flush toilets, and electricity); however, there is still a significant proportion of the population without the capacity / means to access or optimally benefit from these services. This could be attributed to increasing inward migration, rapid urbanisation, and the associated growth in the number of households which require services. It is also important to bear in mind that chronically poor households find it difficult, and often cannot pay for basic services.

(https://www.joburg.org.za/documents_/Documents/Issue%202_The%20Socio%20Economic%20Status%20of%20the%20City%20of%20Johannesburg.pdf)

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 categorized as-

(a) the construction of a road, wall, power line, 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?	**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:

During the physical survey, the following sites, features and objects of cultural significance were identified in the study area.

- Stone Age: No sites, features or objects of cultural significance dating to the Stone Age were identified in the study area
- Iron Age: No sites, features or objects of cultural significance dating to the Iron Age were identified in the study area.
- Historic period: No sites, features or objects of cultural significance dating to the historic period were identified in the study area

Although the region is known for its large number of old houses, some of which are declared provincial heritage sites, as well as sites of natural heritage significance (The Wilds), these would not be impacted on by the proposed development, as all the activities would take place in the road reserves. As no sites, features or objects of cultural significance are known to exist in the development area, there would be no impact as a result of the proposed development.

From a heritage point of view, it is recommended that the proposed development be allowed to continue on acceptance of the conditions proposed. Should archaeological sites or graves be exposed in other areas during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.

Will any building or structure older than 60 years be affected in any way?	**NO ✓**
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?	**NO ✓**

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

SECTION C: PUBLIC PARTICIPATION (SECTION 41)

1. THE ENVIRONMENTAL ASSESSMENT PRACTITIONER MUST CONDUCT PUBLIC PARTICIPATION PROCESS IN ACCORDANCE WITH THE REQUIREMENT OF THE EIA REGULATIONS, 2014.

2. 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✓
If yes, has any comments been received from the local authority?	NO✓

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

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

The Draft Report has been submitted to the City of Johannesburg (CoJ) for comment. If any issues and comments are received, these will be collated and responded to. These responses will be incorporated into the Final BAR. The Public Participation Process is currently underway. Once concluded, the issues and comments raised by I&AP will be collated and responded to. These responses will be incorporated into the Final BAR.

3. 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✓

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

1. Stormwater Control & proximity to sewers
2. How will the sewer be replaced?
   - 2.1 Completely new sewer i.e. long trench and dig
   - 2.2 In sections? If so, holes for each connections
   - 2.3 What about sewers to each dwelling
3. I noticed that at one point the sewer line crosses through KCC golf course. Please can we arrange a meeting on site to determine the exact location of this pipe to forge a way forward and to assess the impact this will have on my business. Please advise when we can meet to accurately measure these factors.

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

4. 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 authorization 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.

5. 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 to I&APs
Appendix 3 – Proof of newspaper advertisements
Appendix 4 –Correspondences with I&APs
Appendix 5 – Minutes of any public and/or stakeholder meetings – **this is anticipated during the Draft BAR review period**
Appendix 6 - Comments and Responses Report
Appendix 7 –Comments from I&APs on Basic Assessment (BA) Report - **Comments are anticipated during the Draft BAR review period**
Appendix 8 –Comments from I&APs on amendments to the BA Report **N/A**
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
4) Each alterative needs to be clearly indicated in the box below
5) Attach the above documents in a chronological order

Section D has been duplicated for alternatives | **0** | times

(Complete only when appropriate)

Section D Alternative No. | | (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✓**

If yes, what estimated quantity will be produced per month? Could not be determined at this stage

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

Some construction rubble/ solid waste will arise from demolition of existing building. This solid waste will be temporarily stored on site in designated waste skips or stockpiles and then reused where possible for backfill. Surplus material will be removed by an appropriate waste contractor appointed by the main construction contractor to an approved landfill site. This will be managed through the EMPr.

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

General waste removed from site will be disposed of at a suitably licensed disposal facility.. Safe disposal certificates must be obtained and kept on site for the duration of the construction phase.

Will the activity produce solid waste during its operational phase? YES✓

If yes, what estimated quantity will be produced per month? `m^3

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

Some construction rubble/ solid waste will arise from demolition of existing building. This solid waste will be temporarily stored on site in designated waste skips or stockpiles and then reused where possible for backfill. Surplus material will be removed by an appropriate waste contractor appointed by the main construction contractor to an approved landfill site. This will be managed through the EMPr.

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? NO ✓

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

During both construction and operation phase a registered landfill sites within the study area can be used as they still have capacity.

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? If yes, inform the competent authority and request a change to an application for scoping and EIA.	**NO ✓**
Is the activity that is being applied for a solid waste handling or treatment facility? 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.	**NO ✓**

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

During Construction, wastes must be separated at source into recyclable and non-recyclable materials and distributed for recycling where applicable. During the construction phase, construction waste rubble should be re-used as fill material, erosion protection and gabion construction where possible. The re-use of construction waste materials will minimize the amount of waste that will need to be disposed of at registered municipal waste facilities. In addition, there will be extensive earthworks, but import and export of material will be minimised by balancing cut and fill requirements as far as possible.

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?	**NO ✓**	
If yes, what estimated quantity will be produced per month?	N/A 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 onsite?	**NO ✓**
If yes, what estimated quantity will be produced per month?	N/A m3

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

N/A

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? **NO ✓**

If yes, provide the particulars of the facility:

Facility name:	N/A		
Contact person:	N/A		
Postal address:	N/A		
Postal code:	N/A		
Telephone:	N/A	Cell:	
E-mail:	N/A	Fax:	

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

N/A

Liquid effluent (domestic sewage)

Will the activity produce domestic effluent that will be disposed of in a municipal	**NO✓**

sewage system?		
If yes, what estimated quantity will be produced per month?		
If yes, has the municipality confirmed that sufficient capacity exist 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✓**	

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

Chemical toilets are going to be used and the sewage waste will be collected by the Contractor on for treatment at a treatment facility.

Emissions into the atmosphere

Will the activity release emissions into the atmosphere?	**YES✓**	
If yes, is it controlled by any legislation of any sphere of government?		**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 construction, there will be localized liberation of dust due to excavations and the hauling of materials around the site. Localised exhaust emissions will also occur, however a significant increase in concentrations of hydrocarbons, nitrogen oxides and carbon monoxide is not anticipated. During the operation phase there is likely to be localised petrol fumes in the immediate vicinity of the fuel pumps as is characteristic of a typical filling station. Increased emissions may occur due to increased traffic in the vicinity of the filling station

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 process itself 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: litters

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✓**	

If yes, list the permits required

The pipeline will be crossing a watercourse. It is for such reasons that a Water Use License application process has been initiated for the development. According to the National Water Act (NWA), 1998 (Act No.36 of 1998), the proposed development requires a Water Use License as per the following regulations:

- Section 21(c): impeding or diverting the flow of water in a watercourse and;
- Section 21 (i): altering the bed, banks, course or characteristics of a watercourse.

If yes, have you applied for the water use permit(s)?		**NO✓**
If yes, have you received approval(s)? (attached in appropriate appendix)		

3. POWER SUPPLY

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

The development will not require power supply during its operation phase. However generators will be used as a source of power if needed during the construction phase.

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

Please see above.

4. ENERGY EFFICIENCY

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

In other activities (construction and operation) the scope of work will be structured in a way that, where possible, the use of labour intensive methods will be employed. Not only will it serve the local community but it also saves the use of Pneumatic Equipment that requires a lot of energy input.

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

The proposed development is not an energy-intensive development that will require energy/electricity input for its continued operations and will therefore not consume energy during its operation phase.

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

Summaries the issues raised by interested and affected parties.

1. Stormwater Control & proximity to sewers
2. How will the sewer be replaced? Completely new sewer i.e. long trench and dig
3. In sections? If so, holes for each connections
4. What about sewers to each dwelling
5. I noticed that at one point the sewer line crosses through KCC golf course. Please can we arrange a meeting on site to determine the exact location of this pipe to forge a way forward and to assess the impact this will have on my business. Please advise when we can meet to accurately measure these factors.

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):

1. JW would like to come back to you regarding this, but Johannesburg Water does check with JRA to get the location of the Stormwater systems, but normally new sewers are constructed further away from the road edge to have less interference with road and stormwater infrastructure.
2. The section of sewer pipe that will be diverted to River Street will be a completely new sewer with long open trench excavations. This section is on River Street between 8th Avenue and 11th Avenue, as well as in the Golf Course between manholes 9 and 11 as per the current layout drawings (Appendix C)
3. The rest of the project being pipe cracking will be done per section, with launch and reception pits only being excavated
4. Sewer house connections where affected will be excavated and reconnected to the upgraded sewer
5. Your concern is noted and forwarded to JW and I agree that a meeting with all parties involved is necessary in this regard. Let me get some available dates from JW project manager and will revert to you on this with possible meeting dates before the end of the month.

2. IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION AND OPERATIONAL PHASE

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

The purpose of impact assessment is to assign relative significance to predicted impacts associated with the project, and to determine the manner in which impacts are to be avoided, mitigated or managed. The potential environmental impacts were identified based on the nature of the receiving environment, a review of the proposed activities, and the issues raised in the public participation process.

The potential impacts of the proposed development were identified through a site visit, the Environmental Assessment Practitioners experience and expertise in the field and specialist study reports. In the Basic Assessment Report, the potential impacts are broadly identified and outlined. An assessment of the potential impacts is provided, identifying the impacts that are potentially significant and recommending management and mitigation measures to

reduce the impacts. In general, it is recognized that every development has the potential to pose various risks to the environment as well as to the residents or businesses in the surrounding area. Therefore, it is important that these possible risks are taken into account during the pre-construction phase of the development.

In accordance with the requirements from the EIA Regulations 2014 GN 982, Regulation 19 (3) and as set out in Appendix 1, the following impacts of the issues identified through the basic assessment phase were assessed in terms of the following methodology. All impacts are assessed according to the following criteria.

- The **nature**, a description of what causes the effect, what will be affected, and how it will be affected.
  - The **extent**, wherein it is indicated whether the impact will be local (limited to the immediate area or site of development), regional, national or international. A score of between 1 and 5 is assigned as appropriate with
  - a score of 1 being site specific,
  - 2 = local (site + immediate surrounds),
  - 3 = regional (the impact could affect the area including the neighbouring farms, the transport routes and the adjoining towns) ,
  - 4 = national and
  - a score of 5 being international (where the impact has international ramifications that extend beyond the boundaries of South Africa).

- The **duration**, wherein it is indicated whether:
  - The lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
  - The lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2;
  - Medium-term (5–15 years) – assigned a score of 3;
  - Long term (> 15 years) - assigned a score of 4; or;
  - Permanent - assigned a score of 5.

- The **magnitude**, quantified on a scale from 0-10, where a score is assigned:
  - 0 is small and will have no effect on the environment;
  - 2 is minor and will not result in an impact on processes;
  - 4 is low and will cause a slight impact on processes;
  - 6 is moderate and will result in processes continuing but in a modified way;
  - 8 is high (processes are altered to the extent that they temporarily cease); and
  - 10 is very high and results in complete destruction of patterns and permanent cessation of processes.

- The **probability** of occurrence, which describes the likelihood of the impact actually occurring. Probability is estimated on a scale, and a score assigned:
  - Assigned a score of 1–5, where 1 is very improbable (probably will not happen);
  - Assigned a score of 2 is improbable (some possibility, but low likelihood);
  - Assigned a score of 3 is probable (distinct possibility);
  - Assigned a score of 4 is highly probable (most likely); and
  - Assigned a score of 5 is definite (impact will occur regardless of any prevention measures).

- The **significance**, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high.

- The **status**, which is described as positive, negative or neutral.
- The degree to which the impact can be reversed.
- The degree to which the impact may cause irreplaceable loss of resources.
- The degree to which the impact can be mitigated.

The **significance** is determined by combining the criteria in the following formula:
S= (E+D+M) P; where

S = Significance weighting
E = Extent
D = Duration
M = Magnitude
P = Probability

The **significance** weightings for each potential impact are as follows:

- **< 30 points**: **Low** (i.e. where this impact would not have a direct influence on the decision to develop in the area),
- **30-60 points**: **Medium** (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- **>60 points**: **High** (i.e. Impact is significant, mitigation is critical to reduce impact or risk. Resulting impact could influence the decision depending on the possible mitigation. An impact which could influence the decision about whether or not to proceed with the project.).

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 and OPERATION PHASE** for the various alternatives of the proposed development. This must include an assessment of the significance of all impacts.

2.1 IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Table 4: A summary of anticipated significance of the potential direct, indirect and cumulative impacts that is likely to occur as a result of the **CONSTRUCTION PHASE** for pipe cracking and the open trench excavation methods.

<table>
<tr><th>Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr><td colspan="3">IMPACT ON WETLANDS</td></tr>
<tr><td>Nature of the Impact: Changes in water flow regime impact ratings

Activity: The replacement of sewage pipes will occur within the delineated wetland an its buffer. Any earthworks will affect water flow

<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Definite (5)</td><td>Highly Probable (4)</td></tr>
<tr><td>Duration</td><td>Medium term (3)</td><td>Short term (2)</td></tr>
<tr><td>Extent</td><td>Regional (3)</td><td>Limited to Local Area (2)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>60 (High)</td><td>32 (Medium)</td></tr>
<tr><td>Status (positive, negative or neutral)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td><td>• Implement best practice mitigation measures
• Ensure effective stormwater management
• Ensure effective rehabilitation after closure of the trench so that the topography of the watercourse is returned to its pre-development condition</td><td>Changes in the hydrology of the wetland is unlikely if adequate design and rehabilitation are implemented</td></tr>
<tr><td>Nature of the Impact: Changes in sediment entering and exiting the</td><td>• A temporary fence or demarcation must be erected around No-Go Areas outside the</td><td>High since reversing sediment</td></tr>
</table>

<table>
<tr><th>Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr><td>system.

Activity: Changing the amount of sediment entering the water resource and associated change in turbidity (increasing or decreasing the amount). Construction and maintenance activities will result in earthworks and soil disturbance as well as the disturbance of natural vegetation within the wetland channel. Activity include:
• Clearing of surface vegetation will expose the soils within, which in rainy events would wash through the watercourse, causing sedimentation.
• Trenching in the wetland and its buffer zone.

<table><tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr><tr><td>Probability</td><td>Definite (5)</td><td>Highly Probable (4)</td></tr><tr><td>Duration</td><td>Medium term (3)</td><td>Short term (2)</td></tr><tr><td>Extent</td><td>Regional (3)</td><td>Limited to Local Area (2)</td></tr><tr><td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr><tr><td>Significance</td><td>60 (High)</td><td>32 (Medium)</td></tr><tr><td>Status (positive, negative or neutral)</td><td>Negative</td><td>Negative</td></tr></table></td><td>proposed works area prior to any construction taking place as part of the contractor planning phase when compiling work method statements to prevent access to the adjacent portions of the watercourse.
• Effective stormwater management should be a priority during the construction phase. This should be monitored as part of the EMP.
• Sediment control should be effective and not allow any release of sediment pollution downstream. This should be audited on a weekly basis to demonstrate compliance with upstream conditions.</td><td>pollution is unlikely and the impacts to the Sandspruit River are already significant.</td></tr>
<tr><td>Nature of the Impact: Introduction and spread of alien vegetation.

• The moving of soil and vegetation resulting in opportunistic invasions after disturbance and the introduction of seed in building materials and on vehicles. Invasions of alien plants can impact on hydrology, by reducing the quantity of water entering a</td><td>• Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area and returning it where possible afterwards.
• Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance and take immediate corrective action where invasive species are observed to establish.</td><td>Expected to be Moderate due to large extent of exotic vegetation in the area.</td></tr>
</table>

<table>
<tr><th>Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr><td>watercourse, and outcompete natural vegetation, decreasing the natural biodiversity. Once in a system alien invasive plants can spread through the catchment. If allowed to seed before control measures are implemented alien plans can easily colonise and impact on downstream users. The high density and abundance of alien plants in the watercourse increase the risk of dispersal of seeds already present in the soil.

<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Definite (5)</td><td>Highly Probable (4)</td></tr>
<tr><td>Duration</td><td>Medium term (3)</td><td>Short term (2)</td></tr>
<tr><td>Extent</td><td>Regional (3)</td><td>Limited to Local Area (2)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>60 (High)</td><td>32 (Medium)</td></tr>
<tr><td>Status (positive, negative or neutral)</td><td>Negative</td><td>Negative</td></tr>
</table></td><td>• Rehabilitate or revegetate disturbed areas</td><td></td></tr>
<tr><td>Nature of the Impact: <u>Loss and disturbance of wetland habitat and fringe vegetation.</u>

• Earthworks and trenching in the delineated wetland and its buffer zone will necessarily lead to the loss of wetland habitat and fringe vegetation

<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Definite (5)</td><td>Highly Probable</td></tr>
</table></td><td>• Rehabilitation of disturbed wetland habitat is key to the management of environmental impacts on this project. Refer to the accompanying rehabilitation and monitoring plan for details on the steps to be implemented during rehabilitation.</td><td>Expected to be moderate provided that the mitigation measures are implemented correctly and effective control of alien species on the site is undertaken where necessary.</td></tr>
</table>

<table>
<tr><th>Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr><td>
<table>
<tr><td></td><td></td><td>(4)</td></tr>
<tr><td>Duration</td><td>Medium term (3)</td><td>Short term (2)</td></tr>
<tr><td>Extent</td><td>Regional (3)</td><td>Limited to Local Area (2)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Moderate (6)</td></tr>
<tr><td>Significance</td><td>60 (High)</td><td>40 (Medium)</td></tr>
<tr><td>Status (positive, negative or neutral)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td><td></td><td></td></tr>
<tr><td>Nature of the Impact: <u>Changes in water quality due to foreign materials and increased nutrients.</u>

• Construction and operational activities may result in the discharge of solvents and other industrial chemicals, leakage of fuel/oil from vehicles and the disposal of sewage resulting in the loss of sensitive biota in the wetlands/rivers and a reduction in watercourse function. During the operational phase sewage spills could occur although it is likely that the infrastructure upgrade will improve the current pollution from input of sewage into the watercourse.

<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Probable (3)</td></tr>
<tr><td>Duration</td><td>Medium-term (3)</td><td>Short-term (2)</td></tr>
<tr><td>Extent</td><td>Limited to Local Area (2)</td><td>Local (2)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>33 (moderate)</td><td>24 (Low)</td></tr>
<tr><td>Status (positive, negative or</td><td>Negative</td><td>Negative</td></tr>
</table>
</td><td>• Provision of adequate sanitation facilities located outside of the watercourse or its associated buffer zone.
• Implementation of appropriate stormwater management around the excavation to prevent the ingress of run-off into the excavation and to prevent contaminated runoff into the watercourse.
• After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land shall be left in a condition as close as possible to that prior to use.
• Maintenance of construction vehicles / equipment should not take place within the watercourse or watercourse buffer.
• Control of waste discharges and do not allow dirty water from operational activities to enter the watercourse
• Treatment of pollution identified should be prioritized accordingly.</td><td>Expected to be low since the pipeline should improve the current pollution status by reducing sewage input into the wetland.</td></tr>
</table>

<table>
<tr><th>Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr><td>
<table>
<tr><td>neutral)</td><td></td><td></td></tr>
</table>
</td><td></td><td></td></tr>
<tr><td colspan="3">IMPACT ON VEGETATION</td></tr>
<tr><td>
Nature of the Impact: <u>Destruction of vegetation of low-medium and medium sensitivity</u>

The development will require the removal of the modified grassland within the golf course as well indigenous gardens within The Wilds. All removal of vegetation, whether sensitive or not, could have an impact on soil stabilisation and water infiltration.

The sources of this impact could include:
• Clearing of and damage to vegetation in construction footprint, access roads, construction camps, vehicle / machinery traffic and trampling by workers;
• Illegal disposal and dumping of construction material such as cement or oil, as well as maintenance materials during construction.
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Definite (5)</td><td>Probable (3)</td></tr>
<tr><td>Duration</td><td>Permanent (5)</td><td>Permanent (5)</td></tr>
<tr><td>Extent</td><td>Limited to Site (1)</td><td>Limited to Site (1)</td></tr>
<tr><td>Magnitude</td><td>Low (4)</td><td>Minor (2)</td></tr>
<tr><td>Significance</td><td>50 (medium)</td><td>24 (low)</td></tr>
<tr><td>Status (positive, negative or neutral)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td><td>
<u>Planning:</u>
• The route through The Wilds must be limited to the boundary fence area on the western side of Houghton Drive.
• Killarney Golf Course: the Golf Course manager should be consulted in advance to inform rehabilitation guidelines for the golf course.
• No construction camps or storage areas may be located in The Wilds. No heavy vehicles should be allowed within The Wilds.
• Construction camps can be placed within road verges, but these areas must be rehabilitated to the current status quo, including indigenous lawns and trees. Plan to remove as little indigenous trees as possible, if any.

<u>Construction:</u>
• An independent Ecological Control Officer (ECO) should be appointed to oversee construction.
• A temporary fence or demarcation must be erected around the construction area to prevent access to adjacent grasslands
• Prohibit vehicular or pedestrian access into natural areas beyond the demarcated boundary of the construction area.
• No open fires are permitted within naturally vegetated areas.
• Formalise access roads and make use of existing roads and tracks where feasible, rather than creating new routes through naturally vegetated areas.
• Only remove vegetation where absolutely necessary and retain vegetation in place for as long as possible prior to removal.
• A vegetation rehabilitation plan should already be implemented during construction and include the following:
• In vegetated areas, grass sods should be removed and stored in transformed vegetation or other disturbed areas. The sods must preferably be removed during the winter months and be replanted by latest springtime. The sods should not be stacked on top of each other. Once construction is completed, these sods should be used to rehabilitate the disturbed areas from where they have been removed. In the absence of timely rainfall, the sods should be watered well after planting and at least twice more over the next 2 weeks.
• Grasses that naturally occur in the area should be sown / hydroseeded in the disturbed footprint.
</td><td>
Localised alteration of soil surface characteristics and loss of flora.
Edge effects into The Wilds Park
</td></tr>
</table>

<table>
<tr><th>Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr><td></td><td>• Construction workers may not remove flora and neither may anyone collect seed from the plants without permission from the local authority.
• No activities should take place during rainy events and at least 2 days afterwards.
• Where topsoil needs to be removed, store such in a separate area where such soils can be protected until they can be re-used for post-construction rehabilitation where applicable. Never mix topsoils with subsoils or other spoil materials.
• Maintain site demarcations in position until the cessation of construction work.
• 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 must take place immediately post construction and only use indigenous species naturally occurring in the area.</td><td></td></tr>
<tr><td>Nature of the Impact: <u>Destruction of vegetation within The Wilds and rocky outcrop</u>

Plant species of conservation concern and protected plants occur within The Wilds. The proposed pipeline route and 20m buffer is unlikely to be habitat to these species due to its occurrence along boundary fences and historical impacts. However, the remainder of The Wilds are habitat to plant species of conservation concern and should not be impacted on.

<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Improbable (2)</td></tr>
<tr><td>Duration</td><td>Medium-term (3)</td><td>Short-term (2)</td></tr>
<tr><td>Extent</td><td>Limited to Local Area (2)</td><td>Limited to site (1)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>33 (medium)</td><td>14 (low)</td></tr>
<tr><td>Status (positive, negative or</td><td>Negative</td><td>Negative</td></tr>
</table>
</td><td><u>Planning Phase:</u>
• The ECO and foreman must be introduced to and be in constant communication with the City Parks horticulturist responsible for The Wilds.
• The route through The Wilds must be limited to the boundary fence area on the western side of Houghton Drive. Any route deviations that could impact on The Wilds must be re-assessed.
• No construction camps or storage areas may be located in The Wilds.
• No heavy vehicles should be allowed within The Wilds.
• Rehabilitation of the vegetation within The Wilds must be done in accordance with the guidelines set by City Parks and the relevant horticulturist and must be discussed prior to commencement of activities.
• The rocky outcrop situated south of The Wilds (at the intersection of Houghton Drive and Carse O'Gowrie Road) should ideally not be impacted on. The current route aligns along the road and sidewalk and is unlikely to directly impact on it. If the route is re-aligned or found to impact directly on this outcrop, the specialist should be granted access to the rocky outcrop and re-assess this section within the growing period of plant species of conservation concern that may potentially occur.

<u>Construction:</u></td><td>failed rehabilitation and invasion of the disturbance footprint by alien invasive plant species</td></tr>
</table>

<table>
<tr><th>Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr><td>
<table>
<tr><td>neutral)</td><td></td><td></td></tr>
</table>
</td><td>
• Mitigation measures as set out in 7.2.1 must be adhered to in The Wilds.
• No activities should extent to the eastern side of The Wilds.
• No plant species may be removed from The Wilds.
• Tree roots damaged by digging trenches must be treated with an appropriate fungicide or sealant, in accordance with specifications of The Wilds' horticulturist.
</td><td></td></tr>
<tr><td>
Nature of the Impact: Potential increase in invasive vegetation

The seed of alien invasive plant species that occur on and in the vicinity of the construction areas could spread into the disturbed and stockpiled soil. Also, the construction vehicles and equipment were likely used on various other sites and could introduce alien invasive plant seeds or indigenous plants not belonging to this vegetation unit to the construction site. this is of particular concern at The Wilds.

<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Highly probable (4)</td><td>Probable (3)</td></tr>
<tr><td>Duration</td><td>Long-term (4)</td><td>Short-term (2)</td></tr>
<tr><td>Extent</td><td>Local Area (2)</td><td>Site bound (1)</td></tr>
<tr><td>Magnitude</td><td>High (8)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>56 (medium)</td><td>21 (low)</td></tr>
<tr><td>Status (positive, negative or neutral)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td><td>
• Alien invasive species, in particular category 1b species that were identified on site must be removed from the development footprint and immediate surrounds, prior to construction or soil disturbances. By removing these species, the spread of seeds will be prevented into disturbed soils which could thus have a positive impact on the surrounding natural vegetation.
• All alien seedlings and saplings must be removed as they become evident for the duration of construction.
• All construction vehicles and equipment, as well as construction material should be free of plant material. Therefore, all equipment and vehicles should be thoroughly cleaned prior to access on to the construction areas. This should be verified by the ECO.
• If filling material is to be used, this should be sourced from areas free of invasive species.
• No foreign plant matter or soil may be introduced into The Wilds.
</td><td>Re-infestation in areas initially cleared.</td></tr>
<tr><td>
Nature of the Impact: Clearing of land for construction camps and potential pollution of the soil and water

These may be at one or several locations, area will be cleared and
</td><td>
Planning:
• Construction camps must be located outside of areas classified as medium sensitivity and not within the Killarney Golf Course or in proximity to the Sandspruit.
•
</td><td>Compaction on construction camps could result in altered topsoil characteristics and vegetation composition. These areas are also</td></tr>
</table>

<table>
<tr><th>Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr><td>levelled where necessary, site offices may be temporary structures, machinery, building supplies and temporary staff facilities (excluding accommodation) will be housed here. The impacts could include:
Removal of vegetation
Levelling and compaction of soils
Storage of machinery, supplies and staff facilities
• This could lead to the loss of vegetation and/or species of conservation concern, alteration and loss of microhabitats, altered vegetation cover, increased erosion and contamination of soil and groundwater.

<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Improbable (2)</td></tr>
<tr><td>Duration</td><td>Medium-term (3)</td><td>Short-term (2)</td></tr>
<tr><td>Extent</td><td>Local Area (2)</td><td>Site bound (1)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>33 (moderate)</td><td>14 (low)</td></tr>
<tr><td>Status (positive, negative or neutral)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td><td>Construction:
• Prevent spillage of construction material and other pollutants, contain and treat any spillages immediately, strictly prohibit any pollution/littering. Ensure there is a method statement in place to remedy any accidental spillages immediately.
• No open fires may be lit for cooking or any other purposes, unless in specifically designated and secured areas
• No vehicles may be washed on site, except in suitably designed and protected areas
• No vehicles may be serviced or repaired on the property, unless it is an emergency situation in which case adequate spillage containment must be implemented</td><td>prone to invasion by alien invasive plant species.</td></tr>
<tr><td colspan="3">IMPACTS ON FAUNA (Terrestrial)</td></tr>
<tr><td>Nature of the Impact: <u>Destruction of sensitive vertebrate habitat</u>

Construction will be small and temporary. This leads to certain species becoming proportionally rarer within local context. The sources of these impacts include the compaction of soil, the removal of vegetation during construction activities.

<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
</table>
</td><td>• Complete the project in as short a time frame as possible.
• Sensitive habitat should ideally be cordoned off to prevent access while construction takes place.</td><td>Impacts on sensitive areas are likely to be permanent unless no construction takes place in these areas.</td></tr>
</table>

<table>
<tr><th>Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr><td>
<table>
<tr><td>Probability</td><td>Definite (5)</td><td>Probable (3)</td></tr>
<tr><td>Duration</td><td>Long term (4)</td><td>Medium-term (3)</td></tr>
<tr><td>Extent</td><td>Regional (3)</td><td>Limited to Local Area (2)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>65 (high)</td><td>27 (low)</td></tr>
<tr><td>Status (positive, negative or neutral)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td><td></td><td></td></tr>
<tr><td>Nature of the Impact: Poaching of wildlife in the vicinity
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Definite (5)</td><td>Probable (3)</td></tr>
<tr><td>Duration</td><td>Long-term (4)</td><td>Medium-term (3)</td></tr>
<tr><td>Extent</td><td>Regional (3)</td><td>Limited to Local Area (2)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>65 (high)</td><td>27 (low)</td></tr>
<tr><td>Status (positive, negative or neutral)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td><td>• Education of construction staff about the value of wildlife and environmental sensitivity.
• Restrict access to the suitable and sensitive habitats of faunal species.
• The contractor/contractors must ensure that no animals are disturbed, trapped, hunted or killed during the construction phase. Conservation-orientated clauses should be built into contracts for construction personnel, complete with penalty clauses for non-compliance.</td><td>With education, the impact can be kept to a minimum.</td></tr>
<tr><td colspan="3">HERITAGE IMPACT</td></tr>
<tr><td>Nature of the Impact: Loss and disturbance of heritage sites due to the development.</td><td>• Known sites should be clearly marked in order that they can be avoided during construction activities.</td><td>The risk is low provided the mitigation measures are implemented</td></tr>
</table>

<table>
<tr><th>Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr><td>
• Two stone-walled Late Iron Age settlements sites. These can be classified as either Group I or Group II. Group I (dated to AD 1600 to AD 1700) settlements consists of a central kraal surrounded by a smooth outer periphery wall incorporating small stock enclosures. Group II (dated AD 1700 to 1830s) settlements seem to have developed from Group I and are characterised by more central enclosures and the outer wall includes some scallops for houses along with the typical small stock enclosures.
• The identified features are located in close proximity of the proposed development area and an unmitigated impact would be direct and have permanent consequences.
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Definite (3)</td><td>Improbable (2)</td></tr>
<tr><td>Duration</td><td>Permanent (5)</td><td>Permanent (5)</td></tr>
<tr><td>Extent</td><td>Limited to Local Area (1)</td><td>Limited to Local Area (1)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Minor (2)</td></tr>
<tr><td>Significance</td><td>Medium (36)</td><td>Low (16)</td></tr>
<tr><td>Status (positive, negative or neutral)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td><td>
• The contractors and workers should be notified that archaeological sites might be exposed during the construction activities.
• Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible;
• All discoveries shall be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken;
• Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and
• Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts,
</td><td></td></tr>
<tr><th colspan="3">VISUAL IMPACTS</th></tr>
<tr><td>
Nature of the Impact: Visual Impacts
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Improbable (2)</td></tr>
<tr><td>Duration</td><td>Short-term (2)</td><td>Short-term (2)</td></tr>
</table>
</td><td>
▪ Ensure that no litter, refuse, waste, rubbish, rubble, debris and builders wastes generated on the premises be placed, dumped or deposited on adjacent or surrounding properties including road verges, roads or public places and open spaces during or after the construction period. All waste/litter/rubbish etc. must be disposed of at an approved dumping site as approved by the Council.
▪ Bare surfaces must be rehabilitated as soon as possible with indigenous vegetation that will
</td><td>The risk is low provided the mitigation measures are implemented</td></tr>
</table>

<table>
<tr><th colspan="2">Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr><td colspan="2"><table>
<tr><td>Extent</td><td>Limited to Local Area (2)</td><td>Limited to Local Area (2)</td></tr>
<tr><td>Magnitude</td><td>Medium (6)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>30 (Medium)</td><td>20 (Low)</td></tr>
<tr><td>Status (positive, negative or neutral)</td><td>Negative</td><td>Negative</td></tr>
</table></td><td>be able to grow in the area;
▪ The landscape must be rehabilitated in such a way that it corresponds to the surrounding topography;
▪ Should overtime/night work be authorized, the Contractor shall be responsible to ensure that lighting does not cause undue disturbance to neighboring residents. In this situation low flux and frequency lighting shall be utilized.</td><td></td></tr>
<tr><td colspan="4">NOISE IMPACTS</td></tr>
<tr><td colspan="2">Noise Impacts anticipated

<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Improbable (2)</td></tr>
<tr><td>Duration</td><td>Short-term (2)</td><td>Short-term (2)</td></tr>
<tr><td>Extent</td><td>Local (2)</td><td>Local (2)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Moderate (5)</td></tr>
<tr><td>Significance</td><td>30 (Moderate)</td><td>18 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table></td><td>• Construction activities must be limited to normal working hours and according to municipal bylaws, i.e. working hours must be limited to weekdays only.
• If construction is required on the weekend; permission from adjacent landowners will be required prior to construction.
• No sound amplification equipment such as sirens, loud hailers or hooters are to be used on site except in emergencies and no amplified music is permitted on site.
• Equipment that is fitted with noise reduction facilities (e.g. side flaps, silencers etc) must be used as per operating instructions and maintained properly during site operations.</td><td>Noise pollution caused during construction could potentially be a nuisance to neighbouring residential areas. Health risk on the noise recipient if mitigation measures are not implemented.</td></tr>
<tr><td colspan="4">SOCIAL IMPACTS</td></tr>
<tr><td colspan="2">Nature of the Impact: Positive Social impacts anticipated during construction - Employment Opportunities

In terms of employment opportunities the following should be considered:
• The number of jobs that would be created during the construction and operational phase of the proposed project; and
• The extent to which certain groups such as the unemployed, disadvantaged and minority groups could be employed.
• Typical of a project of this nature, some specialised skills are</td><td>Enhancement:
• The use of local labour should be maximised where possible.
• Local people could be employed during the construction phase as Community Liaison officers.
• Eskom and the appointed contractors should promote capacity building through skills development.
• Eskom and the appointed contractors should create conditions that are conducive for the involvement of entrepreneurs, small businesses and SMME's during the construction and operational process.</td><td>Jobseekers remaining in the area, placing more pressure on existing infrastructure and services</td></tr>
</table>

<table>
<tr><th>Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr><td>required although some opportunities for local labour in the unskilled and semi-skilled categories would be available even if only of a limited nature. At this stage the extent of labour required is not finalised.

<table>
<tr><th>Description</th><th>Without Enhancement</th><th>With Enhancement</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Highly Probable (4)</td></tr>
<tr><td>Duration</td><td>Short-term (2)</td><td>Short-term (2)</td></tr>
<tr><td>Extent</td><td>Local (2)</td><td>Local (2)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>High (8)</td></tr>
<tr><td>Significance</td><td>Low (24)</td><td>48 (moderate)</td></tr>
<tr><td>Status (positive, negative or neutral)</td><td>Positive</td><td>Positive</td></tr>
</table></td><td>• Tender documentation should contain guidelines for the involvement of labour, entrepreneurs, businesses and SMME’s from the local sector.</td><td></td></tr>
<tr><td>Negative Social impacts anticipated during the construction period

• Potential disturbance of operation at the Killarney mall & the Killarney Country Club
• Safety and Security Related Impacts
• The increased dust resulting from construction activities (vegetation clearing, site preparation, earthworks, uncovered topsoil stockpiles and sand piles and loads on vehicles), vehicles, plant and machinery poses a health hazard to construction staff and people living and working in the vicinity of the site.

<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Highly Probable (4)</td><td>Probable (3)</td></tr>
<tr><td>Duration</td><td>Short-term (2)</td><td>Short-term (2)</td></tr>
<tr><td>Extent</td><td>Local (2)</td><td>Local (2)</td></tr>
</table></td><td>• All adjacent landowners (ie Killarney mall & the Killarney Country Club) must be informed of the construction processes prior to commencement of construction activities. Adjacent land owners must be informed timeously of any service stoppages in their areas.
• Notification must include possible timeframes for stoppages. Consequences of such stoppages must be clearly indicated to all surrounding/affected land owners.
• Affected land owners must be timeously informed of any/all maintenance of the bulk water services supply which may result in service stoppages to their properties. Again this must include possible timeframes so alternatives can be provided.
• All flammable substances must be stored in dry area which do not pose an ignition risk to the said substances
• Ensure all construction vehicles and machinery is under the control of competent personnel.
• No open fires will be allowed on site unless in a demarcated area identified by the ECO
• Limit access to the construction site to the workforce only. Comply with the requirements of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993).
• Construction footprints, including site offices, excavations, storage areas, materials lay-</td><td>Low risk with mitigations</td></tr>
</table>

Potential impacts:			Proposed mitigation:	Risk of the impact and mitigation not being implemented
Magnitude	High (8)	Moderate (6)	down areas, stockpile area, and workers rest areas should be clearly demarcated or fenced off before construction commences. • All construction activities should be limited to the demarcated areas. • Access to these demarcated areas strictly controlled. • Entry points and access routes to the sites must be clearly marked and traffic limited to those areas as far as possible. • Suitable warning and information signage should be erected before construction commences. • Adequate sanitary and ablutions facilities must be provided for construction workers • The facilities must be regularly serviced to reduce the risk of surface or groundwater pollution.	
Significance	**48 (moderate)**	**Low (24)**		
Status (positive or negative)	Negative	Negative		

2.2 IMPACTS THAT MAY RESULT FROM THE OPERATION PHASE

Table 5: A summary of anticipated significance of the potential direct, indirect and cumulative impacts that are likely to occur as a result of the **OPERATION PHASE** for pipe cracking and the open trench excavation methods.

<table>
<tr><th>Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr><td colspan="3">IMPACT ON WETLANDS</td></tr>
<tr><td>Nature of the Impact: Changes in water flow regime impact ratings

Activity: The replacement of sewage pipes will occur within the delineated wetland an its buffer. Any earthworks will affect water flow

<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Highly Probable (4)</td><td>Possible (2)</td></tr>
<tr><td>Duration</td><td>Medium term (3)</td><td>Short term (2)</td></tr>
<tr><td>Extent</td><td>Limited to Local Area (2)</td><td>Local (2)</td></tr>
<tr><td>Magnitude</td><td>Low (4)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>36 (Medium)</td><td>16 (Low)</td></tr>
<tr><td>Status (positive, negative or neutral)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td><td>• Implement best practice mitigation measures
• Ensure effective stormwater management
• Ensure effective rehabilitation after closure of the trench so that the topography of the watercourse is returned to its pre-development condition</td><td>Changes in the hydrology of the wetland is unlikely if adequate design and rehabilitation are implemented</td></tr>
<tr><td>Nature of the Impact: Changes in sediment entering and exiting the system.

Activity: Changing the amount of sediment entering the water resource and associated change in turbidity (increasing or decreasing the amount). Construction and maintenance activities will result in earthworks and soil disturbance as well as the disturbance of natural vegetation within the wetland channel. Activity include:
• Clearing of surface vegetation will expose the soils within, which in</td><td>• A temporary fence or demarcation must be erected around No-Go Areas outside the proposed works area prior to any construction taking place as part of the contractor planning phase when compiling work method statements to prevent access to the adjacent portions of the watercourse.
• Effective stormwater management should be a priority during the construction phase. This should be monitored as part of the EMP.
Sediment control should be effective and not allow any release of sediment pollution downstream. This should be audited on a weekly basis to demonstrate compliance with</td><td>High since reversing sediment pollution is unlikely and the impacts to the Sandspruit River are already significant.</td></tr>
</table>

<table>
<tr><th>Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr><td>rainy events would wash through the watercourse, causing sedimentation.
• Trenching in the wetland and its buffer zone.

<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Highly Probable (4)</td><td>Possible (2)</td></tr>
<tr><td>Duration</td><td>Medium term (3)</td><td>Short term (2)</td></tr>
<tr><td>Extent</td><td>Limited to Local Area (2)</td><td>Local (2)</td></tr>
<tr><td>Magnitude</td><td>Low (4)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>36 (Medium)</td><td>16 (Low)</td></tr>
<tr><td>Status (positive, negative or neutral)</td><td>Negative</td><td>Negative</td></tr>
</table></td><td>upstream conditions.</td><td></td></tr>
<tr><td>Nature of the Impact: Introduction and spread of alien vegetation.

• The moving of soil and vegetation resulting in opportunistic invasions after disturbance and the introduction of seed in building materials and on vehicles. Invasions of alien plants can impact on hydrology, by reducing the quantity of water entering a watercourse, and outcompete natural vegetation, decreasing the natural biodiversity. Once in a system alien invasive plants can spread through the catchment. If allowed to seed before control measures are implemented alien plans can easily colonise and impact on downstream users. The high density and abundance of alien plants in the watercourse increase the risk of dispersal of seeds already present in the soil.

<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
</table></td><td>• Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area and returning it where possible afterwards.
• Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance and take immediate corrective action where invasive species are observed to establish.
• Rehabilitate or revegetate disturbed areas</td><td>Expected to be Moderate due to large extent of exotic vegetation in the area.</td></tr>
</table>

<table>
<tr><th colspan="3">Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr><td colspan="3"><table>
<tr><td>Probability</td><td>Highly Probable (4)</td><td>Possible (2)</td></tr>
<tr><td>Duration</td><td>Medium term (3)</td><td>Short term (2)</td></tr>
<tr><td>Extent</td><td>Limited to Local Area (2)</td><td>Local (2)</td></tr>
<tr><td>Magnitude</td><td>Low (4)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>36 (Medium)</td><td>16 (Low)</td></tr>
<tr><td>Status (positive, negative or neutral)</td><td>Negative</td><td>Negative</td></tr>
</table></td><td></td><td></td></tr>
<tr><td colspan="3">Nature of the Impact: Loss and disturbance of wetland habitat and fringe vegetation.

• Earthworks and trenching in the delineated wetland and its buffer zone will necessarily lead to the loss of wetland habitat and fringe vegetation

<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Highly Probable (4)</td><td>Possible (2)</td></tr>
<tr><td>Duration</td><td>Medium term (3)</td><td>Short term (2)</td></tr>
<tr><td>Extent</td><td>Limited to Local Area (2)</td><td>Local (2)</td></tr>
<tr><td>Magnitude</td><td>Low (4)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>36 (Medium)</td><td>16 (Low)</td></tr>
<tr><td>Status (positive, negative or neutral)</td><td>Negative</td><td>Negative</td></tr>
</table></td><td>• Rehabilitation of disturbed wetland habitat is key to the management of environmental impacts on this project. Refer to the accompanying rehabilitation and monitoring plan for details on the steps to be implemented during rehabilitation.</td><td>Expected to be moderate provided that the mitigation measures are implemented correctly and effective control of alien species on the site is undertaken where necessary.</td></tr>
<tr><td colspan="3">Nature of the Impact: Changes in water quality due to foreign materials and increased nutrients.</td><td>• Provision of adequate sanitation facilities located outside of the watercourse or its associated buffer zone.
• Implementation of appropriate stormwater management around the excavation to prevent</td><td>Expected to be low since the pipeline should improve the current pollution status by reducing sewage input into</td></tr>
</table>

<table>
<tr><th>Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr><td>

- Construction and operational activities may result in the discharge of solvents and other industrial chemicals, leakage of fuel/oil from vehicles and the disposal of sewage resulting in the loss of sensitive biota in the wetlands/rivers and a reduction in watercourse function. During the operational phase sewage spills could occur although it is likely that the infrastructure upgrade will improve the current pollution from input of sewage into the watercourse
-

<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Possible (2)</td></tr>
<tr><td>Duration</td><td>Short-term (2)</td><td>Short-term (2)</td></tr>
<tr><td>Extent</td><td>Local (2)</td><td>Local (2)</td></tr>
<tr><td>Magnitude</td><td>Low (4)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>24 (Low)</td><td>16 (Low)</td></tr>
<tr><td>Status (positive, negative or neutral)</td><td>Negative</td><td>Negative</td></tr>
</table>

</td><td>

the ingress of run-off into the excavation and to prevent contaminated runoff into the watercourse.

- After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land shall be left in a condition as close as possible to that prior to use.
- Maintenance of construction vehicles / equipment should not take place within the watercourse or watercourse buffer.
- Control of waste discharges and do not allow dirty water from operational activities to enter the watercourse
- Treatment of pollution identified should be prioritized accordingly.

</td><td>the wetland.</td></tr>
<tr><td colspan="3">IMPACT ON VEGETATION</td></tr>
<tr><td>

Nature of the Impact: <u>Destruction of vegetation of low-medium and medium sensitivity</u>

The development will require the removal of the modified grassland within the golf course as well indigenous gardens within The Wilds. All removal of vegetation, whether sensitive or not, could have an impact on soil stabilisation and water infiltration.

The sources of this impact could include:

- Clearing of and damage to vegetation in construction footprint, access roads, construction camps, vehicle / machinery traffic and trampling by workers;
- Illegal disposal and dumping of construction material such as

</td><td>

- Rehabilitate construction camps and any other grassland vegetation that was impacted on by the construction. Use grass sods that were removed prior to construction to rehabilitate the construction footprints. Sods must not be stored for lengthy periods and should not be stacked on top of each other or on top of grazed and moist grasslands. The sods should preferably be removed during the winter months and replanted by springtime latest.
- Rehabilitation will be successful when the current status quo of mowed grassland and planted indigenous trees are attained.
- Only indigenous plant species may be used for rehabilitation.
- Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular or pedestrian access.
- Ensure that maintenance work does not take place haphazardly, but according to a fixed plan.
- Maintenance workers may not trample natural vegetation and work should be restricted to previously disturbed footprint. In addition, mitigation measures as set out for the

</td><td>

Localised alteration of soil surface characteristics and loss of flora.

- Edge effects into The Wilds Park

</td></tr>
</table>

<table>
<tr><th>Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr><td>cement or oil, as well as maintenance materials during construction.
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Improbable (2)</td></tr>
<tr><td>Duration</td><td>Short term (5)</td><td>Very short (1)</td></tr>
<tr><td>Extent</td><td>Local area (2)</td><td>Limited to Site (1)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>39 (medium)</td><td>12 (low)</td></tr>
<tr><td>Status (positive, negative or neutral)</td><td>Negative</td><td>Negative</td></tr>
</table></td><td>construction phase should be adhered to.
• Address erosion donga crossings, applying soil erosion control and bank stabilisation procedures as specified by the ECO.</td><td></td></tr>
<tr><td>Nature of the Impact: <u>Destruction of vegetation within The Wilds and rocky outcrop</u>

Plant species of conservation concern and protected plants occur within The Wilds. The proposed pipeline route and 20m buffer is unlikely to be habitat to these species due to its occurrence along boundary fences and historical impacts. However, the remainder of The Wilds are habitat to plant species of conservation concern and should not be impacted on.
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Improbable (2)</td></tr>
<tr><td>Duration</td><td>Short term (2)</td><td>Very short term (1)</td></tr>
<tr><td>Extent</td><td>Limited to Site (2)</td><td>Limited to the Site (1)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>30 (medium)</td><td>12(low)</td></tr>
<tr><td>Status (positive,</td><td>Negative</td><td>Negative</td></tr>
</table></td><td>• Rehabilitation of the vegetation within The Wilds must be done in accordance with the guidelines set by City Parks and the relevant horticulturist and must be discussed prior to commencement of activities.
• Monitoring must ensure that no alien invasive plant species colonise the disturbance footprint.</td><td>failed rehabilitation and invasion of the disturbance footprint by alien invasive plant species</td></tr>
</table>

<table>
<tr><th>Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr><td>
<table>
<tr><td>negative or neutral)</td><td></td><td></td></tr>
</table>
</td><td></td><td></td></tr>
<tr><td>
Nature of the Impact: Potential increase in invasive vegetation

The seed of alien invasive plant species that occur on and in the vicinity of the construction areas could spread into the disturbed and stockpiled soil. Also, the construction vehicles and equipment were likely used on various other sites and could introduce alien invasive plant seeds or indigenous plants not belonging to this vegetation unit to the construction site. this is of particular concern at The Wilds.

<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Improbable (2)</td></tr>
<tr><td>Duration</td><td>Long term (4)</td><td>Short term (2)</td></tr>
<tr><td>Extent</td><td>Limited to Local Area (2)</td><td>Limited to the Site (1)</td></tr>
<tr><td>Magnitude</td><td>Low (4)</td><td>Minor (2)</td></tr>
<tr><td>Significance</td><td>30 (medium)</td><td>10 (low)</td></tr>
<tr><td>Status (positive, negative or neutral)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td><td>
• •Only use indigenous species, naturally occurring in the area, to rehabilitate the disturbance footprint.
• •Monitor and control the rehabilitated areas remove alien invasive species as soon as they become apparent.
</td><td>Re-infestation in areas initially cleared.</td></tr>
<tr><td>
Nature of the Impact: Clearing of land for construction camps and potential pollution of the soil and water

These may be at one or several locations, area will be cleared and levelled where necessary, site offices may be temporary structures, machinery, building supplies and temporary staff facilities (excluding accommodation) will be housed here. The impacts could include:
</td><td>
• Monitor all sites disturbed by construction activities for colonisation by exotics or invasive plants and control these as they emerge. Monitoring should continue for at least two years after construction is complete.
</td><td>Compaction on construction camps could result in altered topsoil characteristics and vegetation composition. These areas are also prone to invasion by alien invasive plant species.</td></tr>
</table>

<table>
<tr><th>Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr><td>
• Removal of vegetation
• Levelling and compaction of soils
• Storage of machinery, supplies and staff facilities
This could lead to the loss of vegetation and/or species of conservation concern, alteration and loss of microhabitats, altered vegetation cover, increased erosion and contamination of soil and groundwater.
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Improbable (2)</td></tr>
<tr><td>Duration</td><td>Long term (4)</td><td>Very short-term (1)</td></tr>
<tr><td>Extent</td><td>Limited to Local Area (2)</td><td>Site bound (1)</td></tr>
<tr><td>Magnitude</td><td>Low (4)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>30 (medium)</td><td>12 (low)</td></tr>
<tr><td>Status (positive, negative or neutral)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td><td></td><td></td></tr>
<tr><td colspan="3">IMPACTS ON FAUNA</td></tr>
<tr><td>
Nature of the Impact: <u>Destruction of sensitive vertebrate habitat</u>

Construction will be small and temporary. This leads to certain species temporarily becoming proportionally rarer and as such within local context
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Definite (5)</td><td>Probable (3)</td></tr>
<tr><td>Duration</td><td>Medium-term (3)</td><td>Medium-term (3)</td></tr>
<tr><td>Extent</td><td>Regional (3)</td><td>Limited to Local Area (2)</td></tr>
</table>
</td><td>
• Complete the project in as short a time frame as possible.
• Sensitive habitat should ideally be cordoned off to prevent access while construction takes place.
</td><td>Impacts on sensitive areas are likely to be permanent unless no construction takes place in these areas.</td></tr>
</table>

<table>
<tr><th>Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr><td>
<table>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>60 (high)</td><td>27 (low)</td></tr>
<tr><td>Status (positive, negative or neutral)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td><td></td><td></td></tr>
<tr><td>Nature of the Impact: Poaching of wildlife in the vicinity
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Definite (5)</td><td>Probable (3)</td></tr>
<tr><td>Duration</td><td>Medium-term (3)</td><td>Medium-term (3)</td></tr>
<tr><td>Extent</td><td>Regional (3)</td><td>Limited to Local Area (2)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>60 (high)</td><td>27 (low)</td></tr>
<tr><td>Status (positive, negative or neutral)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td><td>• Education of construction staff about the value of wildlife and environmental sensitivity.
• Restrict access to the suitable and sensitive habitats of faunal species.
• The contractor/contractors must ensure that no animals are disturbed, trapped, hunted or killed during the construction phase. Conservation-orientated clauses should be built into contracts for construction personnel, complete with penalty clauses for non-compliance.</td><td>With education, the impact can be kept to a minimum.</td></tr>
<tr><td colspan="3">HERITAGE IMPACT</td></tr>
<tr><td>Nature of the Impact: Loss and disturbance of heritage sites due to the development.

The identified features are located in close proximity of the proposed development area and an unmitigated impact would be direct and have permanent consequences.
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Low (1)</td><td>Low (1)</td></tr>
</table>
</td><td>• A person or entity, e.g. the Environmental Control Officer, should be tasked to take responsibility for the heritage sites and should be held accountable for any damage.
• Known sites should be located and isolated, e.g. by fencing them off. All construction workers should be informed that these are no-go areas, unless accompanied by the individual or persons representing the Environmental Control Officer as identified above.
• In areas where the vegetation is threatening the heritage sites, e.g. growing trees pushing walls over, it should be removed, but only after permission for the methods proposed has been granted by SAHRA. A heritage official should be part of the team executing these measures.</td><td>None, if impacts during the construction phase are properly managed,</td></tr>
</table>

<table>
<tr><th>Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr><td>
<table>
<tr><td>Duration</td><td>Permanent (5)</td><td>Permanent (5)</td></tr>
<tr><td>Extent</td><td>Limited to Local Area (1)</td><td>Limited to Local Area (1)</td></tr>
<tr><td>Magnitude</td><td>Minor (8)</td><td>Minor (8)</td></tr>
<tr><td>Significance</td><td>Low (8)</td><td>Low (8)</td></tr>
<tr><td>Status (positive, negative or neutral)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td><td></td><td></td></tr>
<tr><td colspan="3">VISUAL IMPACTS</td></tr>
<tr><td>Nature of the Impact: Visual Impacts
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Improbable (2)</td></tr>
<tr><td>Duration</td><td>Short-term (2)</td><td>Short-term (2)</td></tr>
<tr><td>Extent</td><td>Limited to Local Area (2)</td><td>Limited to Local Area (2)</td></tr>
<tr><td>Magnitude</td><td>Medium (6)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>30 (Medium)</td><td>20 (Low)</td></tr>
<tr><td>Status (positive, negative or neutral)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td><td>• Ensure that no litter, refuse, waste, rubbish, rubble, debris and builders wastes generated on the premises be placed, dumped or deposited on adjacent or surrounding properties including road verges, roads or public places and open spaces during or after the construction period. All waste/litter/rubbish etc. must be disposed of at an approved dumping site as approved by the Council.
• Bare surfaces must be rehabilitated as soon as possible with indigenous vegetation that will be able to grow in the area;
• The landscape must be rehabilitated in such a way that it corresponds to the surrounding topography;
• Should overtime/night work be authorized, the Contractor shall be responsible to ensure that lighting does not cause undue disturbance to neighboring residents. In this situation low flux and frequency lighting shall be utilized.</td><td>The risk is low provided the mitigation measures are implemented</td></tr>
<tr><td colspan="3">SOCIAL IMPACTS</td></tr>
<tr><td>Nature of the Impact: Improved Service delivery (Positive)
• Implementation of this project will help in improving the hydraulic</td><td>None required</td><td>none</td></tr>
</table>

<table>
<tr><th>Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr><td>capacity of the sewer lines, in so doing the sewer pipeline will have sufficient capacity for future growth.

• This will also result in financial savings for Johannesburg Water as pipe repairs and sewer overflows will be reduced.

<table>
<tr><th>Description</th><th>Without Enhancement</th><th>With Enhancement</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Probable (3)</td></tr>
<tr><td>Duration</td><td>Short-term (2)</td><td>Short-term (2)</td></tr>
<tr><td>Extent</td><td>Limited to Local Area (2)</td><td>Limited to Local Area (2)</td></tr>
<tr><td>Magnitude</td><td>Medium (6)</td><td>Medium (6)</td></tr>
<tr><td>Significance</td><td>30 (Medium)</td><td>30 (Medium)</td></tr>
<tr><td>Status (positive, negative or neutral)</td><td>Positive</td><td>Positive</td></tr>
</table>
</td><td></td><td></td></tr>
</table>

2.3 NO GO OPTION

This is the option of not replacing the sewer pipes within the Houghton Estate, this option will result in no impacts occurring on the biophysical environment (i.e. biodiversity, soils), and will result in no visual or social impact hence the project site status quo remains. This alternative implies that the Joburg Water Operations Department cannot implement maintenance on the pipe as it is across the river, which raises safety concerns for depot laborers. Implementation of this project will help in improving hydraulic capacity of the waterline and reduce the recurring burst pipes in Houghton Estate, in so doing the water pipe line will have sufficient capacity for future demand. This will also result in financial savings for Johannesburg Water as pipe repairs and unaccounted for water will be reduced. This alternative implies that the City will not be able to attain this goal and therefore **the no go option is not preferred.**

Table 6: Potential impacts should the development not be Approved **"No-Go" Alternative**

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**
Impact on wetland	Low	There are no mitigation measures	Negligible	**No risk**
Impact on vegetation	Low	There are no mitigation measures	Negligible	No risk
Sedimentation	Negligible	There are no mitigation measures	Negligible	No risk
Establishment of alien plants	**N – Very High**	There are no mitigation measures	**N – Low**	**Very Low risk**
Loss of wetland habitat	Negligible	There are no mitigation measures	Negligible	No risk
Pollution of watercourses	Negligible	There are no mitigation measures	Negligible	No risk
Visual Impacts	Negligible	There are no mitigation measures	Negligible	No risk
Noise Impacts anticipated	Negligible	There are no mitigation measure	Negligible	
Loss and disturbance of heritage sites due to the development.	Negligible	There are no mitigation measures	Negligible	No risk
Social impacts anticipated during the construction period (Positive)	**N – Very High**	There are no mitigation measures	Negligible	No risk

Social impacts anticipated during the construction period (Negative)	Negligible	There are no mitigation measures	Negligible	No risk

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

- Ecology Assessment (Fauna & Flora)
- Wetland Assessment
- Heritage Assessment

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

- The information provided by the client forms the basis of the planning and layouts discussed.
- All wetlands within 500 m of any developmental activities should be identified as per the DWS Water Use Licence application regulations. Wetlands within the study sites were delineated on a fine scale based on detailed soil and vegetation sampling. Wetlands that fall outside of the site, but that fall within 500 m of the proposed activities were delineated based on desktop analysis of vegetation gradients visible from aerial imagery.
- The detailed field study was conducted from a once off field trip and thus would not depict any seasonal variation in the wetland plant species composition and richness.
- Description of the depth of the regional water table and geohydrological and hydropedological processes falls outside the scope of the current assessment
- Floodline calculations fall outside the scope of the current assessment
- A Red Data scan, fauna and flora, and aquatic assessments were not included in the current study
- Some watercourse areas are located in gated communities, housing complexes, fenced areas and other inaccessible areas.
- The recreation grade GPS used for wetland and riparian delineations is accurate to within five meters.

3. IMPACTS THAT MAY RESULT FROM THE DECOMISSIONING 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.

Proposed and Alternative Designs

Potential impacts:	**Significance rating of impacts(positive, negative or neutral):**	**Proposed mitigation:**	**Significance rating of impacts after mitigation:**	**Risk of the impact** and **mitigation not being implemented**
Considering the strategic importance of this infrastructure, it is unlikely that it will be decommissioned in the foreseeable future. The infrastructure may however require maintenance and repairs during the life of its operation, whereby the similar impacts might be experienced as during construction phase of the project. Should the				

infrastructure need maintenance or repairs, the mitigation and management measures provided for during the construction phase will be implemented.

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

Specialist studies for decommissioning and closure phase will be undertaken at the time when decommissioning is contemplated by the developer.

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

Ongoing post decommissioning management cost will not be determined at this stage as this phase of the development is not yet contemplated.

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 can result from an effect which in itself may not be significant but may become significant if added to other existing or potential impacts that may result from activities associated with the proposed development. The anticipated cumulative impacts of this development includes the following:

Impacts on the Wetland

- Some changes in the hydrology of the wetlands could occur due to ineffective stormwater management and rehabilitation. This could impact negatively on the downstream Sandspruit River
- Changes in sediment entering and exiting the system are expected to be **high**. Should mitigation measure not be implemented and sediment from upslope activities is washed into the watercourse and downstream Sandspruit River, changes to the hydrology of the stream, including meandering, increased potential for flooding and movement of bed material may occur.
- Changes in water quality is expected to be **high** since possible sewage spills would add to the cumulative effect of current pollution in the Sandspruit River wetland

Impacts on the Vegetation

- A number of invasive species are present within the area that the proposed development is situated in Therefore, if mitigation measures to limit and prevent the spread of alien species are not implemented; the cumulative impact could lead to the parks or disturbed areas transformed by alien plant species.

Destruction of sensitive vertebrate habitat

- Construction and operational activities will result in cumulative impact to the sensitive vertebrate habitat on the study site and even beyond. It is imperative that effective protective measures should be put into place and monitored in sensitive areas.
- Certain species becoming proportionally rarer or even becoming locally extinct.

- A rehabilitation plan should be put into action should any sensitive areas suffer degradation.

Destruction Heritage resources

- Loss of one of a limited number of similar features in the larger landscape.

Increased socio-economic up-liftment as a result of the proposed development (Positive Impact)

- Constructing the proposed development will result in additional jobs being created in the area and skills development during the construction phase. Due to the high unemployment rate in the study area. The positive impact will be very low positive but with enhancement it can be low positive.

*Generally, the **cumulative impact** is rated as **Low** fort the larger part of the project as it falls within developed areas, however the cumulative impacts on the wetland area could be **medium significance** as changes made to the bed or banks of watercourse and unstable channel conditions may result causing erosion, meandering, increased potential for flooding and movement of bed material, which will result in property damage adjacent to and downstream of the site. Reversing this process is unlikely and should be prevented in the first place.* **If mitigation measures are adequately implemented, low to no cumulative impacts are expected.**

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.

The following **conclusions were drawn from the specialist studies** undertaken within this Basic Assessment:

Wetland Assessment:

The proposed replacement of sewage pipeline infrastructure in Houghton will potentially affect a section of the Sandspruit along the M1. A small artificial wetland was recorded in The Wilds Park. This wetland lies approximately 750m south of the headwaters of the Sandspruit and is separated from the watercourse by the M11 and an intersection with Houghton Drive. Current site conditions reflect a landscaped wetland with no natural features. This wetland is therefore not assessed in this report. However, the Sandspruit has been canalised in underground pipes in this part of Johannesburg and a possibility remains that this wetland could be connected, or may have been connected, to the Sandspruit in the past. The proposed methods for pipe replacement include pipe cracking and the open trench excavation. *Since the pipeline lies within the delineated watercourse and its associated buffer zone, and traverses across the stream channel, extensive earthworks will impact on this wetland*

Vegetation Assessment

The vegetation along the route comprised mainly of modified vegetation and ranged from low- medium to medium sensitivity to the pipeline replacement. The vegetation within the Killarney Golf Course and along the

channelled Sandspruit are not in a natural state and are not representative of the Egoli Granite Grassland that historically occurred in this area of Johannesburg. Other than some indigenous tree and grass species, the species composition has been compromised. However, the grassland function as open space, ground water recharges zones and soil stabilisation remains. These functions can be preserved as the modified grassland can be rehabilitated to the current status quo.

The Wilds Park includes natural vegetation representative of the Gold Reef Mountain Bushveld. In addition, it is the only remaining open space on a Class 4 ridge, falls within a CBA and is suitable habitat to a number of plant species of conservation concern. The Wilds is considered of high sensitivity, however, the portion mapped within the 20m buffer is situated along the boundary fence were historic impacts and disturbances took place. The area likely to be impacted on along the western section of Houghton drive comprise indigenous gardens and it is unlikely that the eastern portion of The Wilds (east of Houghton Drive) will be impacted. In fact, it should be avoided. The rocky outcrop just south of The Wilds is the only other remnant natural open space along the route. The rocky area includes a number of invasive plant species and included planted species not originally part of the Gold Reef Mountain Bushveld. The outcrop is situated east of Houghton Drive and unlikely to be directly impacted on.

From a vegetation perspective, the proposed pipeline replacement will have limited impact on vegetation and can be mitigated. However, impacts within The Wilds must be limited and the accidental introduction of invasive species to the area avoided.

Fauna assessment:

The replacement of the pipes will have a modest and temporary effect on vertebrates. Additionally we point out that the affected area has been compromised for almost a century; thus we are evaluating an impact on an already impacted area. Terrestrial vertebrates has been excluded from genetic interchanges (i.e. gene flow) for decades, whereas flighted vertebrates will (in our opinion) not be affected at all. *Hence we argue that the planned construction will be brief and will, furthermore, have virtually no environmental impact in an area which is decidedly not a conservations asset. Clearly the development will have virtually no conservation impact.*

Heritage assessment:

Impact analysis of cultural heritage resources under threat of the proposed development, is based on the present understanding of the development:

- Although the region is known for its large number of old houses, some of which are declared provincial heritage sites, as well as sites of natural heritage significance (The Wilds), these would not be impacted on by the proposed development, as all the activities would take place in the road reserves.
- As no sites, features or objects of cultural significance are known to exist in the development area, there would be no impact as a result of the proposed development..

From a heritage point of view, it is recommended that the proposed development be allowed to continue on acceptance of that "*should archaeological sites or graves be exposed in other areas during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made*".

Overall Conclusion:

As this project is for the installation of a buried pipeline largely within road reserve, impacts associated with the area are generally potentially of low significance. However, in certain areas, modifications to riparian vegetation and river banks are likely to occur during construction. The project will entail the clearing of moderate amounts of vegetation and levelling of areas for the construction activities. This has the potential to increase erosion and sedimentation of downstream habitats due to surface runoff during the wet season. Due to the proximity of the construction to the water resources, direct impacts to the water resources are likely. Although the environmental impact may be of high significance in some cases as discussed above, it will be of a limited duration. Once the construction has been completed the \ impact is considered to be of low risk with proper mitigations put in place to reduce impacts to local and downstream water resources. Furthermore, from a social perspective, some disturbance may be experienced to certain activities in the area i.e. the Killarney Mall, Killarney Country Club, schools in the area etch…

It is the opinion of the EAP together with the specialists' conclusion that no fatal flaws have been identified for the Houghton Estate Sewer Pipe Replacement Project, and that the project should proceed with adequate mitigation measures implemented to reduce impacts to local and downstream water resources.

Alternative 1

See above, the impacts of alternatives are similar and therefore are not comparatively assessed.

No-go (compulsory)

This is the option of not replacing the sewer pipes within the Houghton Estate, this option will result in no impacts occurring on the biophysical environment (i.e. biodiversity, soils), and will result in no visual or social impact hence the project site status quo remains. This alternative implies that the Joburg Water Operations Department cannot implement maintenance on the pipe as it is across the river, which raises safety concerns for depot laborers. Implementation of this project will help in improving hydraulic capacity of the waterline and reduce the recurring burst pipes in Houghton Estate, in so doing the water pipe line will have sufficient capacity for future demand. This will also result in financial savings for Johannesburg Water as pipe repairs and unaccounted for water will be reduced. This alternative implies that the City will not be able to attain this goal and therefore **the no go option is not preferred.**

6. IMPACT SUMMARY OF THE PROPOSAL AND ALTERNATIVE

A summary of the impact assessments is presented in **Table 7 and 8;** the tables cover the construction and operational impacts. An overall weighted score is provided in each case. Thus far each of the environmental issues are assigned equal weighting (I.e. the weighted score is the average of each of the individual scores. The impact scores are also colour coded according to the following:

< 30	**Low significance**
30 to 60	**Moderate significance**
>60	**High significance**

It must be noted that the impact scores in **Table 7 & 8** below are not intended to be definitive measures of environmental impact, but they are a useful guide to evaluating the overall environmental performance of a new development and they assist in interpreting key influences of a development

Table 7: Impact Summary table **: CONSTRUCTION PHASE**

Environmental Aspect	Without Mitigation	With Mitigation
IMPACT ON WATERCOURSES		
Changing the quantity and fluctuation properties of the watercourse by for example restricting water flow or increasing flood flows.	High	Medium
Changes in sediment entering and exiting the system	High	Medium
Introduction and spread of alien vegetation.	High	Medium
Loss and disturbance of wetland habitat and fringe vegetation.	High	Medium
Changes in water quality due to foreign materials and increased nutrients.	Medium	Low
IMPACT ON VEGETATION		
Destruction of vegetation of low-medium and medium sensitivity	Medium	Low
Destruction of vegetation within The Wilds and rocky outcrop	Medium	Low
Potential increase in invasive vegetation	Medium	Low
Clearing of land for construction camps and potential pollution of the soil and water	Medium	Low
IMPACTS ON FAUNA (Terrestrial)		
Destruction of sensitive vertebrate habitat	High	Low
Poaching of wildlife in the vicinity	High	Low
HERITAGE IMPACT		
Loss and disturbance of heritage sites due to the development.	Low	Low
VISUAL IMPACT		
Visual Impacts	Medium	Low
NOISE IMPACT		
Noise Impacts anticipated	Medium	Low
SOCIAL IMPACT		
Positive Social impacts	Low	Medium
Negative Social impacts	Medium	Low

Table 8: Impact Summary table **: OPERATIONAL PHASE**

Environmental Aspect	Without Mitigation	With Mitigation
IMPACT ON WATERCOURSES		
Changing the quantity and fluctuation properties of the watercourse by for example restricting water flow or increasing flood flows.	Medium	Low
Changes in sediment entering and exiting the system	Medium	Low
Introduction and spread of alien vegetation.	Medium	Low
Loss and disturbance of wetland habitat and fringe vegetation.	Medium	Low
Changes in water quality due to foreign materials and increased nutrients.	Low	Low
IMPACT ON VEGETATION		
Destruction of vegetation of low-medium and medium sensitivity	Medium	Low
Destruction of vegetation within The Wilds and rocky outcrop	Medium	Low
Potential increase in invasive vegetation	Medium	Low
Clearing of land for construction camps and potential pollution of the soil and water	Medium	Low
IMPACTS ON FAUNA (Terrestrial)		
Destruction of sensitive vertebrate habitat	High	Low
Poaching of wildlife in the vicinity	High	Low
HERITAGE IMPACT		
Loss and disturbance of heritage sites due to the development.	Low	Low
VISUAL IMPACT		
Visual Impacts	Medium	Low
NOISE IMPACT		
Noise Impacts anticipated	Medium	Low
SOCIAL IMPACT		
Positive Social impacts	Medium	Medium

For alternative:

Please refer to **Table 7 & 8**

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.

Houghton experiences several sewer blockages and sewer overflows, this can be attributed to the ageing of the infrastructure and intrusion of foreign objects (root intrusion) in the sewer system. The main objectives of the project are to improve service delivery to customers, reduce maintenance on the sewer system and reduce operating costs, thus this renders this alternative non-viable.

The assessment described an approach whereby trenchless methods such as directional drilling will be used to install pipes crossing surfaced roads and where this is not feasible, open trenching will be used have been assessed as an alternative.

Having assessed the impacts of both technology methods to be employed for the river crossings, in both cases, the recorded impacts before mitigation were High-Medium and without mitigation, impacts can be reduced to Medium-Low with recommended mitigation measures. The **identified impacts** particularly **on the wetlands** were slightly higher for the open trenching methods during construction/operation phase of the development as opposed to the trenchless methods. Therefore from an environmental perspective, the trenchless method is recommended for implementation for the river crossings.

Cognisant of the above-mentioned conclusions established through the basic assessment investigation, there were areas of environmental sensitivity identified along the recommended route. These include areas such as sensitive vegetation (i.e. protected plants) & watercourses, these are shown in the environmental sensitivity map (refer to Appendix A). The significance levels of the majority of identified negative impacts for all alternatives investigated can generally be reduced to acceptable levels thus, the proposed developments could proceed provided that the mitigation measures set out in this report and in the EMPr and the Rehabilitation Plan (Appendix H) are diligently implemented to limit the potential impacts on vegetation, watercourses and social during construction and operation of the developments.

7. SPATIAL DEVELOPMENT TOOLS

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

Provincial Spatial Development Framework (PSDF)
The Gauteng PSDF is a provincial and strategic planning policy that responds to and complies with in particular the National Development Plan vision 2030 and the National Spatial Development Perspective (NSDP). This framework promotes a developmental state in accordance to the principals of global sustainability as is stated by among others, the South African constitution and enabling legislation. The Gauteng PSDF is based on six growth and development pillars, each of which has its onset of drivers with long term-programmes. Pillar 1 highlights the job creation. The proposed development will create jobs opportunities during the construction phase, these employment opportunities will target local community members that are usually excluded from mainstream economic and formal employment. Therefore, the development is in line with the Gauteng PSDF.
Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).
The study area falls within the City of Johannesburg Metropolitan Municipality **Region E & F**. According to the CoJ IDP 2018/19 *The city's total infrastructure backlog stands at R170 billion composed of collapsing bridges, city pavements that are in a poor condition, potholes, burst water pipes and ailing substations. Finding effective solutions to these basic infrastructural problems is crucial, particularly if the City is show increased economic growth and cater to the needs of its poorest and most vulnerable citizens. Despite a requirement to renew approximately 2% of the*

water network per year, the City has historically renewed only about 0.2% thereof. This decay is reflected in available data from 2016/17 which shows that the water network suffered 45 000 burst for the year have reached 31% and there are currently 371 leaks per kilometre of water pipes. This is despite the fact we know that water will be one of the greatest challenges in our future".

The proposed development will therefore not compromise the IDP objectives but would rather assist the Local Municipality in achieving the performance areas as identified by the Local Municipality, namely growth in the region and creation of more employment opportunities as well as through the improvement of public services and broadening access to communities and thereby improving quality of living which is further aligned with achieving the goal of opportunity in terms of economic growth and employment which also entails access to basic services, social infrastructure and quality environment. Furthermore the Municipality aims to achieve inclusivity which aims to integrate communities and improve transport corridors and human settlements. One such priority for the Municipality is the improvement of mobility corridors with specific reference to proposed development (road infrastructure). The Municipality seeks to address past spatial planning imbalances by bringing services and economic opportunities close to previously disadvantaged areas.

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**

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:

This Draft BAR has provided a comprehensive assessment of the potential environmental impacts associated with the Houghton Estate Sewer Pipe Replacement Project. It is the opinion of the EAP and various specialists that there are no environmental or social impacts of high significance that would prevent the establishment of the proposed project, It is recommended that the project **should be authorised for implementation** as this will help in the blockages experienced in the area and help with future demand which might occur. The authorisation must be subjected to the following conditions:

- A final detailed layout must be submitted to the relevant authority for approval prior to commencement with the project;
- The Environmental Management Programme (EMPr) as contained within Appendix H of this report should form part of the contract with the Contractors appointed to construct and maintain the proposed power line, and will be used to ensure compliance with environmental specifications and management measures. The implementation of this EMPr for all life cycle phases of the project is considered to be key in achieving the appropriate environmental management standards as detailed for this project.
- An independent Environmental Control Officer (ECO) should be appointed to monitor compliance with the specifications of the EMPr for the duration of the construction period.
- Implementation of the Wetland Rehabilitation Plan

- An appropriate stormwater management plan must be developed and implemented to the site. Adequate measures must be put in place to prevent polluted runoff water from entering the, wetland and soil, thus preventing surface and groundwater pollution;
- The relevant authorisations and water use licenses must be obtained from Department of Water Affairs prior to the commencement of construction activities. No activities may proceed within or in proximity to watercourses without a Water Use License permitting the activity.
- Should heritage features, archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.
- All relevant legislation and requirement of other government departments (National, Provincial), in particular of Section 28 (duty of care) of NEMA, must be complied with
- In the event of a major incident (e.g. fire causing damage to property and environment, major spill or leak of contaminants), the relevant authorities should be notified as per the notification of emergencies/ incidents, as per the requirements of NEMA.
- Compliance with all legal requirements in relation to environmental management and conditions of the authorisation issued by GDARD.

9. THE NEEDS AND DESIREBILITY OF THE PROPOSED DEVELOPMENT *(as per notice 792 of 2012, or the updated version of this guideline)*

A project charter, was compiled by the Johannesburg Water Infrastructure Planning Section requesting for the replacement of existing sewer pipes within identified streets in the Houghton area. Numerous blockages have been experienced in the area. The project was assigned to the Design Section to investigate, carry out designs and implement. The sewers from the affected streets in the network were prioritized for replacement within the 2017/2018 financial year as emergency projects.

It was discovered that all the sewer lines in Houghton are 70 years old; the pipes were laid in the year 1948. It was decided that the pipes should be upgraded due to numerous blockages, sewer overflows and pipe collapse in the area. The project is currently under investigations and CCTV inspection will be conducted in order to obtain information about the structural integrity of the pipe. The main objective of this project is to replace the existing Vitrified Clay and concrete pipes in Houghton. It was determined by infrastructure planning of Johannesburg water that the pipes have to be prioritised as emergency projects and there the pipe needed to be upgraded and refurbished..

The implementation of this project will help in improving the hydraulic capacity of the sewer lines, in so doing the sewer pipeline will have sufficient capacity for future growth. This will also result in financial savings for Johannesburg Water as pipe repairs and sewer overflows will be reduced.

10. THE PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED (Consider when the activity is expected to be concluded)

Duration and Validity: The environmental authorization is required for a period of 10 years from the date of issue. Should a longer period be required, the applicant/EAP will be required to provide a detailed motivation on what the period of validity should be

11. THE PERIOD 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**

SECTION F: APPENDICES

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 A: Site plan(s)
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
Appendix I: Other information

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.