

**DRAFT**

**ENVIRONMENTAL MANAGEMENT  
PROGRAMME FOR THE PROPOSED  
CONSTRUCTION OF THE HALFWAY HOUSE  
BULK WATER PIPELINE WITHIN THE  
JURISDICTION OF THE CITY OF  
JOHANNESBURG METROPOLITAN  
MUNICIPALITY IN THE GAUTENG PROVINCE**

**GDARD REF:**

**GAUT 001/22-23/0665**

**DATE**

**JUNE 2023**

**PREPARED FOR**



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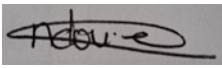
"From the world we live to the world we seek "

**DOCUMENT CONTROL**


**PROJECT TITLE:**

**ENVIRONMENTAL MANAGEMENT PROGRAMME FOR THE PROPOSED CONSTRUCTION OF THE HALFWAY HOUSE BULK WATER PIPELINE WITHIN THE JURISDICTION OF THE CITY OF JOHANNESBURG METROPOLITAN MUNICIPALITY IN THE GAUTENG PROVINCE**

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<b>ACRONYMS</b>	
BAR	Basic Assessment Report
CARA	Conservation of Agricultural Resources Act (Act 43 of 1983)
CEO	Contractor Environmental Officer
DEA	Department of Environmental Affairs
EAP	Environmental Assessment Practitioner
EA	Environmental Authorisation
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment

EMPR	Environmental Management Programme
GDARD	Gauteng Department of Agriculture and Rural Development
HIA	Heritage Impact Assessment
NEMA	National Environmental Management Act (Act 107 of 1998)
NEMWA	National Environmental Management Waste Act (Act 36 of 2008)
NEMAQA	National Environmental Air Quality Act (Act 39 of 2004)
NEMBA	National Environmental Management Biodiversity Act (Act 10 of 2004)
NHRA	National Heritage Resources Act (Act 25 of 1999)
NWA	National Water Act (Act 36 of 1998)
OHSA	Occupational Health and Safety Act (Act of 85 of 1993)
SACNASP	South African Council of Natural Scientists Profession
SAHRA	South African Heritage Resources Agency
WULA	Water Use Licence Application

## 1. INTRODUCTION

Nsovo Environmental Consulting (hereafter referred to as Nsovo) has been appointed by Johannesburg Water (SOC) Ltd (hereafter referred to as Joburg Water) to compile a Basic Assessment Report (BAR) in terms of National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) and this Environmental Management Programme (EMPr) is compiled in response to the impacts identified in the BAR for the proposed development of the Halfway House Bulk Water Pipeline.

The proposed development is located in Halfway House, Midrand within Ward 2 of the City of Johannesburg Metropolitan Municipality in Gauteng Province.

### 1.1. PURPOSE AND SCOPE OF THE EMPr

An Environmental Management Programme (EMPr) is an environmental management tool used to ensure that undue or reasonable avoidable adverse impacts of the construction, operation, and decommissioning of a project are prevented or mitigated and that the positive benefits of the project are enhanced. This EMPr serves as a guideline for the site's management and provides specifications and regulations that must be adhered to in all instances. It is the responsibility of all parties, including Contractors and Sub-Contractors, involved in the daily activities to commit to implementing the EMPr throughout the project.

This EMPr is prepared to provide specific environmental measures to be implemented during the life span of the Halfway House pipeline. As such, all activities to be undertaken during the project's planning, construction, operation and decommissioning phases have been considered.

Furthermore, this document gives effect to preventive measures, which are to be put in place for the monitoring of the activities that will take place on-site and ensure compliance with the national legislative and regulatory requirements, as well as Joburg Water monitoring guidelines and implementation tools associated with their operation.

The objectives of the EMPr are to:

- Ensure that the activity is undertaken in compliance with national and provincial environmental legislations as well as local by-laws and policies.
- Detail mitigation measures, timeframes, and criteria for assessing the success or failure of each measure.
- Provide detailed monitoring programs to ensure compliance.
- Provide input and strategies for environmental quality control and risk management.
- To preserve the natural environment by limiting destructive actions on-site.
- Ensure appropriate restoration of areas affected by the proposed activities.



- Prevent long term environmental degradation; and
- Ensure that activities consider the rights of other land users to enjoy a safe and healthy living environment.

## **1.2. LOCALITY OF THE PROPOSED PROJECT**

The proposed development traverses various farm in Midrand, within the jurisdiction of City of Johannesburg (CoJ) Metropolitan Municipality in the Gauteng Province. Figure 1 below shows a locality map that depicts the proposed study area at a scale of 1:50 000. (Map attached as Appendix B).

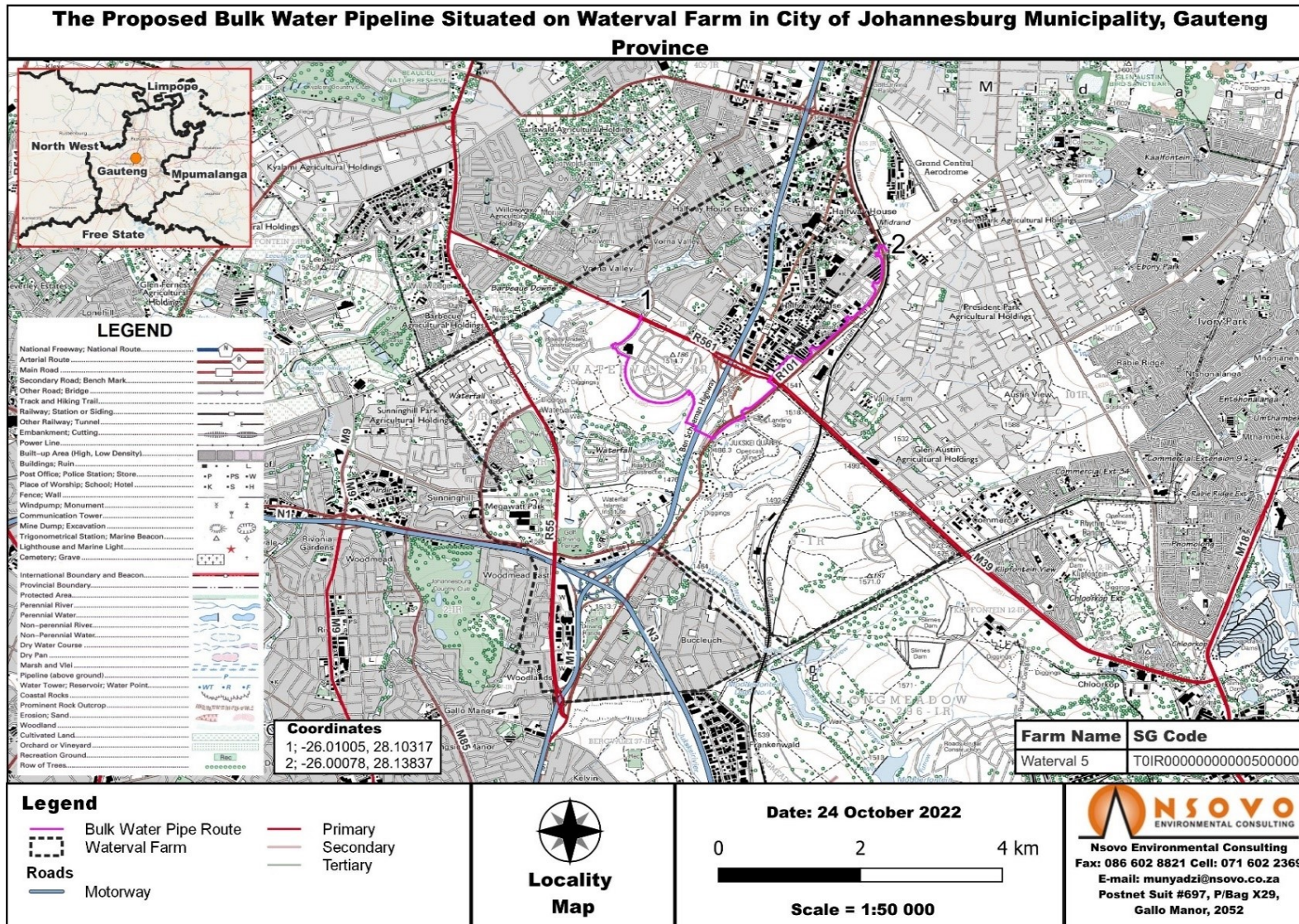


Figure 1: Locality Map

### 1.2.1. Description of the Locality

The proposed project traverses' various farms and the details of the farm are provided in **Appendix A**.

## 2. THE STRUCTURE OF THE EMPR

This report has been compiled in terms of the provisions contained within Appendix 4 of GN R. 982 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA): EIA Regulations of 2014, as amended. Table 1 below provides a summary of the NEMA requirements in terms of the Environmental Impact Assessment (EIA) Regulations and an indication of which section the supporting information and documentation can be found in this document.

**Table 1: 2014 NEMA EIA Regulations EMPr Report Content**

No	Requirement	Reference
1(1)(a)	Details of- i) The EAP who prepared the report; and ii) The expertise of the EAP, including Curriculum Vitae;	Section 3
1(1)(b)	A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Section 4
1(1)(c)	A map at an appropriate scale that superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;	Section 1
1(1)(d)	A description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed, and mitigated as identified through the environmental impact assessment process for all phases of the development including- (i) planning and design; (ii) pre-construction activities; (iii) construction activities; (iv) rehabilitation of the environment after construction and where applicable post-closure; and (v) where relevant, operation activities;	Section 5
1(1)(e)	A description and identification of impact management outcomes are required for the aspects contemplated in paragraph (d);	Section 5



No	Requirement	Reference
1(1)(f)	A description of proposed impact management actions, identifying the way the impact management outcomes contemplated in paragraph (d) will be achieved, and must, where applicable, include actions to- (i) avoid, modify, remedy, control or stop any action, activity, or process which causes pollution or environmental degradation; (ii) comply with any prescribed environmental management standards or practices; (iii) comply with any applicable provisions of the Act regarding the closure, where applicable; and (iv) comply with any provisions of the Act regarding financial provision for rehabilitation, where applicable;	Section 5
1(1)(g)	The method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 6
1(1)(h)	The frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 6
1(1)(i)	An indication of the persons who will be responsible for the implementation of the impact management actions;	Section 6
1(1)(j)	The periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Section 6
1(1)(k)	The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Section 7
1(1)(l)	A program for reporting on compliance, considering the requirements as prescribed by the Regulations;	Section 7
1(1)(m)	An environmental awareness plan describing how- (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii) risks must be dealt with to avoid pollution or the degradation of the environment; and	Section 8
1(1)(n)	Any specific information that may be required by the competent authority.	Section 10

### 3. DETAILS AND EXPERTISE OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER INCLUDING THE APPLICANT'S DETAILS, ORGANISATIONAL STRUCTURE, AND ROLES

### 3.1. DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

Nsovo has been appointed as the independent Environmental Assessment Practitioner (EAP) for the proposed development and meets the general requirements as stipulated in Regulations 13 (3) of the NEMA EIA 2014 Regulations as amended. Nsovo therefore is:

- Independent and Objective;
- Has expertise in conducting EIA's;
- Considers all relevant factors relating to the application; and
- Provides full disclosure to the applicant and the relevant environmental authority.

Table 2 below provides the details of the EAP and relevant experience. A detailed CV and qualifications of the EAP are attached as **Appendix B**.

**Table 2: Details of the Environmental Assessment Practitioner (EAP)**

<b>Name of Company</b>	Nsovo Environmental Consulting
<b>Person Responsible</b>	Rejoice Aphane
<b>Professional Registration</b>	EAP (EAPASA): Reg 2019/1277
<b>Postal Address</b>	40 Lyncon Road, Carlswald, Midrand, 1684
<b>Telephone Number</b>	087 803 9294
<b>Fax Number</b>	086 602 8821
<b>Email</b>	<a href="mailto:admin@nsovo.co.za">admin@nsovo.co.za</a>
<b>Qualifications &amp; Experience</b>	B.A in Environmental Management (UNISA) <b>10 years of experience</b>
<b>Project Related Expertise</b>	In terms of project-related expertise, the Environmental Assessment Practitioner has undertaken projects of varying scale and complexity, including: <ul style="list-style-type: none"> <li>• Integrated Environmental Impact Assessment and WULA for Exxaro discard dump expansion (2021).</li> <li>• Integrated Environmental Impact Assessment and WULA for Bushveld Vanchem Expansion project (2021).</li> <li>• Integrated Environmental Impact Assessment and WULA for Grammatikos Vogelfontein project (2021).</li> </ul>

	<ul style="list-style-type: none"> <li>• EIA for the proposed Tubatse Strengthening Phase 1 – Senakangwedi B integration within the jurisdiction of Greater Tubatse Local Municipality in Limpopo Province 2018).</li> <li>• EIA for the proposed Maphutha-Witkop powerline in Limpopo Province (2018).</li> <li>• EMPr, WULA, and EA amendment for the proposed Juno Gromis 400kV power line (2017).</li> </ul>
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### 3.2. DETAILS OF THE APPLICANT

This EMPr is a living document that guides the day-to-day activities throughout the project lifecycle; it may occasionally require revisions as the course of construction, operation, and rehabilitation/decommissioning activities may dictate. Therefore, preventive measures must be taken to ensure that environmental degradation is minimised while the project is undertaken. This will take a concerted effort from the project team and proper planning is of the utmost importance. This document applies to all Joburg Water employees, Contractors, and Sub-contractors for the Halfway house pipeline. Table 3 below indicates details of the Applicant also referred to as the developer.

**Table 3: Details of the Applicant**

<b>Name of Company</b>	Johannesburg Water SOC Limited
<b>Physical Address</b>	17 Harrison Street, Marshalltown, Johannesburg 2107
<b>Postal Address</b>	Same as above.
<b>Contact Person</b>	Joyce Ngobebe
<b>Responsible position</b>	Project Manager
<b>Telephone Number</b>	011 688 1443
<b>Cell</b>	071 609 7328
<b>Email address</b>	<a href="mailto:Joyce.ngobebe@jwater.co.za">Joyce.ngobebe@jwater.co.za</a>

### 3.3. ORGANISATIONAL STRUCTURE AND RESPONSIBILITIES

To operate with utmost care of the environment effectively and efficiently for the duration of the project, it is important that all parties understand their duties and responsibilities throughout all phases of the project lifecycle. Joburg Water and their duly appointed Contractors and Sub-contractors are fully responsible for all activities taking place and ensuring that they are undertaken in compliance with the project's EA and EMPr as well as world best practice. The following sections describe the roles and responsibilities of the key team members.

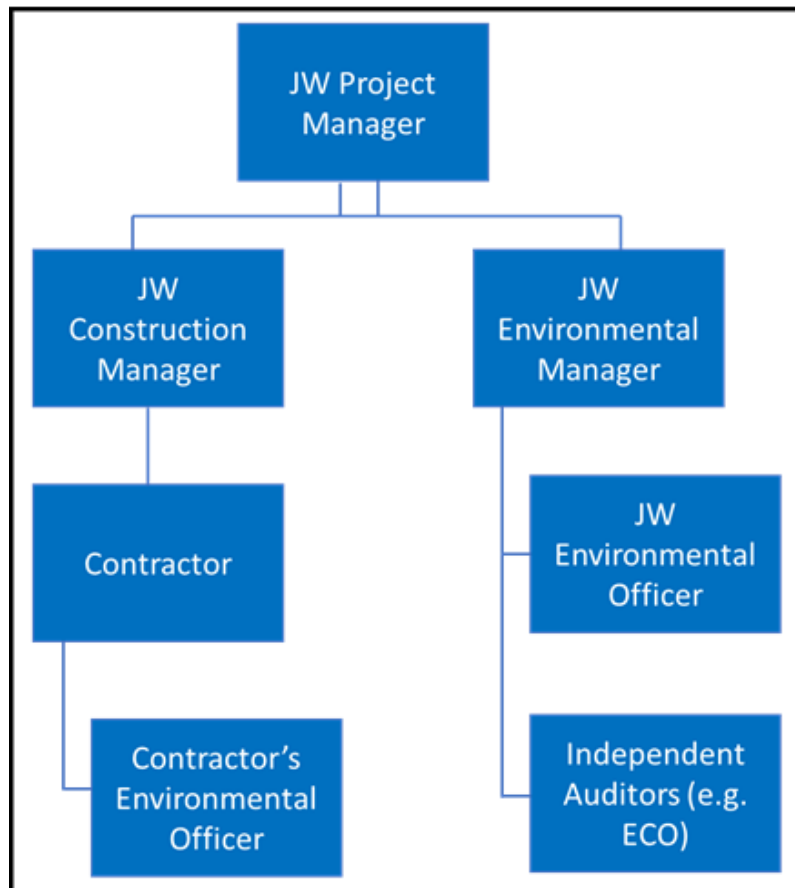


Figure 2: Typical Project Organogram

### 3.4. JOHANNESBURG WATER SOC LIMITED

Joburg Water must ensure the implementation and compliance of all environmental authorisations and permits and obligations emanating from other relevant environmental legislation throughout the project lifecycle. Formal responsibilities are necessary to ensure that key procedures are executed, and this would include the following:

- Ensuring that all team members are aware of their specific roles and responsibilities.
- Taking overall responsibility for all activities that occur in the proposed construction and associated infrastructure.
- Ensuring that all commitments/conditions contained in the EA and EMPr are communicated and adhered to by all Joburg Water employees, principal contractors, and Sub-contractors.

Specific responsibilities of Management, Environmental Control Officer, and Contractor during the construction, operation, and decommissioning phases are detailed below:

Joburg Water Management will:

- Appoint a Project Management Team to oversee the Contractor and all activities.
- Appoint an independent Environmental Control Officer (ECO).
- Ensure that the Contractor is aware of and adheres to the provisions of this EMPr.
- Ensure that the Contractor remedies problems or non-compliances timeously.
- Appoint a suitably qualified ECO to ensure that the Contractor abides by the EMPr; and
- Ensure that an independent ECO monitors and audits the site to ensure compliance with the respective authorisation, permits and licenses.

#### **3.4.1. Johannesburg Environmental Officer (JEO)**

The Joburg Water Environmental Officer will report to the Joburg Water Project Environmental Manager and will:

- Be fully knowledgeable of the contents of this EMPr and the conditions of the environmental authorization, and other permits.
- Be fully knowledgeable of the contents of all relevant environmental legislation and ensure effective compliance.
- Ensuring that Joburg Water and its contractors are made aware of all stipulations in the EMPr;
- Ensure compliance with the EMPr and EA commitments and any other legislative requirements applicable to their operations.
- Ensure there is effective communication with the Project Manager, the environmental control officer, and relevant project staff on matters concerning the environment; and
- Adhering to any instructions issued by the Project Manager on the advice of the ECO.

#### **3.4.2. Environmental Control Officer (ECO)**

A suitably qualified independent ECO must be appointed before the commencement of the construction activities. The ECO shall be responsible for monitoring, reviewing, and verifying compliance by the Contractor with the environmental specifications. In addition, the ECO shall be responsible for the planning and management of all environmental activities to ensure effective implementation of EA, EMPr, landowner conditions, applicable permits and licences. More specifically, the ECO will undertake the following responsibilities:

##### **Communication Services**

- To liaise closely with Joburg Water and the Contractor's Environmental Officer (EO).
- To assist in conflict resolution.
- To ensure that the Contractor rehabilitates any damage caused during construction.



## Environmental Management (EM)

- Monitoring site environmental progress regarding time, deliverables, and quality.
- Liaison between Authorities, Joburg Water and Contractor on environmental matters.
- Communicating changes of the EMPr to all relevant parties.
- Issuing Contractors Communications and site instructions.
- Monitoring performance of Contractor and sub-contractors to ensure compliance with environmental and statutory requirements.
- Checking the Contractor EO's record of environmental incidents (spills, impacts, legal transgressions, etc.) as well as corrective and preventive actions taken.
- Checking the Contractor EO's complaints register in which all complaints are recorded and actions taken.
- Compiling and completing the environmental management-related component of the handing-over documentation and any other related documents.
- Timeously identifying any sensitive site issues which may affect environmental aspects. This must be reported to Joburg Water.
- Monitoring that good housekeeping practices are followed and maintained by the Contractor.
- Monitoring that the ground rehabilitation is initiated on time, complying with the EA, EMPr and to the satisfaction of the landowner.
- Assisting the Contractor and Joburg Water EO with the environmental awareness training course to all site staff, targeted at the level of the workers so that they have a basic understanding of the environment that they are working in.
- Ensuring that sensitive areas are demarcated within or alongside the construction areas i.e., sites identified in the EMPr, EA.

## Monitoring

- Validating the site environmental monitoring plan.
- Carrying out environmental surveillances.
- Validating and recording of certificates proving the legal disposal of waste streams.

## Reporting

- To complete a daily diary and monthly reporting.
- To prepare monthly monitoring reports for submission to Joburg Water and the GDARD Environmental Compliance Section as and when required.
- Manage the compliance of the Contractor according to the EA, and EMPr. The reports are to include photographic images of compliances, non-compliances and special occurrences taking place during the reporting period.

- To attend site meetings as required.
- To inform Joburg Water of any activity that is not in accordance with the EA and respective conditions, the EMPr and special conditions or detrimental to the environment.

#### **Administration**

- To ensure a proper site ECO administration function to cater to all environmental site-related correspondence.
- To execute environmental responsibilities as per Joburg Water Risk Management System.
- To promote and maintain sound relationships with the landowners, community, Contractors, and suppliers.

#### **3.4.3. Contractor (including Sub-Contractors)**

The Contractor (including Sub-Contractors) will report to the Project Management Team and be responsible for:

- The appointment of an Environmental Officer who will ensure that all construction activities on site are undertaken in accordance with the EMPr.
- To fulfil all obligations as per the agreed contract.
- To implement the project as per the approved project plan.
- Drafting Environmental Method Statements for all activities to mitigate environmental impacts.
- Informing the workforce regarding their roles and responsibilities in terms of the EMPr.
- Ensuring that the workforce and Sub-contractors comply with this EMPr.
- Ensuring compliance with the EMPr and EA commitments and any other legislative requirements applicable to their activities.
- Adhering to any instructions issued by the Project Manager on advice of the ECO.
- Preparation and timeous submission of environmental compliance reports that include updated incident and complaints registers.
- Induction and training of their employees as well as Sub-contractors prior to the commencement of construction, taking cognisance of this EMPr and EA.
- To inform and educate all employees about the environmental risks associated with the different construction activities through toolbox talks, environmental notices, and other methods with specific focus on environmental topics throughout the project.
- To provide all necessary supervision during the execution of the project and must always be available on site.
- To ensure that implementation is conducted in line with the EA and EMPr.
- To comply with special conditions as stipulated by Landowners during the negotiation process.
- Ensure compliance with pertinent environmental legislations and other legally binding documents.

### 3.5. COMPETENT AUTHORITY

The authorising department is the Gauteng Department of Agriculture and Rural Development (GDARD) and their role is to enforce compliance with the EA and EMPr conditions.

### 4. A DETAILED DESCRIPTION OF OF THE ASPECTS OF THE ACTIVITIES THAT ARE COVERED BY THE EMPR AS IDENTIFIED BY THE PROJECT DESCRIPTION

This EMPr is part of the Basic Assessment process for the proposed upgrade of the Joburg Water bulk water pipeline. Subsequently, the EMPr incorporates measures for the construction, operation, and decommissioning activities associated with the proposed project, which includes the following aspects in Table 4 below.

**Table 4: Details of the proposed activities**

Pipe diameter(mm)	Approximate pipe length (km)	Supply/Feeder Pipe	Pipe battery limits
600 mm	3 km	Feeder	Start from the existing water meter chamber to the proposed 25ML Halfway House Reservoir.
700 mm	1.4 km	Supply	From the proposed 25ML Halfway House Reservoir to connection point at start of existing 800mm diameter steel pipeline.
700 mm	2.8 km	Supply	From connection point at the end of existing 800mm diameter steel pipeline and connecting to new 600mm diameter pipeline.
600 mm	0.6 km	Supply	From connection to new 700mm diameter pipeline and connecting to new 500mm diameter pipeline.
500 mm	68m	Supply	From connection to new 600mm diameter pipeline and connecting to existing reticulation at Allendale and Harry Galaun Dr.

## 4.1. DESCRIPTION OF STRUCTURES AND INFRASTRUCTURE

### 4.1.1. Proposed Activities

As detailed above, Joburg Water proposes upgrading and installing approximately 7km bulk water pipeline from Dale Road and K101 Old Pretoria Main Road intersection in Halfway House, to Allandale Road and Harry Galaun Drive intersection in Waterfall. Refer to **Error! Reference source not found.** below.



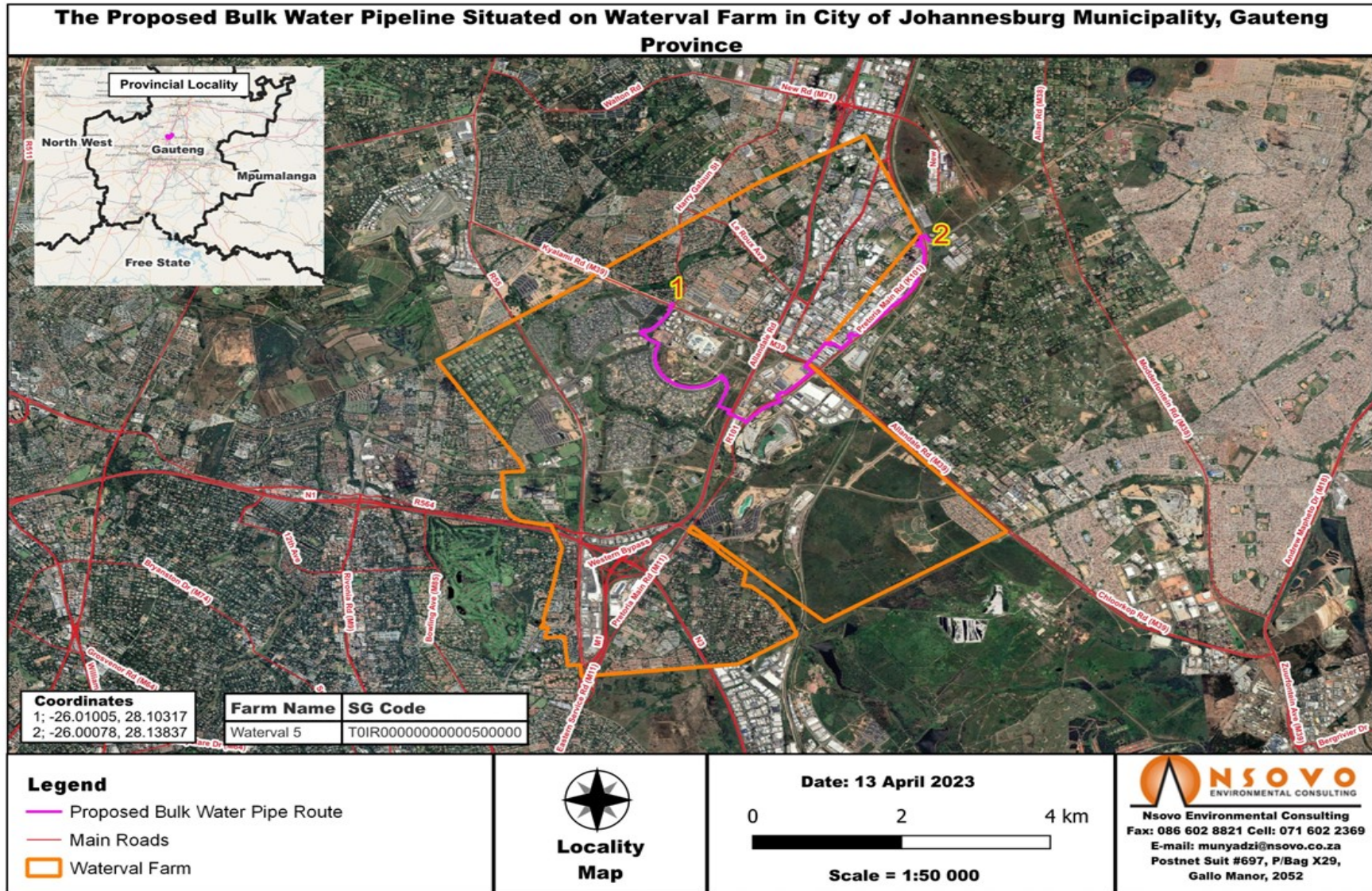


Figure 3: Map depicting the pipeline.

The proposed development triggers the NEMA EIA listed activities; as such, Joburg Water must undertake the Basic Assessment (BA) process to obtain an environmental authorisation before construction of the above-mentioned activities in accordance with the EIA Regulations, 2014 (promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), as amended. The listed activities applicable are listed and briefly described in Table 5 below:

**Table 5: Listed activities under the National Environmental Management Act (Act 107 of 1998) triggered by the proposed development.**

Listed Activities	Applicability on the Application
<b>GN R 983: Activity 19, Listing 1</b>	
(a) The infilling or depositing of any material of more than 10 cubic meters into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles, or rock of more than 10 cubic meters from (i) a watercourse	The proposed pipeline will include the excavations.
<b>GN R 985: Activity 14, Listing 3</b>	
The development of— (ii) infrastructure or structures with a physical footprint of 10 square meters or more; where such development occurs— (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback has been adopted, within meters of a watercourse, measured from the edge of a watercourse.	The footprint of the proposed pipeline within the existing road reserve, crossing the watercourse is equivalent to 82.5m <sup>2</sup> (55m length of pipe with trench excavation of 1.5m in width).

**5. A MAP AT AN APPROPRIATE SCALE THAT SUPERIMPOSES THE PROPOSED ACTIVITY, ITS ASSOCIATED STRUCTURES, AND INFRASTRUCTURE ON THE ENVIRONMENTAL SENSITIVITIES OF THE PREFERRED SITE, INDICATING ANY AREAS THAT SHOULD BE AVOIDED, INCLUDING BUFFERS**

Based on the baseline environment of the proposed upgrade, a sensitivity mapping has been developed to identify areas of sensitivity and create both regulated and non-regulated buffers to protect and preserve such areas. The sensitivity map below (Figure 4) and attached as Appendix A indicates the proposed project's servitude in relation to the sensitive areas.

Gauteng C-Plan indicates that the site is within an Ecological Support Area (ESA); however, the site assessment showed that the industrial and residential buildings have transformed the area.



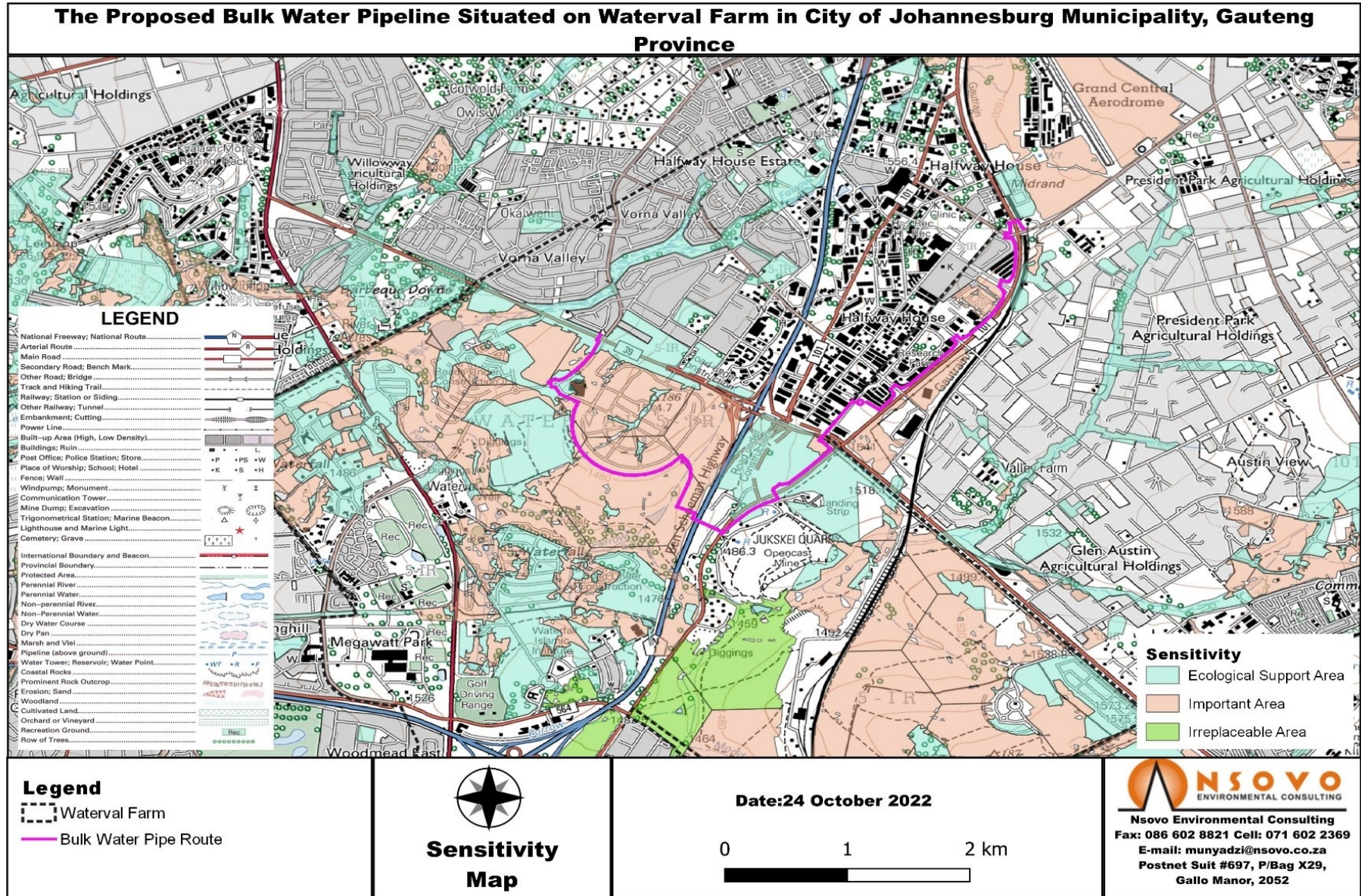


Figure 4: Sensitivity Map for the proposed pipeline

## 6. A DESCRIPTION OF THE IMPACT MANAGEMENT OUTCOMES, INCLUDING MANAGEMENT STATEMENTS, IDENTIFYING THE IMPACTS AND RISKS THAT NEED TO BE AVOIDED, MANAGED AND MITIGATED AS IDENTIFIED THROUGH THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS FOR ALL PHASES IMPACT MANAGEMENT OUTCOMES

### 6.1. IDENTIFIED RISKS THAT NEED TO BE AVOIDED

The tables below provide the impacts identified for the project's construction, operational, and decommissioning phases. The risk identification was guided by the findings of specialist studies undertaken as part of this plan and are summarized according to the project phases, as follows:

#### 6.1.1. Construction Phase

**Table 6: Impacts identified for construction.**

Aspect	Impact
<b>Construction Activities</b>	
Movement of construction personnel	<ul style="list-style-type: none"> <li>• Impact on sensitive environments</li> <li>• Trespassing</li> <li>• Safety and security</li> </ul>
Site preparation and excavations	<ul style="list-style-type: none"> <li>• Loss of topsoil</li> <li>• Increase in soil erosion</li> <li>• Contamination of soil</li> <li>• Disturbance of fauna</li> <li>• Damage to flora</li> <li>• Contamination of ground and surface water</li> <li>• Generation of dust</li> <li>• Generation of waste</li> </ul>
Vehicle movement and refuelling activities	<ul style="list-style-type: none"> <li>• Damage to sensitive areas.</li> <li>• Erosion and loss of topsoil.</li> <li>• Generation of dust.</li> <li>• Contamination of soil.</li> <li>• Fuel spillages could potentially contaminate ground and surface water resources.</li> </ul>

### 6.2. IMPACT MANAGEMENT OUTCOMES

Table 7 below outlines the range of approaches to be implemented to manage the potential environmental impacts/risk of the project activities throughout the project cycle.



**Table 7: Approach to Impact Management**

Impact Management	Description
Avoidance	Avoiding activities that could result in adverse impacts and/or resources or areas considered sensitive.
Prevention	Preventing the occurrence of negative environmental impacts and/or preventing such an occurrence from having negative impacts.
Preservation	Preventing any future actions that might adversely affect an environmental resource.
Minimisation	Limiting or reducing the degree, extent, magnitude, or duration of adverse impacts
Mitigation	Measures are taken to minimise adverse impacts on the environment.
Enhancement	Magnifying and/or improving the positive effects or benefits of a project.
Rehabilitation	Repairing affected resources, such as natural habitats or water resources.
Restoration	Restoring affected resources to an earlier (more stable and productive) state, typically 'background' or 'pristine' condition. These resources may include soils and biodiversity.
Compensation	Compensating for lost resources, and where possible, the creation, enhancement, or protection of the same type of resource at another suitable and acceptable location.

Following a detailed description of the impact management approaches, this section describes the impact management outcomes, including management statements, identifying the impacts and risks that must be avoided, managed, and mitigated throughout all phases.

**6.2.1. Pre-Construction Phase**

**Table 8: Pre-construction Objectives**

Aspect	Objective
Social	<ul style="list-style-type: none"> <li>• To increase local employment.</li> <li>• To reduce the impacts on local cultural sense of place.</li> <li>• To minimise social pathogens and unhealthy behaviour.</li> <li>• Protection of archaeological, historical, and any other site or land considered of cultural value.</li> </ul>
Soil	<ul style="list-style-type: none"> <li>• To prevent erosion, sedimentation, surface water contamination, and reduction in water quality.</li> <li>• To minimise land use alternation and soil erosion.</li> </ul>
Biodiversity	<ul style="list-style-type: none"> <li>• To ensure adequate planning to prevent habitat destruction.</li> <li>• To prevent a significant increase in alien invasive species abundance and spread and to prevent habitat fragmentation with specific reference to the proposed activities.</li> </ul>

	<ul style="list-style-type: none"> <li>To conserve species of conservation concern.</li> </ul>
Sensitive Environments	To prevent the destruction of the aquatic ecosystem at the river crossing.

### 6.3. CONSTRUCTION PHASE

**Table 9: Construction Objectives**

Aspect	Objective
Social	<ul style="list-style-type: none"> <li>To protect the social-economic environment of local land users.</li> <li>To support the local economy through the utilisation of local resources.</li> <li>To conserve heritage artefacts and buildings.</li> <li>To minimise impacts on infrastructure and land occupiers during excavation and piling activities.</li> </ul>
Water	<ul style="list-style-type: none"> <li>To prevent groundwater contamination.</li> <li>To protect surface water flow, water quality, and associated pollution.</li> <li>To conserve water usage during construction.</li> </ul>
Air Quality	<ul style="list-style-type: none"> <li>To minimise emissions to the atmosphere affecting employees, local land users, and climate change.</li> <li>To reduce greenhouse gas emissions.</li> </ul>
Soil	<ul style="list-style-type: none"> <li>To prevent soil contamination and ensure rehabilitation of contamination.</li> </ul>
Biodiversity	<ul style="list-style-type: none"> <li>To prevent a significant increase in alien invasive species abundance and spread.</li> <li>To minimise the loss of floral habitat.</li> <li>To minimise loss of floral biodiversity.</li> <li>To protect floral habitats and diversity.</li> <li>To reduce the impacts on faunal ecological integrity by curbing erosion.</li> <li>To minimise cumulative loss of natural vegetation in the region.</li> </ul>
Sensitive Environments	<ul style="list-style-type: none"> <li>To protect the river's integrity and function.</li> <li>To protect the identified avifaunal-sensitive area (ESA).</li> </ul>

### 7. LEGISLATIVE FRAMEWORK

This section lists and describes the acts and legislation relevant to the proposed project. In addition to the national legislative requirements, the EMP must take equal cognisance of Joburg Water's internal policies and best practices. Table 10 below provides a list of policies and guidelines that must be applied to ensure effective management of the environment.

**Table 10: Legislation pertaining to the proposed project.**

Aspect	Relevant Legislation	Brief Description
Environment	National Environmental Management: Act 1998, (Act No. 107 of 1998)	<p>The overarching principles of sound environmental responsibility are reflected in the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA).</p> <p>The principles set out in the National Environmental Management Act, 1998 (Act No. 107 of 1998), hereafter, referred to as NEMA, apply to all listed projects. Construction and operation must be conducted in line with the generally accepted principles of sustainable development, integrating social, economic, and environmental factors.</p> <p>The BA process followed complies with the NEMA and the EIA Regulations of December 2014 as amended. The proposed development involves “listed activities,” as defined by NEMA. Listed activities are an activity that may potentially have detrimental impacts on the environment and therefore require an EA from the relevant Competent Authority, in this, case GDARD. To enable the Council to protect and promote the long-term health and well-being of people in the municipal area</p>
	Regulations GN. R. 982, 983, 984 and 985 promulgated under Chapter 5 of the National Environmental Management Act (NEMA, Act 107 of 1998) in Government Gazette 38282 on 4 December 2014 as amended	<p>GDARD is the provincial authority to implement the Regulations for Environmental Impact Assessment in Gauteng as such this application for an Environmental Authorisation is being lodged with GDARD.</p> <p>Some of the activities to be undertaken as part of the project are indicated in Listing Notice 1 (GN.R 983 of 2014, as amended) and Listing Notice 3 (GN.R 985 of 2014, as amended). As such this Basic Assessment process follows the Environmental Impact Assessment Regulations of 2014 (Government Notice No R982 of December 2014, as amended).</p>
	Gauteng Provincial Environmental	The purpose of the Framework is to guide protection and enhancement of environmental assets, natural resources along with development patterns to ensure sustainable

Aspect	Relevant Legislation	Brief Description
	<p>Management Framework (GPEMF)</p>	<p>environmental management and development patterns within and around the Gauteng Province.</p> <p>Its objectives include efficiency in urban development, optimal use of land, to protect Critical Biodiversity Areas (CBAs as defined in the revised C-Plan 3.3) within urban and rural environments and to use ESA's as defined in municipal bioregional plans in spatial planning of urban open space corridors and links within urban areas.</p> <p>The proposed development falls within:</p> <p><b><u>Zone 1 (urban development zone):</u></b></p> <p>The intention with Zone 1 is to streamline urban development activities in it and to promote development infill, densification, and concentration of urban development within the urban development zones as defined in the Gauteng Spatial Development Framework (GSDF), in order to establish a more effective and efficient city region that will minimise urban sprawl into rural areas.</p> <p>Certain currently listed activities may be exempted from environmental assessment requirements at the discretion of the competent authority.</p> <ul style="list-style-type: none"> <li>• Development in this area must be sustainable in respect to the capacity of the environment and specifically the hydrological system to absorb additional sewage and stormwater loads as a result of increased densities;</li> <li>• Existing open spaces and urban parks should be retained as open space to cater for the open space needs of the foreseen increased densities; and</li> <li>• Stormwater drainage must be in accordance with the Water Research Commission Report, 2012 and the South African Guidelines for Sustainable Drainage Systems.</li> </ul> <p><b><u>Zone 5 (industrial and large commercial focus zone).</u></b></p>

Aspect	Relevant Legislation	Brief Description
		<p>The intention with Zone 5 is to streamline non-polluting industrial and large-scale commercial (warehouses etc.) activities in areas that are already used for such purposes and areas that are severely degraded but near required infrastructure (such as old and even current mining areas). Certain currently listed activities, in addition to those intended for Zone 1 may be excluded from environmental assessment requirements in this zone in future.</p> <ul style="list-style-type: none"> <li>• Development in this area must be sustainable in respect to the capacity of the environment and specifically the hydrological system to absorb additional sewage and stormwater loads of increased densities; and</li> <li>• Development in this area must identify any unmapped wetlands, especially seep areas that may occur on any site and when necessary, apply for the required water use licence.</li> <li>• Non-polluting Industrial promotion areas where selected activities are to be excluded from EIA processes in addition to those excluded in Zone 1.</li> </ul>
Biodiversity	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	<p>The purpose of the National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) is to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA and the protection of species and ecosystems that warrant national protection. As part of its implementation strategy, the National Spatial Biodiversity Assessment was developed. This Act is applicable to this application for Environmental Authorisation, as it requires the project applicant to consider the protection and management of local biodiversity.</p>
Protected Areas	National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)	<p>The purpose of this Act is to provide for the protection, conservation, and management of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes.</p>

Aspect	Relevant Legislation	Brief Description
	Gauteng Conservation Plan 3.3	<p>According to the Gauteng C-Plan the site is partially located in an Ecological Support Area (ESA), as well as an Important Area.</p> <p>Sensitive and Important areas within the proposed area should be conserved and where linear development (roads etc.) cannot avoid these areas, a proper assessment and implementation of alternatives should be undertaken.</p> <p>The C-Plan was considered in the compilation of this Basic Assessment Report (BAR).</p>
	Red List Plant Species Guidelines	<p>The purpose of these guidelines is the promotion and conservation of the Red List Plant Species in Gauteng, these are species of flora that face risk of extinction in the wild.</p> <p>By protecting Red List Plant Species, conservation of diverse landscapes is promoted which forms part of the overall environmental preservation of diverse ecosystems, habitats, communities, populations, species, and genes in Gauteng.</p> <p>There are no Red Listed plant species found on the area proposed for the development.</p>
Heritage Resources	National Heritage Resources Act, 1999 (Act No. 25 of 1999)	<p>The National Heritage Resources Act, 1999 (Act No. 25 of 1999) legislates the necessity for cultural and heritage impact assessment in areas earmarked for development, which exceed 0.5 ha and where linear developments (including roads) exceed 300 meters in length.</p> <p>The Act makes provision for the potential destruction to existing sites, pending the archaeologist's recommendations through permitting procedures. Permits are administered by the South African Heritage Resources Agency (SAHRA).</p>
Air quality management and control	National Environmental Management: Air Quality	<p>The object of the Act is to protect the environment by providing reasonable measures for the protection and enhancement of the quality of air and to prevent pollution of air and ecological degradation.</p>

Aspect	Relevant Legislation	Brief Description
	Act, 2004 (Act 39 of 2004)	Section 32 of The National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004) deals with dust control measures in respect of dust control.
Noise Management and Control	Noise Control Regulations in terms of the Environmental Conservation, 1989 (Act 73 of 1989)	<p>The assessment of impacts relating to noise pollution management and control, where appropriate, must form part of the EMPr.</p> <p>Applicable laws regarding noise management and control refer to the National Noise Control Regulations issued in terms of the Environment Conservation, 1989 (Act 73 of 1989).</p>
	Gauteng Noise Control Regulations	Practical mitigation measures for noise pollution are low, but certain measures can be implemented to mitigate the severity. These measures have been provided for in the EMPr.
Water	National Water Act, 1998 (Act 36 of 1998)	<p>The National Water Act, 1998 (Act No. 36 of 1998) (NWA) aims to provide management of the national water resources to achieve sustainable use of water for the benefit of all water users. This requires that the quality of water resources is protected as well as integrated management of water resources with the delegation of powers to institutions at the regional or catchment level.</p> <p>The purpose of the Act is to ensure that the nation's water resources are protected, used, developed, conserved, managed, and controlled in responsible ways. Of specific importance to this application is Section 19 of the NWA, which states that an owner of land, a person in control of land or a person who occupies or uses the land which thereby causes, has caused or is likely to cause pollution of a water resource must take all reasonable measures to prevent any such pollution from occurring, continuing or recurring and must therefore comply with any prescribed waste standard or management practices.</p>

Aspect	Relevant Legislation	Brief Description
Waste Management	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)	No waste management license would be required for the construction or operational phases of the proposed activity. Only a limited amount of solid construction waste will be stored and handled on the site, before being hauled away and dumped at the nearest registered landfill site, such as Chlookop Landfill.
Agricultural Resources	Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)	The Act aims to provide for control over the utilization of natural agricultural resources to promote the conservation of the soil, water resources and vegetation and to combat weeds and invader plants. Section 6 of the Act makes provision for control measures to be applied to achieve the objectives of the Act.
Health and Safety	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. The EMPr provides for measures to ensure that objectives of the Act are met on this site.
Human	The Constitution of South Africa, 1996 (Act No. 108 of 1996)	<p>The Constitution of South Africa, 1996 (Act No. 108 of 1996) in Section 24 states that the people of South Africa have a right to an environment that is not detrimental to human health. The Constitution states:</p> <p><b>“Everyone has the right -</b></p> <ul style="list-style-type: none"> <li>a) To an environment that is not harmful to their health or well-being; and</li> <li>b) To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that - <ul style="list-style-type: none"> <li>-Prevent pollution and ecological degradation.</li> <li>-Promote conservation; and</li> <li>-Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.”</li> </ul> </li> </ul>



## 7.1. METHOD STATEMENTS FOR THE ACTIVITIES TO BE CONDUCTED

The environmental specifications are required to be underpinned by a series of Method Statements (MS), within which the Contractors and Service Providers are required to outline how any identified environmental risks will be mitigated and managed for the duration of the contract and how specifications within this EMPr will be met. The Contractor will be required to describe how specified requirements will be achieved by submitting written Method Statements to Joburg Water before the commencement of activities on site. In addition, the Method Statements must cover relevant details regarding:

- Vegetation clearing;
- Fauna and flora management;
- Excavations for pipe laying
- Chemical/hazardous substance storage;
- Cement/concrete use;
- Logistics of the environmental awareness training;
- Fire management;
- Emergency Response;
- Storm water and soil erosion management;
- Waste management;
- Access road(s);
- Contaminated water management;
- Site establishment and site layout plan;
- Temporary site closure;
- Site Rehabilitation;
- Dust control protocol

The above is not an exhaustive list of the required MS; additional MS may be as the project progresses.

## 8. DESCRIPTION OF MITIGATION MEASURES

This section prescribes mitigation measures to prevent, reduce, eliminate, or compensate for impacts to acceptable/insignificant levels.

### 8.1. PRE-CONSTRUCTION MANAGEMENT PROGRAMME

The pre-construction management programme is to be used as a guide during the planning, design and detailing of the development components. All involved in decision-making during the planning and design phases should reference this part of the programme. The responsible agents indicated in Table 11 are abbreviated as follows:

**Table 11: Responsible Agent**

Title	Abbreviation
Contractor Environmental Officer	CEO
Johannesburg Water SOC Limited	Joburg Water
Environmental Control Officer	ECO

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
To ensure that proper environmental conditions are established prior to commencement of construction activities by informing all parties of appropriate environmental protection measures.	<ul style="list-style-type: none"> <li>The project must be designed with consideration for the environment.</li> <li>The successful tendering Contractors/third parties must be made aware of the contents of this EMPr and any penalties arising from non-compliance prior to the commencement of the work.</li> <li>Appoint a suitably qualified environmental manager who must be responsible to monitor compliance with the EMPr.</li> </ul>	<ul style="list-style-type: none"> <li>Signed Declaration by Contractor</li> <li>Appointment Letter</li> <li>Design Report</li> <li>Proof of submission of ECO appointment of GDARD</li> </ul>	Joburg Water	Pre-Construction

## 8.2. CONSTRUCTION ENVIRONMENTAL MANAGEMENT PROGRAMME

This section relates to the construction activities at Joburg Water and may also be implemented during any other construction activities that do not trigger the listed activities.

### 8.2.1. Site Establishment

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
Disturbance on the natural environment.  Disturbance of soil and vegetation.	To ensure minimal disturbance on site during the site establishment.	NEMA (36 of 1998).  Construction Regulations.	<b>Site Plan:</b> <ul style="list-style-type: none"> <li>A layout plan for construction activities needs to be developed and approved by the Environmental Site Manager.</li> <li>Documentation for the proposed camp site should be prepared by the Contractor prior to the commencement of construction activities. This documentation must include, but not limited to the following:                             <ul style="list-style-type: none"> <li>Site access (including entry and exit points).</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Observation</li> <li>Site Plan</li> <li>Landowner agreements</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> <li>Contractor</li> <li>CEO</li> </ul>	Prior to site establishment

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<ul style="list-style-type: none"> <li>○ All material and equipment storage areas including storage areas for hazardous substances.</li> <li>○ Construction offices and other structures.</li> <li>○ Security requirements including temporary and permanent fencing, and lighting.</li> <li>○ Solid waste management facilities.</li> <li>○ Storm water control measures.</li> <li>○ Provision of potable water and mobile chemical ablution facilities.</li> </ul> <p>Throughout the period of construction, the Contractor shall restrict all activities to the designated areas as per the construction layout plan. Any modification of the construction layout plan is to be approved by the ECO.</p> <p><b>Site Camps:</b></p> <ul style="list-style-type: none"> <li>● Construction camps must not be located on a sensitive site or infringe on adjacent property owners. Where applicable camps should be in an area with existing infrastructure where minimal clearing will be required.</li> <li>● Invite the Environmental Officer for the site inspection of proposed site camp prior establishment.</li> <li>● Submit a method statement for Site Camp establishment for approval by JW Environmental Officer/ECO prior commencement of works.</li> </ul>			

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<ul style="list-style-type: none"> <li>• After the completion of the construction activities, the site camp must be rehabilitated as per the Method Statement and disestablishment should be signed off by the ECO and the landowner.</li> </ul> <p>The following restrictions in the site camp should be communicated to all the construction staff in general:</p> <ul style="list-style-type: none"> <li>• The use of rivers and streams for washing of clothes.</li> <li>• The use of welding equipment, oxyacetylene torches, and other bare flames where veld fires constitute a hazard.</li> <li>• Indiscriminate disposal of waste or rubble littering of the site.</li> <li>• Spillage of potential pollutants, such as petroleum products.</li> <li>• Collection of firewood.</li> <li>• No poaching of any form is allowed.</li> <li>• Use of surrounding veld as toilets.</li> <li>• Burning of wastes and cleared vegetation.</li> </ul> <p><b>Vegetation clearing:</b></p> <ul style="list-style-type: none"> <li>• The natural vegetation encountered on site is to be conserved and left intact as much as possible.</li> <li>• Only trees and shrubs directly affected by the works in writing may be felled or cleared with written permission from the ECO.</li> </ul> <p><b>Water for human consumption:</b></p> <ul style="list-style-type: none"> <li>• Water for human consumption should be always available at the site offices and at other convenient locations.</li> </ul>			

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<p><b>Ablution facilities:</b></p> <ul style="list-style-type: none"> <li>• Chemical toilets must be supplied (1 per 15 persons) and must be regularly cleaned and maintained by the Contractor.</li> <li>• Area for the placement of the ablution facilities must be determined by the Contractor.</li> <li>• The Contractor should arrange for regular emptying of toilets and will be entirely responsible for enforcing their use and for maintenance.</li> </ul>			

**8.2.2. Environmental Induction Training**

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
Destruction of the environment due to inadequate knowledge of staff	<ul style="list-style-type: none"> <li>• To ensure that all employees/staff conducting work on-site understand their duty to care for the environment and are aware of the requirements of this EMP.</li> </ul>	NEMA (107 of 1998) and the relevant SEMAs	<ul style="list-style-type: none"> <li>• All staff must undergo environmental induction training before conducting any work on-site.</li> </ul>	<ul style="list-style-type: none"> <li>• Environmental Induction Material</li> <li>• Environmental Induction Attendance Registers</li> </ul>	CEO	Before construction activities commence and as and when required.

### 8.2.3. Terrestrial Biodiversity

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>• Impact on sensitive ecology.</li> <li>• Damage to protected/endangered vegetation.</li> <li>• Damage to topsoil.</li> <li>• Damage/loss of habitat.</li> <li>• Negative impact on animal life.</li> <li>• Negative impact on animal life.</li> </ul>	<ul style="list-style-type: none"> <li>• To ensure that the sensitive area is not disturbed.</li> <li>• To prevent and reduce the negative impact to the vegetation on and around the site.</li> <li>• To prevent the invasion by alien invasive species.</li> <li>• To ensure that the rehabilitation of indigenous vegetation is as close to the original state as possible.</li> <li>• To conserve animal life.</li> <li>• To ensure that impact on natural vegetation is kept to the minimum in order to conserve suitable habitats as much as possible.</li> </ul>	<ul style="list-style-type: none"> <li>• NEM: BA (10 of 2004).</li> </ul>	<ul style="list-style-type: none"> <li>• Demarcate the construction footprint.</li> <li>• Demarcate all ecologically “sensitive” areas to the contractors (e.g., red data habitats and species, rivers, streams, wetlands, sensitive soils, steep slopes, and areas susceptible to erosion);</li> <li>• The access barriers must be maintained in good condition throughout the course of the construction.</li> <li>• Only vegetation directly affected by the works may be felled or cleared. No bush clearing to be undertaken without the knowledge thereof by the property owner.</li> <li>• The natural vegetation encountered on the site is to be conserved and left intact as much as possible.</li> <li>• Only manual removal of weed will be permitted on site. Chemical and mechanical (Tlb’s) control is not allowed on site.</li> <li>• All exotic invaders and weeds must be eradicated.</li> <li>• No invasive or exotic plant species should be planted in the road reserves.</li> <li>• No fauna species should be disturbed, trapped, hunted, or killed during the construction phase.</li> <li>• Conservation orientated clauses should be built into contracts for construction personnel, complete with penalty clauses for non-compliance.</li> <li>• No open fires are permitted.</li> </ul>	<ul style="list-style-type: none"> <li>• Observation</li> <li>• ECO to monitor.</li> <li>• Site plan</li> <li>• Observation</li> <li>• Complaints register</li> <li>• Daily inspection</li> </ul>	<ul style="list-style-type: none"> <li>• ECO</li> <li>• Contractor</li> <li>• Mine Manager</li> <li>• Construction workers</li> <li>• CEO</li> <li>• Project manager</li> </ul>	<p>Before and during the construction phase.</p>

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
	<ul style="list-style-type: none"> <li>• To prevent degradation of suitable sensitive fauna habitats.</li> <li>• To prevent contamination of the nearby water resources thereby preserving several amphibian/aquatic species.</li> <li>• To ensure that ecological linkages are maintained along the pipeline route.</li> <li>•</li> </ul>		<ul style="list-style-type: none"> <li>• No hunting of fauna shall be allowed by the Contractor. Offenders shall be prosecuted.</li> <li>• Any animals found should be relocated to the conservation areas in the vicinity.</li> <li>• Wood harvesting of any trees or shrubs on the study area or adjacent areas shall not be allowed.</li> <li>• Any open excavations must be inspected early morning prior to the daily construction activities.</li> <li>• Any amphibians and small mammals or any other fauna species found should be removed and released in suitable habitats away from construction activities.</li> <li>• Records of any injured or deaths of fauna within the construction servitude must be kept by the ECO.</li> <li>• Construction should be restricted to daylight hours to prevent any disturbance such as floodlights.</li> <li>• Ensure that landscaping specialists is appointed to undertake the rehabilitation as per the Jobur Water requirements (EMP rev 05).</li> <li>• Ensure that JW EO, ECO and Site Environmental Officer is invited for the practical inspection and completion inspection after the completion of the rehabilitation on site.</li> <li>• The snag list is to be compiled and accepted by all parties (JW CAPEX Representatives, JW environmental section as applicable, and appointed Contractor) All responsible</li> </ul>			



Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			personnel including Environmental representatives sign both practical and final completion letter.			

**8.2.4. Heritage And/or Archaeological Sites**

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
Destruction of sites of archaeological and heritage significance.	<ul style="list-style-type: none"> <li>To preserve any heritage, cultural or archaeological sites that might be encountered during the construction phase.</li> </ul>	NHRA (25 of 1999)	<p>If any heritage or archaeological artifacts or graves be found, the following measures must be implemented:</p> <ul style="list-style-type: none"> <li>Construction must be stopped, and a professional archaeologist be consulted.</li> <li>The area should then be demarcated by a danger tape.</li> <li>A professional archaeologist or SAHRA should be contacted immediately to arrange for a registered heritage specialist for inspection, and if necessary, excavate the material, subject to acquiring the necessary approval.</li> <li>All work within the construction area must cease until written permission has been received from the SAHRA.</li> <li>Under no circumstances may any heritage material be destroyed or removed from site. Furthermore, until the necessary approval has been obtained from SAHRA.</li> <li>Any measure to cover up the suspected archaeological material or to collect any resources is illegal and punishable by law under Section 35(4) and 36(3) of the NHRA, Act 25 of 1999.</li> </ul>	Intermittent observation.	ECO Contractor CEO Archaeologist	On-going during all excavations

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<ul style="list-style-type: none"> <li>The Contractor must induct field workers about archaeology, and steps that should be taken in the case of exposing archaeological materials. This induction must include information on:                             <ul style="list-style-type: none"> <li>Flaked stone tools, bone tools, and loose pieces of flaked stone;</li> <li>Ash and charcoal;</li> <li>Bones and shell fragments;</li> <li>Artefacts (e.g., beads or hearths)</li> </ul> </li> </ul>			

**8.2.5. Surface and Groundwater Management**

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
Pollution of ground and surface water.	<ul style="list-style-type: none"> <li>To prevent the pollution of the ground and surface water resources.</li> <li>To prevent the siltation of stormwater infrastructure.</li> <li>To ensure effective water management.</li> <li>To ensure that the rivers and streams are</li> </ul>	NWA (36 of 1998)	<ul style="list-style-type: none"> <li>Increased run-off during construction must be managed using berms and other suitable structures as required to ensure flow velocities are reduced.</li> <li>The Contractor shall ensure that excessive quantities of sand, silt and silted water do not enter the stormwater system.</li> <li>Drainage channels should be constructed on site to convey stormwater to sand/silt traps for removal of soil particles.</li> <li>The Contractor must take reasonable precautions to prevent the pollution of the ground and water resources on and adjacent to the site because of construction activities.</li> </ul>	<ul style="list-style-type: none"> <li>Observation</li> <li>Design Plans</li> </ul>	<ul style="list-style-type: none"> <li>Contractor</li> <li>ECO</li> </ul>	Continuous through the construction phase.

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
	protected and incur minimal negative impact from the development.		<ul style="list-style-type: none"> <li>No natural watercourse is to be used for the cleaning of tools or any other apparatus. This includes for purposes of bathing, or the washing of clothes etc.</li> <li>No spills may be washed down into a storm water drain or sewer, or into the surrounding natural environment.</li> <li>Abstraction of water from the nearby river must be prohibited unless approval has been given by DWS.</li> <li>Erosion control on temporary access roads must be undertaken.</li> <li>Any physical damage to any aspect of a watercourse must be avoided.</li> </ul>			

**8.2.6. Storm Water Management**

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Contamination of the nearby river or stream that will lead to the deterioration of water quality.</li> <li>Siltation in the nearby stream or river.</li> </ul>	<ul style="list-style-type: none"> <li>To ensure proper management of stormwater run-off that causes erosion and siltation/sedimentation.</li> <li>To ensure that the quality of water is protected.</li> </ul>	NWA (36 of 1998)	<ul style="list-style-type: none"> <li>Runoff from the cement/ concrete batching areas must be strictly controlled, and contaminated water must be collected, stored and either treated or disposed of off-site, at a location approved by the project manager.</li> <li>The Contractor must ensure that rainwater containing pollutants does not run-off into natural areas and thus result in a pollution threat.</li> <li>Stormwater shall be diverted from the construction works.</li> <li>Increased runoff due to vegetation clearance and/or soil compaction must be managed, and steps must be taken to</li> </ul>	<ul style="list-style-type: none"> <li>Site Plan</li> <li>Observation</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> <li>Contractor</li> <li>CEO</li> </ul>	Continuous during the construction

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<p>ensure that storm water does not lead to excessive levels of silt entering the watercourses.</p> <ul style="list-style-type: none"> <li>• Effort shall be made to ensure that stormwater leaving the construction site is not contaminated by any substance, whether solid, liquid or gas.</li> <li>• Erosion control measures must be put in place to control stormwater runoff.</li> </ul>			

**8.2.7. Top Soil Management and Erosion Control**

Possible Impact	Objective	Applicable Legislation /Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>• Impact on soils and habitats and sensitive environs.</li> <li>• Compaction of soil.</li> </ul>	To prevent erosion and sedimentation.	NWA (36 OF 1998)	<p>To prevent any form of erosion the following must be adhered to:</p> <ul style="list-style-type: none"> <li>• During construction, the Contractor will protect areas susceptible to erosion by installing necessary temporary and / or permanent drainage works as soon as possible and by taking suitable measures to prevent surface water concentration into nearby roadways.</li> <li>• Prior to construction, all topsoil must be stripped and stockpiled separately from subsoil and rocky material. Soil must be stripped in a phased manner to retain vegetation cover for as long as possible.</li> <li>• Stockpiled topsoil should not be compacted and should be replaced as the final soil layer.</li> </ul>	<ul style="list-style-type: none"> <li>• Observation</li> <li>• Complaints register</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor</li> <li>• ECO</li> <li>• CEO</li> </ul>	On-going particularly during excavations

Possible Impact	Objective	Applicable Legislation /Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<ul style="list-style-type: none"> <li>• Stockpiled soil must be protected by erosion-control berms if exposed for a period of greater than 14 days during the wet season.</li> <li>• Topsoil stockpiles must not be contaminated with hydrocarbons, waste, or any other foreign matter, which may inhibit the later growth of vegetation and micro-organisms in the soil.</li> <li>• Soil must not be stockpiled on drainage lines or near watercourses.</li> <li>• Soil must be exposed for the minimum time possible once cleared of invasive vegetation.</li> <li>• If topsoil stockpile is stored for a longer period, it must be either vegetated with indigenous grasses or covered with a suitable material to prevent erosion and invasion by weeds.</li> <li>• To limit the introduction of alien species into the area, no soil may be imported onto site.</li> <li>• Where required, cut-off trenches can be installed to divert substantial run-off and prevent erosion as and when necessary.</li> <li>• Sensitive areas such as watercourses (riparian areas) should be cordoned off so that vehicles and construction personnel cannot gain access to these areas.</li> <li>• Where access into sensitive areas cannot be avoided, the number of vehicle and personnel traffic should be kept to a minimum and make use of only one route.</li> </ul>			

### 8.2.8. Waste Management

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>• Visual Impact</li> <li>• Contamination of the nearby water resources.</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure the effective and efficient separation, storage, and removal of waste from the site.</li> <li>• To ensure the efficient management of waste on site</li> <li>• To ensure minimal impact on the surrounding environment</li> </ul>	<p>NWA (36 of 1998). NEM:WA (59 of 2008)</p>	<ul style="list-style-type: none"> <li>• A Waste management Plan/ Method statement should be submitted before site camp establishment.</li> <li>• Waste management must form part of the induction process to ensure all workers on site have a full understanding of all proper waste management practices.</li> </ul> <p><b>Solid Waste Management</b></p> <ul style="list-style-type: none"> <li>• The Contractor must maintain 'good housekeeping' practices and ensure that all work sites and construction camp are kept tidy and litter free. No solid waste must be disposed of on site.</li> <li>• Waste shall be separated at source (e.g., Bins for glass, paper, metals, plastic, organic waste, and hazardous waste).</li> <li>• No waste materials shall at any stage be disposed of in the open veld, adjacent properties or in sensitive areas.</li> <li>• All solid waste including excess spoil (soil, rock, rubble etc) must be removed to a permitted waste disposal site on a weekly basis.</li> <li>• All waste must be transported in an appropriate manner (e.g., plastic rubbish bags) and disposed of at a registered waste disposal site. Proof of safe disposal must be kept on site.</li> </ul>	<ul style="list-style-type: none"> <li>• Intermittent Observation</li> <li>• Waste Disposal Records</li> </ul>	<ul style="list-style-type: none"> <li>• ECO</li> <li>• Contractor</li> <li>• CEO</li> </ul>	Daily



**8.2.9. Water Usage**

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
Overutilization of water resources	<ul style="list-style-type: none"> <li>To ensure availability of water for various uses as and when required.</li> <li>To ensure that water usage is minimised.</li> <li>To ensure that water resources are conserved.</li> <li>To encourage a 3R (Reduce, Reuse, Recycle).</li> </ul>	<ul style="list-style-type: none"> <li>NWA (36 of 1998)</li> </ul>	<ul style="list-style-type: none"> <li>The ECO shall indicate to the Contractors where they can obtain water for construction, water for dust suppression as well as for drinking.</li> <li>Contractors shall not make use of/collect water from any other source than those allocated to them as suitable for use.</li> <li>Ensure water conservation is being practiced by all construction personnel.</li> <li>Minimizing water use during the cleaning of equipment.</li> <li>Undertaking regular audits of water systems.</li> <li>Regular toolbox talks on water usage and conservation during environmental awareness training.</li> </ul>	Water use records	<ul style="list-style-type: none"> <li>ECO</li> <li>Contractor</li> </ul>	On-going during the construction phase

**8.2.10. Hazardous Substances, Materials Use, and Storage**

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Impact on human health.</li> <li>Impact on soils and water resources.</li> </ul>	<ul style="list-style-type: none"> <li>To ensure safe handling, storage, use, and disposal of hazardous substances.</li> <li>To ensure full compliance with the requirements of the applicable legislation.</li> </ul>	<ul style="list-style-type: none"> <li>OHSA (85 of 1993)</li> <li>Construction Regulations (2013).</li> </ul>	<p><b>Safety and Training</b></p> <ul style="list-style-type: none"> <li>The Contractor must train and educate all personnel on site regarding the proper use, handling, and disposal of hazardous material.</li> <li>All the necessary handling and safety equipment required to be used and worn by the staff or the safe use of hydrocarbons must be provided.</li> <li>Suitably qualified safety officers must undertake regular safety checks and maintenance of the storage tanks.</li> </ul>	<ul style="list-style-type: none"> <li>Hazardous material data sheet</li> <li>Incident report</li> <li>Observation of spillages and leakages</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> <li>Contractor</li> <li>CEO</li> </ul>	Continuous throughout the construction phase

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<ul style="list-style-type: none"> <li>• Joburg Water must comply with the Occupational Health and Safety Act, 1993 (Act 85 of 1993) and Construction Regulations (2003).</li> </ul> <p><b>Hazardous Material Storage:</b></p> <ul style="list-style-type: none"> <li>• The Contractor must comply with all National, Regional and Local legislation regarding the storage, transport, use and disposal of petroleum, chemical, harmful, and hazardous substances, and materials.</li> <li>• Hydrocarbons and other hazardous substances must only be stored in a secured, designated area with restricted entry.</li> <li>• All hydrocarbons, irrespective of volumes, must be stored on a smooth, impermeable surface or containments. The impermeable containment shall be 110% of total capacity of all the storage tanks.</li> <li>• All hazardous containers must be marked to indicate contents, quantities, and safety requirements.</li> <li>• Storage of hazardous products must be stored in suitable containers. Safety Data Sheets (SDS) of the hazardous material stored must always be available on—site and in the safety files.</li> <li>• Gas welding cylinders and LPG cylinders must be stored in a secure, well-ventilated area. The Contractor must supply sufficient fire-fighting equipment in the event of an incident.</li> <li>• Where fuel is stored and used, smoking must be prohibited.</li> <li>• Hazard signs must be installed at fuel and hazardous material storage area indicating the nature of the stored chemical.</li> </ul>			

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<p><b>Oil Spillage Management</b></p> <ul style="list-style-type: none"> <li>• The oil spill clean-up and rehabilitation standard must be developed and implemented accordingly.</li> <li>• Equipped spill kits must always be made available on site.</li> <li>• All spilled hazardous substances must be contained in impermeable containers for removal to a licensed hazardous waste site. All spills must be reported to the ECO within 24 hours.</li> <li>• If any chemicals spills in the nearby water resources, such incident must be immediately reported to DWS and Joburg Water. An action plan for rectification must be developed.</li> <li>• Exercise extreme care with the handling of diesel and other toxic solvents to ensure that spillage is avoided.</li> <li>• The management of chemicals and hydrocarbons must form part of the emergency preparedness and response program. No activities associated with hydrocarbons and or chemicals (i.e., wash bays etc.) may be undertaken outside of an effectively designed contained area.</li> <li>• In addition, the storage tanks, and any other areas where spillages and leakages could occur must be contained within a bunded area.</li> <li>• All construction materials liable to spillage must be stored in appropriate structures with impermeable flooring.</li> </ul>			

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<ul style="list-style-type: none"> <li>• Drip trays must be provided under vehicles and equipment, to contain spills of hazardous materials such as fuel, oil, and cement.</li> <li>• Repair and storage of vehicles must be conducted only within the demarcated site area.</li> <li>• Fuels, oils, hydraulic fluids, etc. must be confined to specific secured areas within the site camp to minimize accidental spillage.</li> <li>• No leaking vehicle shall be allowed on site.</li> </ul> <p><b>Contaminated Soil Disposal:</b></p> <ul style="list-style-type: none"> <li>• The contaminated waste shall be disposed of at a hazardous waste disposal site.</li> </ul>			

**8.2.11. Movement Of Construction Personnel and Equipment**

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>• Damage to protected/important vegetation.</li> <li>• Damage to sensitive areas.</li> <li>• Erosion and loss of topsoil.</li> </ul>	<ul style="list-style-type: none"> <li>• To prevent ecological damage.</li> <li>• Minimise damage to the identified watercourses.</li> <li>• Minimise erosion of embankments and subsequent siltation of watercourses.</li> </ul>	<ul style="list-style-type: none"> <li>• CARA (43 of 1983).</li> <li>• NEM: BA (10 of 2004).</li> </ul>	<p><b>Vehicular Access</b></p> <ul style="list-style-type: none"> <li>• A physical access plan along the servitude shall be compiled by the Contractor and approved by the ECO. The Contractor shall always adhere to this plan to ensure access to the sites.</li> <li>• No illegal use of private roads during construction due to damage anticipated because of heavy vehicles and equipment.</li> <li>• Upon completion of the project all roads shall be repaired to their original state.</li> <li>• No roads shall be cut through river- and stream banks as this may lead to erosion causing siltation of streams. Soil</li> </ul>	<ul style="list-style-type: none"> <li>• Observation</li> <li>• Site plan.</li> <li>• Regular monitoring of access roads conditions</li> <li>• Monitoring of impacts into the surrounding areas</li> </ul>	<ul style="list-style-type: none"> <li>• ECO</li> <li>• Contractor</li> <li>• CEO</li> <li>•</li> </ul>	Continuous during the construction phase

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			stabilisation measures should be implemented especially on steep slopes. • Rehabilitation of disturbed areas immediately following construction.			
<ul style="list-style-type: none"> <li>• Impact on sensitive environment</li> <li>• Trespassing</li> <li>• Safety and security.</li> </ul>	<ul style="list-style-type: none"> <li>• To ensure controlled and manageable movement of personnel and equipment.</li> </ul>	<ul style="list-style-type: none"> <li>• CARA (43 of 1983).</li> <li>• NEM: BA (10 of 2004).</li> <li>• NEMA (107 of 1998)</li> </ul>	<p><b><i>Movement of Construction Plant, Equipment and Personnel</i></b></p> <ul style="list-style-type: none"> <li>• All structures comprising the construction camp are to be removed from site after completion of construction.</li> <li>• Ensure that access to the site, including related infrastructure and machinery is restricted to authorised personnel only.</li> <li>• No construction staff must be permitted to trespass on private land or the adjacent properties/estates without permission.</li> <li>• The Contractor must ensure that all construction personnel, labourers, and equipment always remain within the demarcated construction sites.</li> <li>• The Contractor is to ensure that no machinery, personnel, material, or equipment enters 'No-Go' areas during construction.</li> <li>• The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint, etc, and these shall be cleaned up immediately.</li> <li>• All hardened surfaces within the construction camp area should be ripped, all imported materials removed, and the area shall be top soiled.</li> <li>• All the required safety labelling on the containers and trucks used shall be in place.</li> </ul>	<ul style="list-style-type: none"> <li>• Observation</li> <li>• Security registers.</li> <li>• Complaints register</li> </ul>	<ul style="list-style-type: none"> <li>• ECO</li> <li>• Contractor</li> </ul>	Continuous throughout the construction phase.

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<ul style="list-style-type: none"> <li>The Contractor shall ensure that all the necessary precautions against damage to the environment and injury to persons are taken. In the event of an accident, the Contractor shall supply a method statement to that effect.</li> </ul>			

**8.2.12. Servicing and Re-Fuelling of Construction Equipment**

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
Impact on soil and water resources due to accidental spillages of hazardous material i.e., oil, fuels, cement etc.	<ul style="list-style-type: none"> <li>To conserve soils, surface, and ground water.</li> <li>To prevent spillages of hazardous substances</li> </ul>	<ul style="list-style-type: none"> <li>NEM: WA (59 of 2008)</li> <li>NWA (36 of 1998)</li> <li>OHSA (85 of 193)</li> </ul>	<ul style="list-style-type: none"> <li>A Method Statement for the servicing and re-fuelling of construction plant should be submitted before construction commences.</li> <li>Vehicles used during the construction phase must be parked in a designated area and drip trays must be placed underneath the vehicles to prevent any oil leaks from seeping into the soil.</li> <li>All maintenance and repair work must be carried out within a designated area, equipped with necessary pollution containment measures.</li> <li>Spills in bunded areas must be cleaned up with a spill kit, and thereafter be disposed at a registered landfill site, such as Chloorkop Landfill.</li> <li>Refuelling, greasing, or oiling of vehicle and construction machinery must be done on a drip tray or bunded surface.</li> <li>Construction vehicles must be maintained in an acceptable state of repair. No vehicles or equipment with</li> </ul>	<ul style="list-style-type: none"> <li>Observation</li> <li>On-going monitoring</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> <li>Contractor</li> <li>CEO</li> </ul>	On-going during the construction phase



Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			leaks must be permitted to operate at any of the construction sites. <ul style="list-style-type: none"> <li>All leaking equipment's must be repaired immediately offsite and emergency repairs must be conducted on protected ground.</li> <li>Fuels required during construction must be stored in a central depot at the construction camp.</li> <li>Appropriate run-off containment measures must be put in place.</li> </ul>			

**8.2.13. Use of Cement and Concrete**

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
Soil pollution.	<ul style="list-style-type: none"> <li>To conserve soils, surface, and groundwater.</li> <li>To minimise waste concrete from polluting the environment</li> </ul>	<ul style="list-style-type: none"> <li>NEMA (107 of 1998)</li> <li>NEM: WA (59 of 2003)</li> <li>HSA</li> </ul>	The Contractor is advised that cement and concrete are regarded as highly hazardous to the natural environment due to their high pH and the chemicals contained therein. To avoid ground pollution the following must be adhered to: <ul style="list-style-type: none"> <li>Pre-mix concrete shall be the preferred option where possible.</li> <li>The batching / mixing area must be properly designated and indicated on the site plan and be always kept neat and clean.</li> <li>The no batching / mixing of cement must strictly be done on an impermeable surface.</li> <li>All runoff from batching shall be strictly controlled.</li> </ul>	<ul style="list-style-type: none"> <li>Observation</li> <li>Site Plan</li> </ul>	<ul style="list-style-type: none"> <li>Contractor</li> <li>ECO</li> <li>CEO</li> </ul>	Throughout the construction phase

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<ul style="list-style-type: none"> <li>The visible remains of the batch plant and concrete, either solid, or from washings shall be physically removed immediately and disposed of appropriately at a registered landfill site, such as Chlookop Landfill.</li> </ul>			

**8.2.14. Fire**

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Destruction of property</li> <li>Loss of life</li> </ul>	<ul style="list-style-type: none"> <li>To prevent open fires.</li> <li>To ensure that the employees are aware of emergency procedures should an incident occur.</li> </ul>	<ul style="list-style-type: none"> <li>NEMA (107 of 1998)</li> <li>OHSA 85 of 1993)</li> </ul>	<ul style="list-style-type: none"> <li>No fires should be permitted on site.</li> <li>All the necessary precautions to ensure that fires are not started because of activities on site must be put in place.</li> <li>Gas and liquid fuels may not be stored in the same storage area.</li> <li>All fire control mechanisms (firefighting equipment) will be routinely inspected. Such mechanisms will be always present and accessible.</li> <li>No open fires for heating or cooking will be permitted on site, unless otherwise agreed and then only on designated areas.</li> <li>All staff on site must be made aware of general fire prevention and control methods and the name of the responsible person to report fire incidents to.</li> <li>Designated smoking areas should be provided, with special bins for discarding of cigarette stump.</li> <li>Fire must be reported immediately.</li> <li>Emergency contact details must be available on site, where applicable.</li> </ul>	<ul style="list-style-type: none"> <li>Fire Management Plan</li> <li>Daily checks</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> <li>Contractor</li> <li>CEO</li> </ul>	On-going during the construction phase

**8.2.15. Air Pollution**

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
Dust nuisance from construction activities.	<ul style="list-style-type: none"> <li>To ensure proper mitigation of air pollution.</li> <li>To avoid dust nuisance from excavation activities and vehicles on dirt roads</li> </ul>	<ul style="list-style-type: none"> <li>NEM: AQ (39 of 2004)</li> <li>National Dust Control Regulations.</li> </ul>	<ul style="list-style-type: none"> <li>Dust pollution could occur during the construction, more so in the dry season. Therefore, regular, and effective dust suppression must be carried out to avoid dust pollution, impacting adjacent residential areas and creating dangerous driving conditions on nearby roads.</li> <li>When necessary, appropriate working areas should be damped down in the mornings and afternoons, by sprinkling bare areas with water, chemical soil binders, etc.</li> <li>Dust nets must be used where the construction site borders the Residential Area</li> <li>Unnecessary removal of vegetation must be avoided, unless permitted for pipeline construction.</li> <li>No burning of vegetation from clearing operations is allowed.</li> <li>Speed limit within the access roads and residential areas affected by construction of pipeline must be limited to 40km/hr .</li> </ul>	<ul style="list-style-type: none"> <li>Observation</li> <li>Complaints register</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> <li>CEO</li> </ul>	Monitored daily throughout the construction phase

**8.2.16. Noise Impact**

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
Noise during excavation/drilling of foundations and	<ul style="list-style-type: none"> <li>To ensure minimal noise disturbance.</li> </ul>	<ul style="list-style-type: none"> <li>Noise Control Regulations (ECA)</li> <li>SANS 10103 of 2008</li> </ul>	<ul style="list-style-type: none"> <li>Noise activities shall only take place during working hours (09:00 to 17:30).</li> <li>Site workers must comply with the Municipal noise requirements as outlined.</li> </ul>	A register of complaints to be always kept on	<ul style="list-style-type: none"> <li>ECO</li> <li>CEO</li> </ul>	On-going during the construction phase

associated construction activities	<ul style="list-style-type: none"> <li>To avoid noise nuisance from operating construction equipment.</li> </ul>		<ul style="list-style-type: none"> <li>Machinery and vehicles are to be maintained in good working order.</li> <li>Where possible the Contractor must use equipment which falls within the allowable noise limits (45 dBA).</li> <li>Any complaints pertaining to noise must be recorded and reported to the ECO and addressed accordingly.</li> <li>Employees to be provided with hearing protection as and when required.</li> </ul>	site and kept up to date.		
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**8.2.17. Visual Impact**

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
Negatively impacting the visual quality because of construction machinery.	<ul style="list-style-type: none"> <li>To ensure proper mitigation measures of potential visual impacts.</li> <li>To maintain the site's aesthetics.</li> </ul>	<ul style="list-style-type: none"> <li>NEMA (107 of 1998)</li> </ul>	<ul style="list-style-type: none"> <li>Storage facilities and other temporary structures on site must be in a manner that they have as little visual impact on residents as possible.</li> <li>Screen the construction site and lay down yards by enclosing the entire area with a dark green or black shade cloth on less than 2m height.</li> <li>All temporary structures placed on site for the project's construction phase must be removed upon completion of the project.</li> <li>Lighting must be sufficient to ensure security but will not constitute 'light pollution' to the surrounding areas.</li> </ul>	<ul style="list-style-type: none"> <li>A register of complaints to be always kept on site and kept up to date.</li> <li>Inspection</li> </ul>	<ul style="list-style-type: none"> <li>Contractor</li> <li>ECO</li> <li>CEO</li> </ul>	On-going during the construction phase

**8.2.18. Social Impact**

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
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<ul style="list-style-type: none"> <li>• Influx of jobseekers into the area where they see construction activities.</li> <li>• Inflow of Temporary workers.</li> </ul>	<ul style="list-style-type: none"> <li>• To promote local employment.</li> </ul>		<ul style="list-style-type: none"> <li>• Encourage the Contractor to increase the local procurement practices and promote the employment of people from local communities, as far as feasible, to maximise the benefits to the local economies.</li> <li>• Engage with local authorities and business organisations to investigate the possibility of procuring construction materials, goods, and products from local suppliers where feasible.</li> <li>• Sub-contract to local construction companies particularly SMME's and BBBEE compliant and women-owned enterprises where possible.</li> <li>• Use local suppliers where feasible and arrange with the local SMME's to provide transport, catering, and other services to the construction crews.</li> <li>• Where possible, local labour should be considered for employment to increase the positive impact on the local economy.</li> <li>• If possible, set up a recruitment office in Midrand and adhere to strict labour recruitment practices that would reduce the desire of potential job seekers to loiter around the properties in the hope of finding temporary employment.</li> <li>• Control the movement of workers between the site and areas of residence to minimise loitering around the site. This should be done through the provision of scheduled transportation services between the construction site and area of residence.</li> <li>• Establish a management forum comprising key stakeholders to monitor and identify potential problems that may arise due to the influx of job seekers to the area.</li> </ul>	<p>HR Records</p>	<ul style="list-style-type: none"> <li>• Project Manager</li> </ul>	<p>On-going during the construction phase</p>
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			<ul style="list-style-type: none"> <li>• Assign a community liaison officer to deal with complaints and concerns of affected parties.</li> <li>• Provide adequate signage along relevant road networks to warn the motorists of the construction activities taking place on the site.</li> <li>• Engage with local authorities and inform them of the development as well as discuss with them their ability to meet the additional demands on social and basic services created by the in migration of workers.</li> </ul>			
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**8.2.19. Traffic Impact**

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>• Accidents.</li> <li>• Impact on road safety, congestion, wear, and tear of the road surface.</li> </ul>	<ul style="list-style-type: none"> <li>• To maximise road safety and minimise congestion.</li> <li>• To ensure that traffic impacts because of the construction-related activities are minimised.</li> </ul>	NLTA (5 of 2009)	<ul style="list-style-type: none"> <li>• Effective traffic control must take place throughout the construction phase.</li> <li>• The Contractor must maintain access roads. Furthermore, access roads to the site must be of suitable quality to eliminate soil erosion and channel stormwater. Where possible strategic positioning of entry and exit points must be established to ensure as negligible impact/ effect as possible on the traffic flow.</li> <li>• Clear traffic signs and signals should be installed on-site to provide for safe traffic movement.</li> <li>• Monitor adherence to traffic regulations.</li> <li>• Monitor drivers for use of alcohol and other substances that could impair judgment and driving.</li> <li>• Ensure that loads on trucks are properly secured during transport.</li> </ul>	<ul style="list-style-type: none"> <li>• A register of complaints to be always kept on site and kept up to date.</li> <li>• Inspection</li> </ul>	<ul style="list-style-type: none"> <li>• ECO</li> <li>• CEO</li> </ul>	On-going during the construction phase



			<ul style="list-style-type: none"> <li>• Schedule arrival and departure of heavy vehicles to avoid morning and afternoon peak hours.</li> <li>• Speed limit within the construction area should be limited to &lt;40km/hour.</li> </ul>			
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**8.2.20. Excavation, Backfilling and Trenching**

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>• Removal of topsoil</li> <li>• Possible erosion</li> <li>• Accidents caused by excavated areas.</li> </ul>	<ul style="list-style-type: none"> <li>• To prevent erosion.</li> <li>• To ensure safety for both human and animals.</li> </ul>	<ul style="list-style-type: none"> <li>• OHS Act (85 of 1993)</li> <li>• NEMA (107 OF 1998)</li> </ul>	<p>While working at areas prone to erosion the following must be adhered to:</p> <ul style="list-style-type: none"> <li>• Excavations must not be left open for longer than 30 days where at all possible.</li> <li>• Time works to reduce excavation work occurring during precipitation events/seasons.</li> <li>• Excavations must be always barricaded/ fenced off by a danger tape to keep people out.</li> <li>• Proper site staging to ensure that the maximum amount of existing vegetation is left in place during the excavation phase.</li> <li>• Leave a continuous buffer of vegetation around the site perimeter to intercept any sediment that might be transferred off site via surface water flow.</li> <li>• A qualified person should make daily inspections of excavations using the approved checklist prior to the start of the work shift.</li> <li>• No personnel should be permitted in the excavation or trench when power equipment is being used to perform the excavation.</li> </ul>	<ul style="list-style-type: none"> <li>• Observation</li> <li>• Incident report</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor</li> <li>• ECO</li> <li>• CEO</li> </ul>	On-going excavations

## 8.2.21. Site Clean-Up and Rehabilitation

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Erosion</li> <li>Use of non-indigenous species</li> </ul>	<ul style="list-style-type: none"> <li>Minimise damage to topsoil and environment at excavations.</li> <li>Successful rehabilitation of all damaged areas</li> <li>Prevention of erosion</li> <li>To ensure that the site is fully rehabilitated to its original state</li> <li>To ensure that the site is clean and neat.</li> <li>Minimize claims and litigation from landowners</li> </ul>	<ul style="list-style-type: none"> <li>NEM: BA (10 of 2004)</li> <li>NEMA (107 of 198)</li> </ul>	<ul style="list-style-type: none"> <li>All areas disturbed by construction activities must be subject to landscaping and rehabilitation.</li> <li>Rehabilitation of areas affected by construction activities should ideally commence at the start of the rainy season.</li> <li>Recommended rehabilitation is in the form of active re-vegetation of affected areas, including areas where surface disturbances resulted from construction, as well as areas that were used for alternative or other functions, such as storage areas, parking bays.</li> <li>Existing access road should be left 'as is' for future use during maintenance operations. All area of incomplete construction should be completed and prepared for final rehabilitation and re-vegetation.</li> <li>The Contractor must ensure that all temporary structures, materials, waste and facilities used for construction activities are removed upon completion of the project.</li> <li>All replaced equipment and excess gravel, stone, concrete, bricks, temporary and fencing must be removed from the site upon completion of the work.</li> <li>No discarded materials of any nature shall be buried on the site or on any other land within the site.</li> <li>Stockpiled topsoil must be used for rehabilitation.</li> <li>Stockpiled topsoil must be evenly spread to facilitate seeding and minimise loss of soil due to erosion.</li> </ul>	Rehabilitation Plan Observation	<ul style="list-style-type: none"> <li>ECO</li> <li>CEO</li> <li>Contractor</li> </ul>	<ul style="list-style-type: none"> <li>On completion of construction</li> <li>Random surveys by landowner</li> </ul>

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<ul style="list-style-type: none"> <li>The Contractor shall dispose of all excess material on site in an appropriate manner and at a designated place.</li> </ul>			

**8.2.22. Monitoring of EMPr Compliance**

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Non-compliance of the EMP</li> <li>Failed rehabilitation.</li> </ul>	<ul style="list-style-type: none"> <li>To implement an on-going monitoring and performance audit programme</li> <li>To ensure adequate reporting of progress with the development</li> <li>To ensure compliance with the requirements of the EMP.</li> <li>To ensure successful rehabilitation</li> </ul>	NEMA (107 of 198)	<ul style="list-style-type: none"> <li>Regular monitoring reports, monthly and close out must be compiled.</li> <li>Monitoring of the general implementation of/adherence to the EMPr shall be the responsibility of the ECO.</li> <li>Reporting on compliance to stipulations as communicated to contractors, shall take place during scheduled site meetings.</li> </ul>	<ul style="list-style-type: none"> <li>Observation</li> <li>Monthly audit Reports</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> <li>Contractor</li> <li>CEO</li> </ul>	On-going during the site establishment and construction phase.

**8.2.23. Document Control**

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
Lose track of time and funds for the proposed projects.	<ul style="list-style-type: none"> <li>To ensure compliance with the requirements of the regulatory authority</li> <li>To assign roles and responsibilities to ensure compliance</li> <li>To implement and comply with the requirements of the EMPr.</li> </ul>		<ul style="list-style-type: none"> <li>A copy of this EMPr and the EA must always be made available on site.</li> <li>The EMPr and the EA must be used as reference as the project progresses. These documents must be presented to the authorities at any given time that they might visit the site.</li> </ul>	Availability of an EMPR copy on site	<ul style="list-style-type: none"> <li>ECO</li> <li>Contractor</li> <li>CEO</li> </ul>	On-going during the construction phase.

## 9. ENVIRONMENTAL GENERIC CONDITIONS

To ensure compliance with Joburg Water's environmental policy as well as environmental legislation requirements, the following general conditions are applicable:

### 9.1. SITE DOCUMENTATION/MONITORING

The standard Joburg Water site documentation shall be used to keep records on-site. All documents shall be kept on site, and be available for monitoring, and auditing purposes. Site inspections by an Environmental Audit Team may require access to this documentation for auditing purposes. All parties shall sign the documentation to ensure that such documents are legitimate. Regular monitoring (At least monthly) of all work on site by the Environmental Control Officer is required to ensure that all problems encountered are solved punctually and amicably. The Joburg Water Environmental Officer must be on site daily to ensure implementation of the EMPr., the Joburg Water Construction Manager shall keep abreast of all works to ensure no problems arise. Monthly Environmental Monitoring reports shall be submitted to the appointed Joburg Water Environmental Officer by the CEO with all information relating to environmental matters.

The following Key Performance Indicators must be reported on a fortnightly basis:

- Complaints received from Landowners and actions taken.
- Environmental incidents, such as oil spills, concrete spills, etc., and actions taken (litigation excluded).
- Incidents leading to litigation and legal contraventions.
- Environmental damage that needs rehabilitation measures to be taken.
- The following documentation shall be kept on site:
  - Access negotiations and physical access plan.
  - Complaints register.
  - Site daily diary.
  - Records of all remediation/rehabilitation activities.
  - Copy of the EMPr.

The ECO shall further prepare monthly Environmental Monitoring reports which will cover the activities undertaken as well as the status of compliance on site. Copies of the monthly reports must be submitted to Joburg Water as well as GDARD. Furthermore, monthly reports must be kept on-site either as hard or soft copies.

### 9.2. AUDITS

Audits must be undertaken in accordance with the requirement of Appendix 7 of the EIA Regulations of December 2014 as amended. During the construction period, the ECO must conduct at least monthly Environmental Audits to determine compliance with the recommendations of the EMPr and conditions of the EA.

The appointed ECO, as well as the Contractors on site, are responsible for ensuring compliance with the EMPr. It is recommended that monthly EMPr compliance reports (audits) are compiled by the ECO and submitted to CEO for correction of non-compliances. It is the responsibility of the ECO to report any non-compliance, which is not correctly rectified to the GDARD.

### **9.3. ACCESS TO DOCUMENTS**

Interested and Affected Parties must be allowed access to the EMPr document should they so wish. They have the right to monitor specific aspects of the EMPr in conjunction with the ECO and Contractor, reasonably and informally without unreasonably disrupting construction activities.

### **9.4. PROCESS FOR IDENTIFYING EMERGENCY PROCEDURES**

- A plan of action must be drawn up in the case of an emergency (veld fire, vegetation problems, etc.)
- Adjacent property owners or occupiers must be always treated with respect and courtesy.
- The culture and lifestyles of the communities living nearby the proposed development must be respected.
- Environmental clauses (as referred to in this Construction and Operation EMPr) must be included in the contract documents for all contractors; and
- A register of all complaints or queries received as well as action taken must be always kept on-site.

## **10. FAILURE TO COMPLY WITH THE ENVIRONMENTAL CONSIDERATIONS**

The ECO will, acting reasonably, have the authority to order the Contractor to suspend part or all the works if it causes unacceptable damage to the environment by not adhering to the specifications in the EMPr. The suspension will be enforced until the offending parties' actions, procedures, and/or equipment are corrected, and adequate mitigation measures implemented.

## **11. AMENDMENT OF EMPR**

Any issue that may arise during the construction or operational phase of the pipeline and is not provided for in this EMPr may be addressed as an amendment to this EMPr. An amendment must be submitted to Joburg Water for approval before the implementation of the provisions contained.