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**ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT (EMPr)**

**PROPOSED UPGRADE OF THE  
WATER PIPELINE NETWORK IN  
CARLSWALD, GAUTENG  
PROVINCE**

**Report No:** 20085-46-Rep-001-Carlswald EMPr-  
Rev0

**Submitted to:**

Gauteng Department of Agriculture and Rural  
Development  
56 Eloff St,  
Marshalltown,  
Johannesburg,  
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Associate Directors: J. Heera (Ms.), T. Kaponda, Dr. M. Vosloo



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## DOCUMENT CONTROL SHEET

**Project Title** : **Proposed upgrade of the water pipeline network in Carlswald, Gauteng Province**

**Project No** : **20085**

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### DOCUMENT APPROVAL

<b>ACTION</b>	<b>DESIGNATION</b>	<b>NAME</b>	<b>DATE</b>	<b>SIGNATURE</b>
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### RECORD OF REVISIONS

<b>Date</b>	<b>Revision</b>	<b>Author</b>	<b>Comments</b>

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**LIST OF ACRONYMS**

<b>Acronym</b>	<b>Description</b>
CA	Competent Authority
CBA	Critical Biodiversity Area
DEFF	Department of Environment, Forestry and Fisheries
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMM	Ekurhuleni Metropolitan Municipality
EMP	Environmental Management Programme
EMP	Environmental Management Plan
EO	Environmental Officer
ESA	Ecological Support Area
GDACE	Gauteng Department of Agriculture, Conservation, and Environment
GDARD	Gauteng Department of Agriculture and Rural Development
GIS	Geographic Information System
GP EMF	Gauteng Province Environmental Management Framework
NBA	National Biodiversity Assessment
NEMA	National Environmental Management Act 107 of 1998 (as amended)
NEMWA	National Environmental Management Waste Management Act 59 of 2008
NWA	National Water Act 36 of 1998
OHS	Occupational Health and Safety Act 85 of 1993
PM	Project Manager
PPP	Public Participation Process

## 1 DOCUMENT ROADMAP

This EMPr is aligned with Appendix 4 of the Environmental Impact Assessment Regulations, 2014 (EIA Regulations), as amended. The relevant document sections which address each of the aspects provided in Appendix 4 of the NEMA EIA Regulations 2014 (as amended) are provided in Table 1-1.

**Table 1-1: Document Roadmap**

Relevant regulation, stipulation, or condition		Relevant Document Part
<b>Appendix 4</b>		
1) An EMPr must comply with section 24N of the Act and include-		
(a)	details of -	
	(i) the EAP who prepared the EMPr; and	Section 2.4
	(ii) the expertise of that EAP to prepare an EMPr, including curriculum vitae;	Section 2.4 & Appendix B
(b)	a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Section 0
(c)	a map at an appropriate scale which 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 0
(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-	Section 7 & 8
	(i) Planning and design;	Section 7.1
	(ii) Pre-construction activities;	Section 7.2
	(iii) Construction activities	Section 7.3
	(iv) Rehabilitation of the environment after construction and where applicable post-closure; and	Section 7.4
	(v) Where relevant, operational activities	Section 7 & *
(e)	<i>(Item 1(1)(e) deleted by Government Notice 326 in Government Gazette 40772 dated 7 April 2017)</i>	N/A
(f)	a description of the proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable, include actions to-	Section 7 & 8
	(i) Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;	Section 7 & 8
	(ii) Comply with any prescribed environmental management standards or practices;	Section 2.6
	(iii) Comply with any applicable provisions of the Act regarding the closure, where applicable; and	Not applicable
	(iv) Comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;	Not applicable
(g)	the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 7 & 8
(h)	the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 7 & 8

Relevant regulation, stipulation, or condition		Relevant Document Part
(i)	an indication of the persons who will be responsible for the implementation of the impact management actions;	Section 7 & 8
(j)	the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Section 7 & 8
(k)	the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Section 7 & 8
(l)	a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	Section 7.8
(m)	an environmental awareness plan prescribing the manner in which-	
(i)	The applicant intends to inform his or her employees of any environmental risk which may result from their work; and	Section 9
(ii)	Risks must be dealt with in order to avoid pollution or the degradation of the environment; and	Section 9
(n)	any specific information that may be required by the competent authority	Not Applicable



## **2 BACKGROUND INFORMATION**

### **2.1 Introduction**

Johannesburg Water SOC Ltd (JW) has appointed Zitholele Consulting (Pty) Ltd to undertake an application for Environmental Authorisation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA,) and associated Environmental Impact Assessment Regulations of 2014 (GN R.982) and Listing Notices (GN R.983, GN R.984 and GN R.985) as amended.

### **2.2 Need and Desirability**

The Carlswald area is currently supplied with water from the Erand Reservoir which has a capacity of 27 hours x Average Annual Daily Demand (AADD) for the present, and 25 hours x AADD in the future. JW's Design Guidelines stipulate 36 hours x AADD as the design requirement, which means that the Erand Reservoir does not have the capacity to supply water for both the present and future scenarios.

The proposed development involves the construction of a new 20ML Carlswald Reservoir to service the surrounding areas and the upgrade of the water pipeline network upgrade. The project entails the installation of a new water pipeline with an approximate length of 5.1 kilometres.

The proposed development is intended to improve and ensure an uninterrupted supply of water in the areas that experience shortages due to new and future developments.

### 2.3 General objectives and purpose of the EMPr

The general objectives of the EMPr are to:

- Determine environmental conditions and sensitivities of the site and areas outside that may be impacted by the continued operation of the facility;
- Ensure environmental quality control and risk management during the operational phase of the development;
- Ensure effective management of stormwater from the development site;
- Ensure the licence holder and developer manage and operate their activities with due care and diligence;
- Avoid and/or limit any adverse impacts they may have on the environment by the activities undertaken in the facility;
- Control predicted impacts that may occur, so as to meet acceptable standards, both as a legal and moral responsibility to the environment within which they operate; and
- Ensure transparency in their operation and environmental management of the site.

This EMPr serves as a stand-alone document to be issued to, and used by JW (Applicant), contractor/s, sub-consultants and Project Managers (PMs) during the construction and operational phases of the facility. By its very nature, the EMPr is a dynamic document and updating may be required over the life of the development.

### 2.4 Details and expertise of Environmental Assessment Practitioner

Zitholele Consulting provide specialist consulting services in the fields of Water Engineering, Integrated Water Resource Management, Environmental and Waste Services, and Communication (public participation and awareness creation).

Zitholele Consulting has no vested interest in the development of the facility other than fair remuneration for services rendered, and hereby declares its independence as required by the EIA Regulations of 2014 (as amended).

**Table 2-1: Details of EAP who compiled the EMPr to support this BA process**

Name of EAP	Ms. Jessica Morwasehla (Environmental Consultant)
Professional registration	SACNASP Candidate (121840)
Company name	Zitholele Consulting (Pty) Ltd
Company Registration	2000/000392/07
Physical address	Building 1, Maxwell Office Park, Magwa Crescent West, Waterfall City, Midrand
Postal address	P.O. Box 6002, Halfway House, 1685
Telephone	011 207 2060
Fax	086 674 6121
Email Address	<a href="mailto:jessicam@zitholele.co.za">jessicam@zitholele.co.za</a>
Name of EAP	Natasha Lalie (Senior Environmental Scientist)
Professional registration	EAPASA: Reg. EAP. (Reg. No. 2021/3611)
Company name	Zitholele Consulting (Pty) Ltd
Company Registration	2000/000392/07

Physical address	Building 1, Maxwell Office Park, Magwa Crescent West, Waterfall City, Midrand
Postal address	P.O. Box 6002, Halfway House, 1685
Telephone	011 207 2060
Fax	086 674 6121
Email Address	<a href="mailto:natashal@zitholele.co.za">natashal@zitholele.co.za</a>

Refer to the CVs of the EAPs in Appendix B.

## 2.5 Details of project proponent

The details of the Project Proponent/Developer are provided in Table 2-2 below.

**Table 2-2: Proponent's details**

Name of Applicant	Ms Joyce Ngobele
Company	Johannesburg Water SOC Ltd
Company Registration	2000/029271/30
Physical address	
Telephone	011 688 1443
Fax	
E-mail	<a href="mailto:Joyce.ngobele@jwater.co.za">Joyce.ngobele@jwater.co.za</a>

## 2.6 Legal Context

### 2.6.1 Legislative Requirements for this EMPr

This EMPr is aligned as far as possible with Appendix 4 of the Environmental Impact Assessment Regulations, 2014 as amended (EIA Regulations).

### 2.6.2 Applicable Legislation

Environmental legislation in South Africa was promulgated with the aim of, at the very least, minimising and, at the most, preventing environmental degradation. The Acts and Regulations applicable to the operation of the pipeline and the construction of the pipeline within the proposed upgrade area, are summarised in Table 2-3.

The list below was compiled to ensure that the applicant is aware of their legal responsibilities and liabilities during the installation of the pipeline.

JW, and any agents or contractor's acting on its behalf, should note that obligations imposed by the EMPr are legally binding in terms of environmental statutory legislation, and in terms of the additional conditions to the general conditions of contract that pertain to this project. Non-compliance to the National Water Act, 1998 (Act No. 36 of 1998) and applicable environmental laws are a criminal offence and if prosecuted, JW will be liable for any environmental damage incurred.

**Table 2-3: List of Applicable Legislation**

Name of Act	Act No. and Year	Notes/remarks
The Constitution of the Republic of South Africa	108 of 1996	Includes the Bill of Rights, Environmental rights, Rights to property, administrative justice and Access to information, <i>inter alia</i> .
National Environmental Management Act	107 of 1998	List of activities and competent authorities identified in terms of Sections 24 and 24D. NEMA Environmental Impact Assessment (EIA) Regulations 2014 (GN R.982), as amended in April 2017 (published in Government Notice No. R.326).
National Environmental Management: Protected Areas Act	57 of 2003	Provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity, natural landscapes and seascapes.
National Environmental Management: Biodiversity Act	10 of 2004	Strategy for achieving the objectives of the United Nation's Convention on Biological Diversity, to which South Africa is a signatory.
National Heritage Resources Act (NHRA)	25 of 1999	The NHRA serves to introduce an integrated and interactive system for the identification, assessment and management of the heritage resources of South Africa. The NHRA promotes good governance and the empowerment of civil society to preserve their heritage for future generations and states the principles of heritage resource management while making provision for legislation protecting national heritage.
National Environmental Management: Air Quality Act	39 of 2004	Control of dust, noise and offensive odours.
Hazard Substances Act, and regulations	15 of 1973 of	Provides for the definition, classification, use, operation, modification, disposal or dumping of hazardous substances.
Conservation of Agricultural Resources Act (CARA)	43 of 1983	To provide for control over the utilisation of the natural agricultural resources of the Republic in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants; and for matters connected therewith.
The Promotion of Administrative Justice Act	3 of 2000	<ul style="list-style-type: none"> <li>• Definitions (Section 1);</li> <li>• Procedural Fairness (Section 3, 4 and 6);</li> <li>• Right to Reasons for Decisions (Section 5); and</li> <li>• Judicial Review (Section 6 and 8).</li> </ul>
Occupational Health and Safety Act	85 of 1993	Prescribes health and safety measures necessary to adhere to for all construction workers
Promotion of Access to Information Act	2 of 2000	Right of access to any information held by the State or by another person and that is required for the exercise or protection of any rights
National Water Act, and regulations	36 of 1998	Prevention of effects of pollution, control of emergency incidents, and water use and licensing.
National Building Regulations and Building Standards	103 of 1997	To promote the promotion of uniformity in the law relating to the erection of buildings in the areas of jurisdiction of local authorities for the prescribing of building standards and for matters connected therewith.
All other National and Provincial Legislation and any relevant Ordinance, Regulation, By-laws and relevant National Standards and Norms.		
All relevant Provincial and Municipal bylaws. The Johannesburg Metropolitan Municipality may have certain requirements in terms of bylaws and trade permits, and a few of these may be applicable to this project:		

Name of Act	Act No. and Year	Notes/remarks
<ul style="list-style-type: none"><li>• Water and Sanitation Bylaw</li><li>• Waste Management Bylaw</li><li>• Municipal Health Bylaw</li></ul>		
Provincial noise regulations as outlined in Provincial Notice No. 5479 of 1999: Gauteng Noise Control Regulations.		
Construction Regulations of 2003, which applies to any persons involved in construction work and are therefore applicable to the construction phase. The regulations provide guidelines for safe operation during construction.		
Hazardous Chemical Substance Regulations of 1995, which stipulates the requirements for storage and handling of hazardous chemical substances and provide guidelines for the training of staff.		

### 3 PROJECT DESCRIPTION

#### 3.1 Study Area

The proposed water pipeline upgrade is located in Carlswald, Midrand which falls under the jurisdiction of the City of Johannesburg Metropolitan Municipality in the Gauteng Province. There are three alternative pipeline routes that have been investigated, and these routes can be accessed from the following roads:

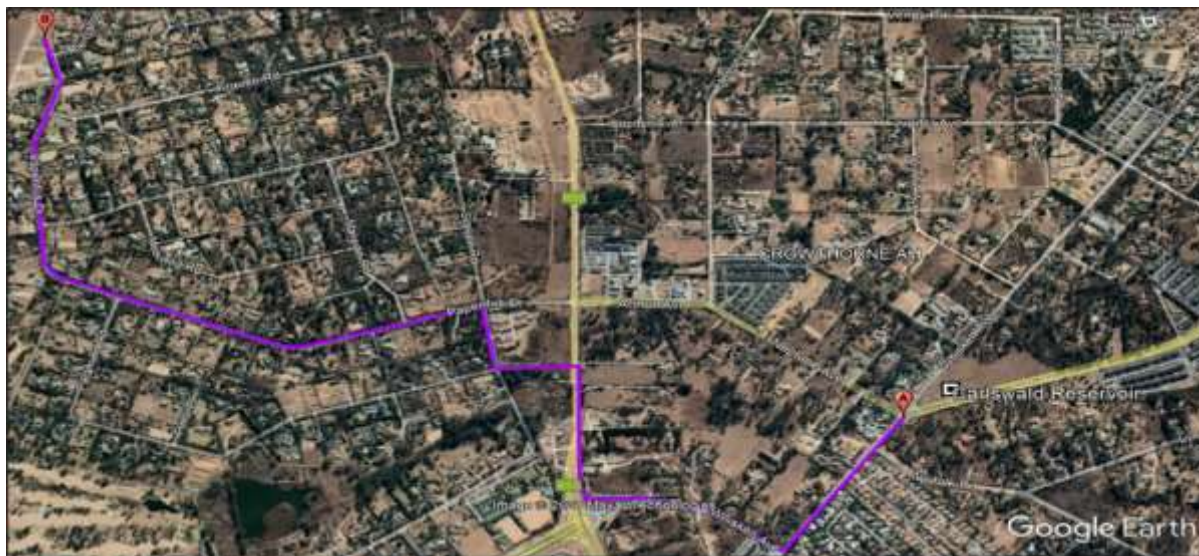
**Site Alternative 1** (refer to Figure 1): The pipeline route alignment starts from the Whisken and Neptune Avenue intersection (point A) and will be taken in a north westerly direction, where it encounters a 210° bend, before it proceeds into Arthur Avenue. It then continues in a westly direction where it crosses the R55 (Main Road). The pipeline route then continues onto Papenfus Drive alongside the road reserve where it passes through the Beaulieu Country Estate Guard House, and then enters through into road reserve of Papenfus Drive within the Estate. The pipeline route alignment then crosses the Papenfus Drive and Stallion Road intersection and proceeds alongside the Papenfus Drive road reserve for 2.13km to where it ends outside the Blue Hills Country Estate entrance (point B).



**Figure 1: Location of Site alternative 1**

**Site alternative 2** (refer to Figure 2): The pipeline route alignment starts at the Whisken and Neptune Avenue intersection (Point A) and will move in a south-westerly direction where it bends 90° on Whisken Avenue and continues towards a north-westerly direction on Whisken Avenue until it crosses the R55 (Main Road). The pipeline then continues in a northerly direction along the R55 road reserve for 0.48km where it turns 90° into a servitude entering Beaulieu Estate on Stallion Road. The pipeline crosses Stallion Road and bends by 90° where it continues in northerly direction towards Papenfus Drive. From

the Stallion Road and Papenfus Drive intersection, the pipeline proceeds alongside Papenfus Drive for 2.13 km where it ends outside the Blue Hills Country Estate entrance (Point B).



**Figure 2: Location of Site alternative 2**

**Site alternative 3** (refer to Figure 3): The pipeline route alignment starts at the Whisken and Neptune Avenue intersection (Point A) and moves in a north-easterly direction along Whisken Avenue. The pipeline route alignment then crosses Whisken Avenue, and continues until it reaches Pluto Road, where it turns 90° into Pluto Road. From there, the pipeline travels for 0.3 km where it makes a 126° bend, and continues north into Winne Avenue, until it reaches Jupiter Avenue. The pipeline turns in an easterly direction onto Jupiter Avenue, where it travels for 1km to where it reaches the R55 (Main Road). From the R55, the pipeline travels south, along the road for about 0.45km, where it turns 90° into a servitude entering Beaulieu Estate, on Stallion Road. The pipeline crosses Stallion Road and bends by 90° where it continues in southerly direction towards Papenfus Drive. From the Stallion Road and Papenfus Drive intersection, the pipeline proceeds alongside Papenfus Drive for 2.13 km where it ends outside the Blue Hills Country Estate entrance (Point B).



**Figure 3: Location of Site alternative 3**

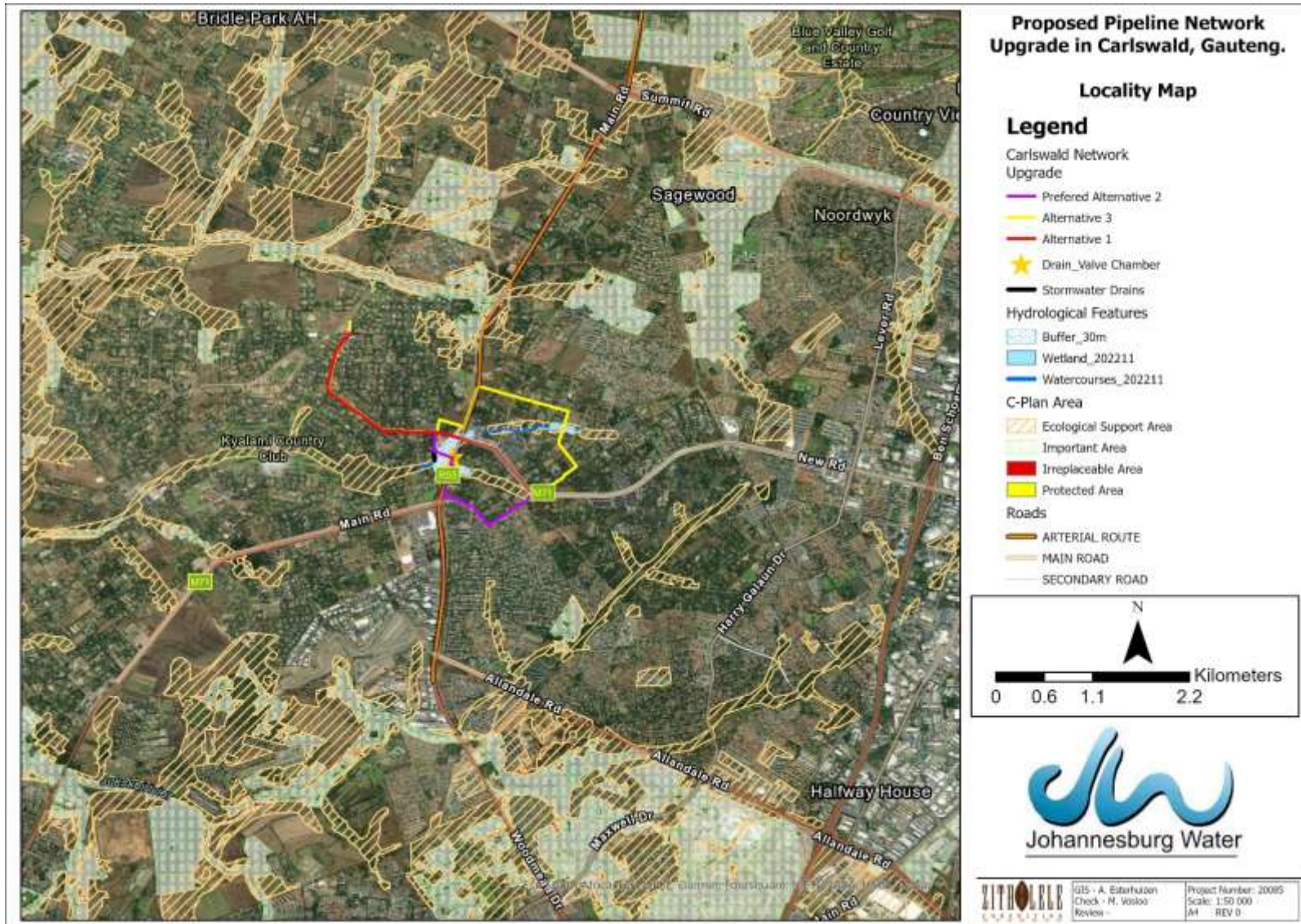


Figure 3-2: Locality Map  
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## **3.2 Proposed project components**

This EMPr has been developed to address the management of the impacts during the construction, operational and decommissioning phases of the project. The following components of the project site were taken into consideration during the development of the EMP:

- The lifespan of the site.
- Footprint of the facility (ground space).
- Proposed infrastructure.
- Sorting facility.
- Services.
- Developmental phases.

### **3.2.1 Lifespan of the facility**

The facility is designed for an indefinite lifespan.

### **3.2.2 Footprint of the facility**

The available footprints of the proposed alternative sites are indicated below:

- Pipeline Network 1: ~3.25 km
- Pipeline Network 2: ~4.11 km
- Pipeline Network 3: ~5.17 km

### **3.2.3 Proposed Infrastructure**

The site layout drawing indicating existing and proposed pipelines is provided in Figure 3-3, Figure 3-4 and Figure 3-5. A high-resolution A3 version of the site layout drawing is further included in Appendix C-1 to this Basic Assessment Report (BAR).

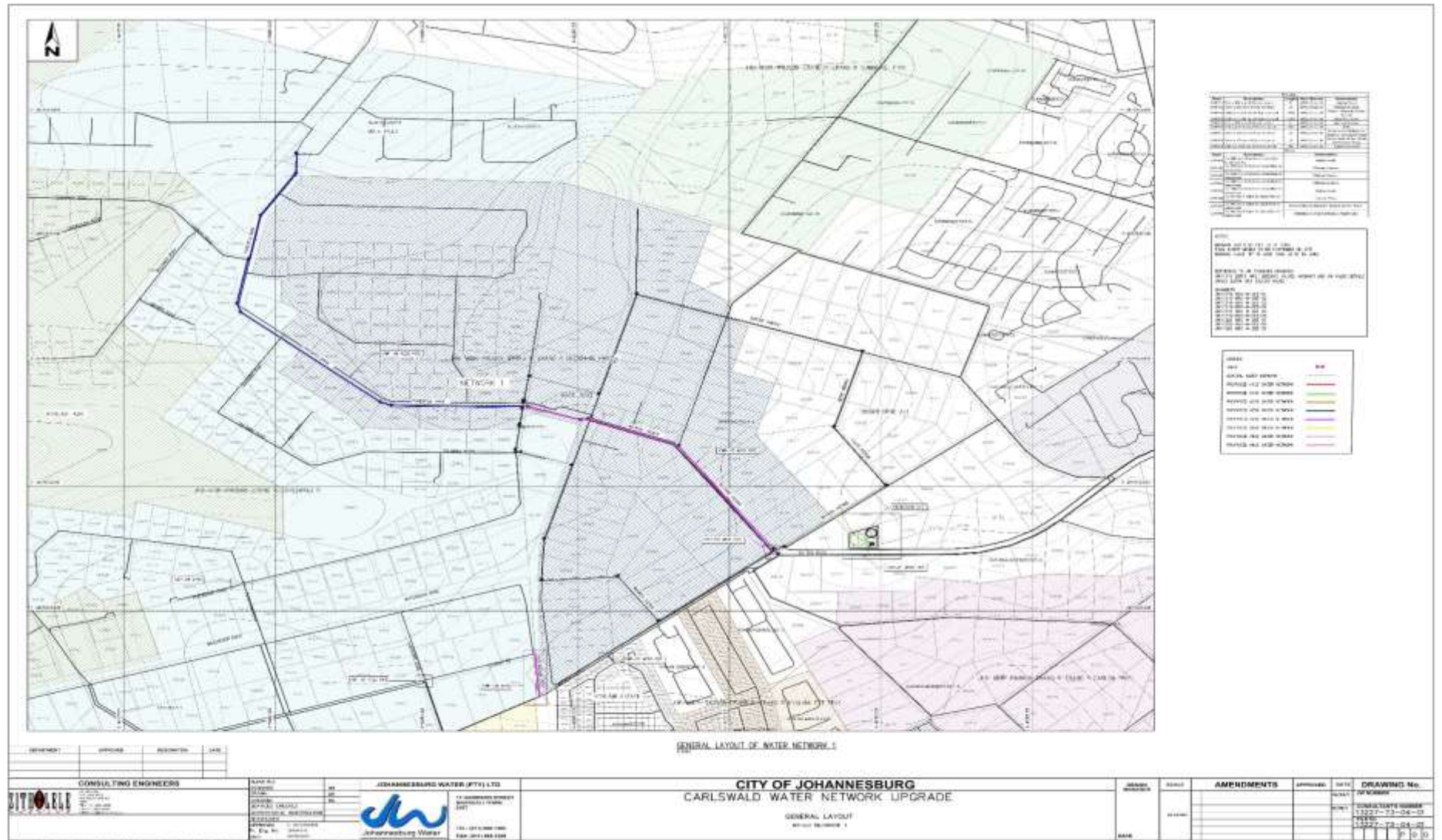


Figure 3-3: Site layout drawing for Pipeline Network 1

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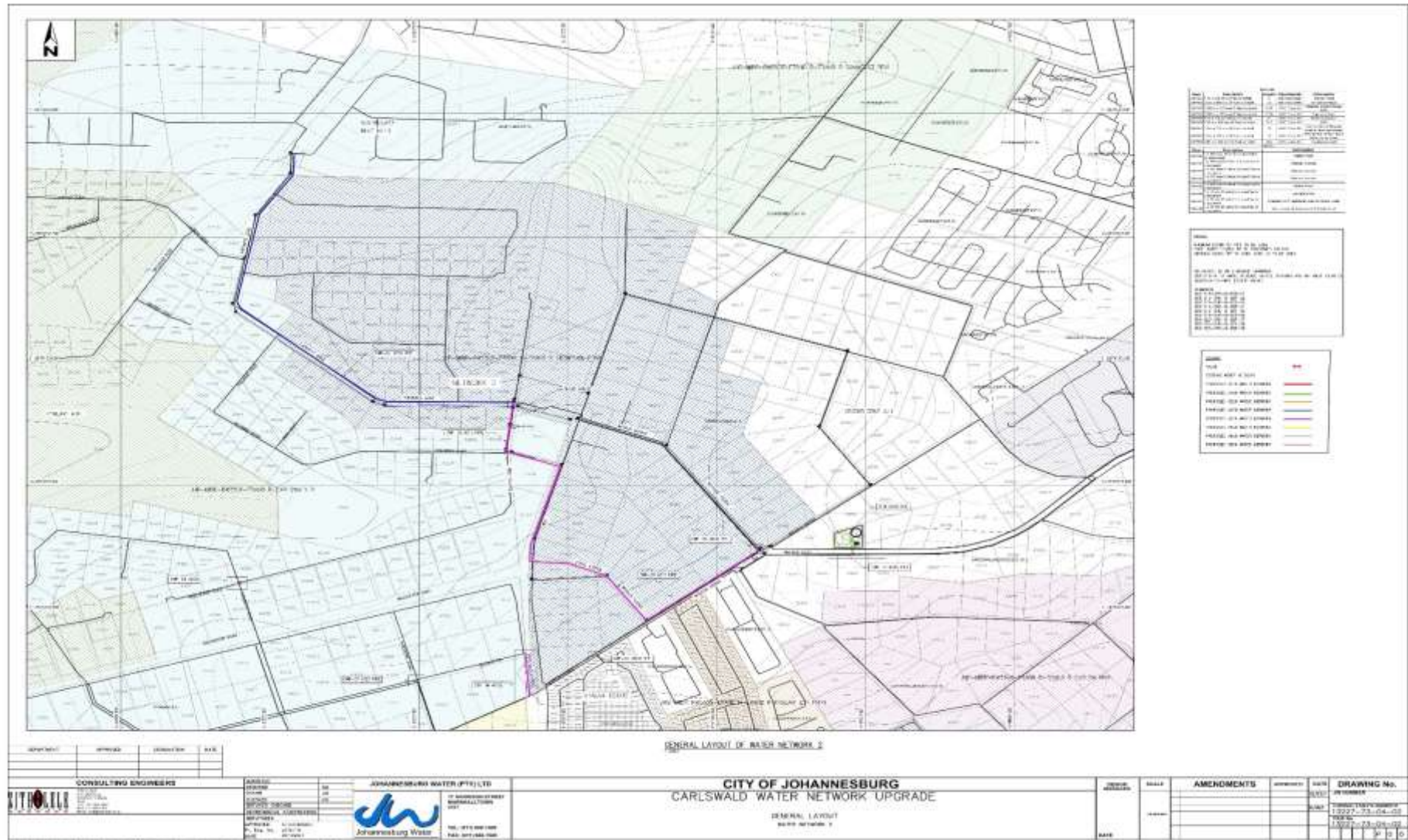


Figure 3-4: Site layout for pipeline Network 2

ZITHOLELE CONSULTING

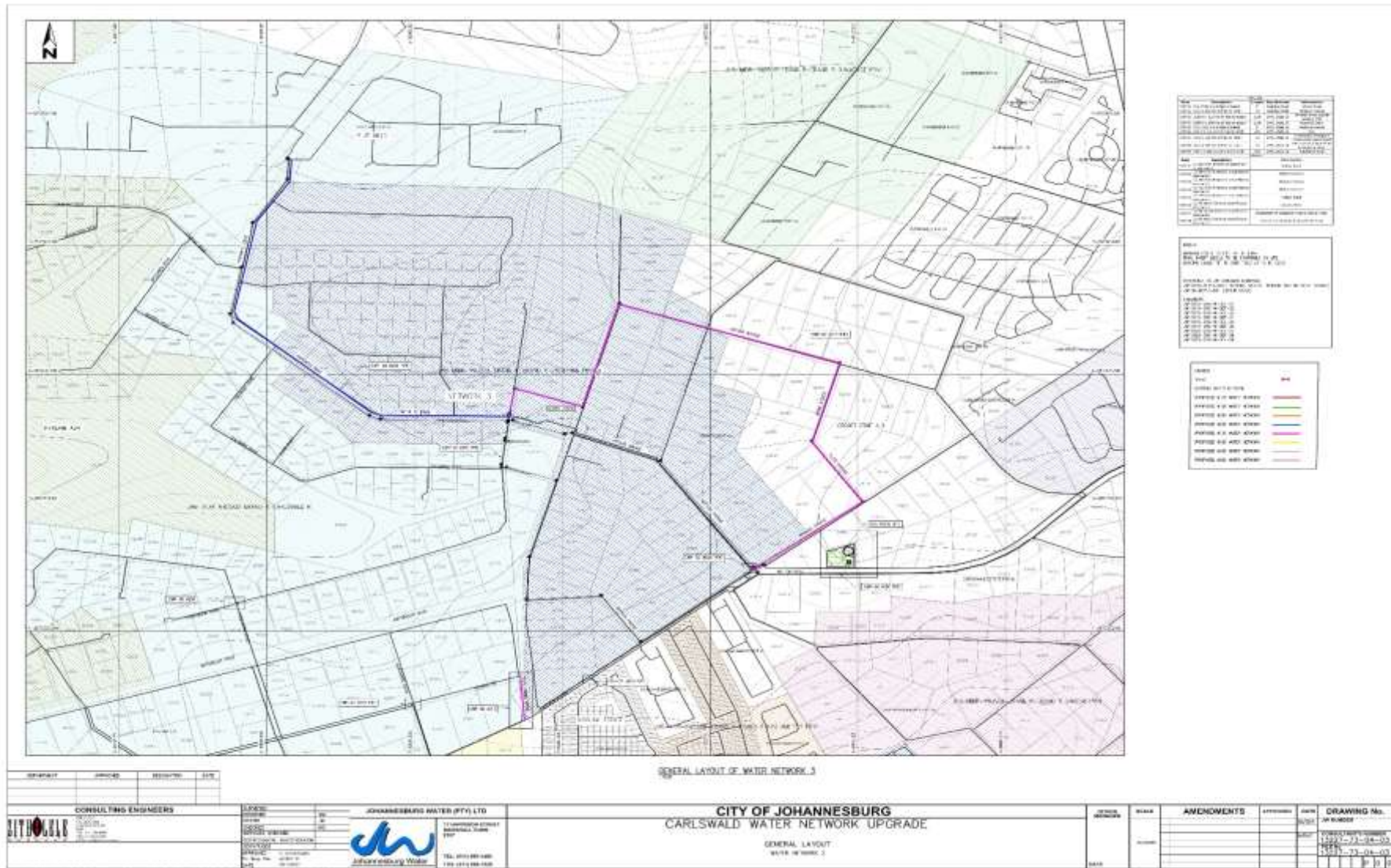


Figure 3-5: Site layout for pipeline Network 3

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### **3.2.4 Services**

#### Water Management

The proposed installation of pipeline will not require water. Where concrete is required, it will be delivered to site readily mixed and ready for usage. Where water is cut during any phase of the construction, Johannesburg Water will inform the affected residents 3 days prior to the water being cut.

#### Waste Management

The proposed installation of pipeline will not produce any waste. Excavated materials will be used as infill after installation of the pipeline.

#### Stormwater Management

The following stormwater mitigation measure will be adhered to during the construction phase of the project:

- Sandbags will be used in controlling storm water during construction, storm water runoff will be diverted away from works/disturbed area;
- If necessary, temporary cut off drains and berms may be constructed to divert/capture storm water run-off;
- Should trenches need to be dewatered, this will be done without causing damage to existing vegetation;
- Minimize disturbed area by phasing or sequencing construction and preserving existing vegetation where possible; and
- Inspect the site regularly and properly maintain it especially after heavy rain events.

#### Electricity

The proposed installation of pipeline will not require electricity. Therefore, no electricity will be sourced.

#### Traffic Management

The proposed installation will occur in the road reserve, and the methodology will be that of trenchless technology where the pipes cross the road. Where the trenchless methodology cannot be utilized, an application for open trench method will be submitted to the Johannesburg Roads Agency for approval. Adequate road signage will be placed on site, indicating the construction ahead, speed limit, and etc.

### **3.2.5 Development phases**

#### Pre-construction/Planning phase

Activities associated with the pre-development phase include:

- Undertaking necessary environmental approvals, authorisations, and registrations in terms of applicable environmental legislation. Zitholele has been appointed to undertake the Basic Assessment process to obtain Environmental Authorisation for the installation of the pipeline.

- 
- Appointment of a suitable contractor to undertake the construction during the installation process after an EA has been granted by the GDARD.

No intrusive activities that would require authorisation or a licence will therefore be undertaken during the pre-construction phase.

#### Construction phase

Construction activities associated with the installation of the pipeline in Carlswald include:

- Construction of temporary safety structures;
- Survey and Setting out - Design alignment and extent of cut to be marked onto ground;
- Site clearance of the pipe route;
- Temporary wooden profiles to be set up to maintain safe excavation slopes;
- Excavate trench within limits set out and stockpile for re-use;
- Trench bottoms to be compacted;
- Installation of the pipe bedding cradle;
- Laying and jointing of the pipe;
- Backfill of the trench with suitable material in layers of 150 mm;
- Compaction of each 150 mm layer of backfill.
- Testing of pipeline;

#### Operational phase

Operational activities will be provision of clean water to the Carlswald area.

#### **Decommissioning phase**

Johannesburg Water is not intending to decommission the pipeline and will be operated over a long-term period.

## **4 DESCRIPTION OF THE RECEIVING ENVIRONMENT**

### **4.1 Aspects of receiving environment considered**

The following aspects of the receiving environment have been considered in the EMPr.

#### Climate

The proposed activity is located in Johannesburg, which falls under the climatic conditions of Johannesburg. Johannesburg is located on the highveld plateau and has a subtropical highland climate. The city experiences a sunny climate, with the summer months, which is from October to April, characterized by hot days followed by afternoon thundershowers and cool evenings. The winter months are dry, sunny days followed by cold nights and are from May to September. Temperatures in Johannesburg are usually fairly mild due to the city's high elevation, with an average maximum daytime temperature in January of 25.6 °C, dropping to an average maximum of around 16 °C in June (IRG).

### Topography

The City of Johannesburg covers 1 600square kilometers of surface area and its topography range between 1400m-1700m above sea level. Topography of the **Linbro 1570m** above sea level. The complex is located in ward **32** in Region E of the Johannesburg area and the area has a gentle slope.

### Geology and Soils

### Heritage Resources

### Social characteristics

The City of Johannesburg Local Municipality is situated in the Gauteng Province and covers an area of 1 645km<sup>2</sup>. It is the largest city in South Africa, and the provincial capital of Gauteng, the wealthiest province in South Africa (Stats SA). According to Census 2011, the population within City of Johannesburg is about 4 434 827people with about 72,7%of the working age, 23,2% of young people and 4,1% of the elderly people. Unemployment rate in the municipality is approximately 25% with the unemployed of youth of 31,5%. Only 34,7% of the age group 20+ people in the municipality have a matric qualification.

### Terrestrial Ecology

### Hydrology

**Figure 6: Environmental Sensitivities and Features of the project site**



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## **5 ENVIRONMENTAL ROLES AND RESPONSIBILITIES**

### **5.1 Contractual obligation**

In order to ensure that this EMPr and/or derivatives thereof are enforced and implemented, these documents must be given legal standing. This shall be achieved through incorporating the EMPr and/or derivatives documents as an addendum any contract documents for the operations of Pikitup and specifying under particular conditions of the contract for any tender that the requirements of this EMPr and/or derivatives apply and must be met. This will ensure that the obligations are clearly communicated to contractors and that submitted tenders have taken into account and budgeted for the environmental requirements specified in this EMPr and/or its derivatives. The successful tender ultimately becomes the signed contract, thereby ensuring that the included EMPr becomes legally binding.

### **5.2 Responsibilities and Duties**

The key-role-players for the development are the relevant Competent Authority, the Developer (JW), Project Manager, Contractor, Sub-contractor, and the Environmental Control Officer (ECO). The detailed roles and responsibilities of each of these parties are outlined below.

#### **5.2.1 Competent Authority**

The Competent Authority or Licencing Authority has the responsibility to ensure that the developer complies with the conditions of the relevant Environmental Authorisations (EAs), licences and permit for the facility, as well as the requirements of the broader environmental legislation, specifically the National Environmental Management Act (NEMA) and National Water Act (NWA) and associated regulations. Compliance would be confirmed via the following mechanisms:

- Receipt and review of the environmental reporting required in terms of the EA, licence or permit; and
- *Ad hoc* and planned site inspection by the Competent Authority's Compliance and Enforcement unit.

The successful implementation of this EMPr requires cooperation between the developer, the appointed Project Manager or Plant Manager, and ECO.

#### **5.2.2 The Developer**

JW is the Developer and has overall responsibility for ensuring that its operations are undertaken in an environmentally sound and responsible manner, and in particular, reflects the requirements and specifications of the EMPr and recommendations from the relevant authorities.

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The responsibilities of the Developer will be to appoint or designate a suitably qualified Project Manager to manage the implementation of identified environmental mitigation and management measures for the facility. The Developer must:

- Establish and maintain regular and proactive communications with the designated/appointed PM, Contractor(s) and ECO; and
- Ensure that the EMPr is reviewed and updated as necessary.

#### Reporting Structure:

The developer will liaise with and/or take instruction from the following:

- Authorities; and
- General Public.

#### **5.2.3 Safety, Health, Environment and Quality Officer (SHEQO)**

The primary role of the SHEQO, or suitably qualified and appointed representative of the Developer, is to ensure that any appointed Contractor/s and the Developer's staff complies with the environmental specifications in the EMP. The PM shall further:

- Oversee the general compliance of the Contractor/s and the Developer's staff with the EMPr and other pertinent site specifications; and
- Liaise between and with the Contractor and ECO on environmental matters, as well as any pertinent engineering matters where these may have environmental consequences.

In addition and where relevant, e.g. during future construction phases, the SHEQO shall:

- Review and approve Method Statements produced by the Contractor in connection with the EMP;
- Assume overall responsibility for the effective implementation and administration of the EMP;
- Be familiar with the contents of the EMP, and his role and responsibilities as defined therein;
- Ensure that the EMPr is included in the Contractor's contract;
- Communicate to the Contractor, verbally and in writing, the advice of the ECO and the contents of the ECO reports;
- In conjunction with the Construction Supervisor; undertake regular inspections of the Contractor's site as well as the installation works in order to check for compliance with the EMPr in terms of the specifications outlined therein. Inspections shall take place at least once a week and copies of the monitoring checklist contained in the file;
- Review and approve drawings produced by the Contractor or professional team in connection with, for example, the construction site layout, etc.;
- Issue site instructions giving effect to the ECO requirements where necessary;

- 
- Keep a register of all complaints and incidents (spills, injuries, complaints, legal transgressions, etc) and other documentation related to the EMP;
  - Report to the ECO any problems (or complaints) which cannot first be resolved in co-operation with the Contractor(s);
  - Implement recommendations of possible audits;
  - Implement Temporary Work Stoppages as advised by the ECO, where serious environmental infringements and non-compliances have occurred;
  - Facilitate proactive communication between all role-players in the interests of effective environmental management; and
  - Ensure that construction staff is trained in accordance with requirements of the EMP.

#### Reporting Structure:

The SHEQO will report to the Developer, as and when required.

#### **5.2.4 Contractor, including appointed Sub-Contractors**

The Developer, or SHEQO acting on his behalf, will appoint a Contractor(s) to implement any future placement of the water pipeline. The Contractor(s) will be contractually required to undertake their activities in an environmentally responsible manner, as described in the EMP.

The role of the Contractor shall be to:

- Ensure that the environmental specifications of this document (including any revisions, additions or amendments) are effectively implemented. This includes the on-site implementation of steps to mitigate environmental impacts;
- Preserve the natural environment by limiting any destructive actions on site;
- Ensure that suitable records are kept and that the appropriate documentation is available to the SHEQO;
- Take into consideration the legal rights of the servitude owner (Johannesburg Road Agency) and, Communities;
- Ensure quality in all work done, technical and environmental, and
- Ensure that all subcontractors and other workers appointed by the Contractor are complying with and implementing the EMPr during the duration of their specific contracts.

The responsibilities of the Contractor will be to:

- Discuss implementation of and compliance with this document with staff at routine site meetings;
- Designate, appoint and/or assign tasks to personnel who will be responsible for managing all or parts of the EMP;
- Monitor environmental performance and conformance with the specifications contained in this document during site inspections;
- Report progress towards implementation of and non-conformances with this document at site meetings with the SHEQO;
- Advise the SHEQO of any incidents or emergencies on site, together with a record of action taken;

- 
- Report and record all accidents and incidents resulting in injury or death; and
  - Resolve problems and claims arising from damage immediately to ensure a smooth flow of operations;

Reporting Structure:

The Contractor will report to the SHEQO and ECO, as and when required.

### **5.2.5 Environmental Control Officer (ECO), during any construction phases**

Through the SHEQO, Pikitup will appoint an ECO to monitor and oversee implementation of the EMPr for its works. The ECO is given authority to ensure that the EMPr is fully implemented and that appropriate actions are undertaken to address any discrepancies and non-compliances.

The role of the ECO shall be to:

- Act as site 'custodian' for the implementation, integration and maintenance of the EMPr in accordance with the contractual requirements;
- Ensure successful implementation of the EMP; and
- Ensure that the Contractor, his employees and/or Subcontractors receive the appropriate environmental awareness training prior to commencing activities.

The responsibilities of the ECO will be to:

- Liaise with the SHEQO on the level of compliance with the EMPr achieved by the Contractor on a regular basis for the duration of the contract;
- Advise the PM on the interpretation and enforcement of the Environmental Specifications (ES), including evaluation of non-compliances;
- Supply environmental information as and when required;
- Review and approve Method Statements produced by the Contractor, in conjunction with the SHEQO;
- Demarcate particularly sensitive areas (including all No-Go areas) and to pass instructions through the SHEQO concerning works in these areas;
- Monitor any basic physical changes to the environment as a consequence of the construction works according to an audit schedule;
- Attend regular site meetings and project steering committee meetings;
- Undertake regular monthly audits of the construction works and to generate monthly audit reports. These reports are to be forwarded to the PM who will communicate the results and conclusions with the Developer;
- Communicate frequently and openly with the Contractor and the SHEQO to ensure effective, proactive environmental management, with the overall objective of preventing or reducing negative environmental impacts and/or enhancing positive environmental impacts;

- Advise the SHEQO on remedial actions for the protection of the environment in the event of any accidents or emergencies during construction, and to advise on appropriate clean-up activities;
- Review complaints received and made instructions as necessary; and
- Identify and make recommendations for minor amendments to the EMPr as and when appropriate.

Reporting Structure:

The ECO will report to the SHEQO, who in turn will report to Pikitup.

## 6 ENVIRONMENTAL ISSUES IDENTIFIED

### 6.1.1 Aquatic Impact Assessment

One watercourse was recorded on the study site and was classified as the headwaters of an unchannelled valley bottom wetland. The wetland has however become incised due to surface and stormwater input from the surroundings. Other wetlands occur near the study site, but these are well-buffered and very unlikely to be impacted by the proposed activities. The wetland recorded on the study site is largely fragmented by the N3 highway and is further impacted by the landfill. The functionality of the wetland is therefore significantly compromised. Furthermore, several pools of water were recorded on the study site.

These pools were formed by the artificial landscape of the landfill and are considered to be artificial in nature and are unlikely to provide any significant functionality. The Figure 6-1 below presents the delineated wetlands together with their associated buffer zones and the Department of Water and Sanitation (DWS) regulated area.

The location of the proposed activities associated with the upgrade of the Linbro Park WMF does not fall within the DWS 500m regulated area of wetlands. However, the boundary wall that will be replaced, occurs within the wetland. Therefore, this activity will require a WULA in terms of the National Water Act, 1998 (Act No. 36 of 1998) and an EA in terms of the NEMA: EIA Regulations.

#### Identified Impacts

Potential impacts associated with the upgrade of the WMF are associated with earthworks in the construction phase and includes sediment pollution and spills of hydrocarbons from construction vehicles. However, the proposed upgrade of the WMF is approximately 1.8 km from the wetland, and thus, not likely to be impacted.

The proposed refurbishment of the boundary wall within the WMF, will take place within the wetland. The location of the collapsed boundary wall runs through the wetland and the proposed refurbishment of the wall in its current location may cause limited impacts on the wetland. However, the current boundary wall does not appear to include sufficient stormwater drainage, and an upgraded boundary wall which will include drainage openings may improve hydrological connectivity between wetland fragments.

**Table 6-1: The important factors relevant to the project are summarised in Table below:**

	Quaternary Catchment and Water Management Area areas	Important Rivers possibly affected
	A21C Limpopo WMA	Wetland drains into the Jukskei River

Integrity and functional status of the wetland	<p><b>Ecosystem Services (Kotze <i>et al.</i>, 2020): All scored Zero</b></p> <p><b>Present Ecological Score: E</b> - The change in ecosystem processes and loss of natural habitat and biota is great but some remaining natural habitat features are still recognizable.</p> <p><b>REC: Improve to D</b></p>			
NEMA 2014 Impact Assessment	The impact scores for the following aspects are relevant:	Without Mitigation	With Mitigation	
	Changes to flow dynamics	Construction Phase	M	L
		Operation Phase	M	L
	Sedimentation	Construction Phase	L	L
		Operation Phase	L	L
	Establishment of alien plants	Construction Phase	M	L
		Operation Phase	M	L
	Pollution of watercourses	Construction Phase	L	L
		Operation Phase	L	L
	Loss of fringe vegetation and habitat	Construction Phase	L	L
		Operation Phase	L	L
	Loss of aquatic habitat	Construction Phase	L	L
		Operation Phase	L	L
	DWS (2016) Risk Assessment	The risk scores for the operational and construction phase of upgrading the current boundary wall fall in the <b>Low</b> category. Authorisation may proceed through a General Authorisation.		
	Does the specialist support the development?	Yes, no negative impact to downstream watercourses is expected to result from the construction or operation of WMF infrastructure and the upgrade of the boundary wall. Inclusion of with adequate stormwater drainage into the wall design may improve connectivity between wetland fragments.		

**Figure 6-1: Identified wetlands**



Site-specific mitigation measures

The site-specific mitigation measures provided in Section 7 must be implemented and/or maintained in order to ensure identified impacts are mitigated and maintained within acceptable levels.

## **7 SITE-SPECIFIC ENVIRONMENTAL MANAGEMENT MEASURES**

The management measures documented in each of the sub-sections below have been compiled using the following information:

- Impact Assessment and mitigation measures documented in the EIA for the facility;
- Mitigation and management recommendations provided by the specialist studies and EAP; and
- Best Practice measures and guidelines for construction and environmental management.

The mitigation and management measures relating to each anticipated impact are described in Table 8-1.

**7.1 Impacts and Mitigation Measures during Pre-Construction Phase**

No impacts have been identified during the pre-construction phase.

**7.2 Impacts and Mitigation Measures during Construction Phase**

**Table 7-1: Construction Activities Management**

<b>Impact management outcomes:</b>						
<ul style="list-style-type: none"> <li>• Undertake responsible water usage;</li> <li>• To ensure no pollution of surface and groundwater resources;</li> <li>• To ensure no instances of erosion on or adjacent to the site is reported or identified;</li> <li>• Ensure that the stormwater management plan is implemented;</li> <li>• Minimal impacts on wetlands, streams and rivers; and</li> <li>• Prevent dust fallout exceedances from occurring within the dust monitoring network.</li> </ul>						
No.	Activity	Mitigation Measures	Duration	Frequency	Responsible Person	Method of Monitoring
1	Soil and topsoil management	Topsoil must be placed and stored at a designated area within the development site footprint.	Throughout Project	Ongoing	Developer	Monthly Compliance Monitoring
		Topsoil stockpiles should not be stacked higher than 1.5m in height.	Throughout Project	Ongoing	Developer, SHEQO, or designated responsible person	Monthly Compliance Monitoring
		Topsoil stockpiles should be checked by a designated responsible person daily for evidence of disturbance or erosion. In the event erosion is identified, the stockpiles should be reshaped and covered with a cover to prevent water ingress into the topsoil stockpile.	Throughout Project	Ongoing	SHEQO, or designated responsible person	Monthly Compliance Monitoring
		An Environmental Control Officer must be appointed to monitor the compliance with conditions of the Environmental Management Programme (EMPr).	Throughout Project	Ongoing	Developer	Monthly Compliance Monitoring
		Appropriate measures should be implemented to prevent potential soil pollution through fuel and oil leaks and spills and then compliance monitored by an appropriate person.	Throughout Project	When necessary	SHEQO, or designated responsible person	Monthly Compliance Monitoring

No.	Activity	Mitigation Measures	Duration	Frequency	Responsible Person	Method of Monitoring
		Make sure construction vehicles are maintained and serviced to prevent oil and fuel leaks.	Throughout Project	Ongoing	SHEQO, or designated responsible person	Monthly Compliance Monitoring
		All vehicles and plants must be checked daily for potential leaks and spillages.	Throughout Project	Ongoing	SHEQO, or designated responsible person	Monthly Compliance Monitoring
		Where spillages have been identified, they must be cleaned and remediated immediately by removing the contaminated soil and disposing it in an environmentally responsible manner.	Throughout Project	Ongoing	SHEQO, or designated responsible person	Monthly Compliance Monitoring
		Where unavoidable, emergency on-site maintenance should be done over appropriate drip trays and all oil or fuel must be disposed of according to waste regulations. Drip trays must be placed under vehicles and equipment when not in use.	Throughout Project	Ongoing	SHEQO, or designated responsible person	Monthly Compliance Monitoring
2	Management of terrestrial and aquatic resources	Ensure that vegetation clearing is kept only within the boundary of the proposed site.	Throughout Project	Ongoing	Developer	Monthly Compliance Monitoring
		Drip trays or appropriate spillage containers must be used when components that require petrochemicals or lubricating oils are installed and filled.	Throughout Project	Ongoing	SHEQO, or designated responsible person	Monthly Compliance Monitoring
		The applicant must identify and capacitate a designated staff member/s to execute the containment and clean-up of any spillages that may occur during the installation of infrastructure.	Throughout Project	When necessary	Developer	Monthly Compliance Monitoring
		The applicant must facilitate environmental awareness, emergency preparedness, and emergency response procedures training to staff/contractors involved in the installation of the plant.	Throughout Project	Ongoing	SHEQO, or designated responsible person	Monthly Compliance Monitoring
		Any spillages that occur must be contained and cleaned up immediately by the designated trained staff	Throughout Project	When necessary	Developer, SHEQO, or designated responsible person	Monthly Compliance Monitoring
		No material, substances, or liquids may be placed or disposed of into any stormwater infrastructure or areas not designated for storage of waste at any time.	Throughout Project	Ongoing	Developer, SHEQO, or designated responsible person	Monthly Compliance Monitoring

No.	Activity	Mitigation Measures	Duration	Frequency	Responsible Person	Method of Monitoring
		Construction methods should be carefully reviewed to ensure the least impact on the watercourse is ensured.	Throughout Project	Ongoing	Developer, SHEQO, or designated responsible person	Monthly Compliance Monitoring
		The Stormwater Monitoring and Management Plan developed for the Linbro Park WMF must be implemented to ensure effective stormwater management during the construction phase.	Throughout Project	Ongoing	Developer, SHEQO, or designated responsible person	Monthly Compliance Monitoring
		High energy stormwater input into the watercourses should be prevented at all costs.	Throughout Project	Ongoing	Developer, SHEQO, or designated responsible person	Monthly Compliance Monitoring
		Sediment control should be effective and not allow any release of sediment pollution downstream. This should be audited on a weekly basis to demonstrate compliance with upstream conditions.	Throughout Project	Ongoing	Developer, SHEQO, or designated responsible person	Monthly Compliance Monitoring
		Where necessary, corrective action should be determined by a team of specialists including engineers, hydrologists, and ecologists	Throughout Project	Ongoing	Developer, SHEQO, or designated responsible person	Monthly Compliance Monitoring
5	Traffic management	Pikitup must monitor vehicles entering the premises and ensure such vehicles are always roadworthy and in good working condition.	Throughout Project	Ongoing	Developer	Monthly Compliance Monitoring
		Pikitup must ensure all vehicles carrying material to and from the construction site are covered with a tarpaulin as necessary. This is specifically relevant when raw material, construction sand, grit, and gravel are transported to and from the site.	Throughout Project	Ongoing	Developer	Monthly Compliance Monitoring
6	Noise Management	Construction activities must only be undertaken during daylight hours. No night work will be allowed.	Throughout Project	ongoing	Developer	Monthly Compliance Monitoring
		All plant machinery, cooling towers, compressors, and other noise generating equipment on site should be subject to regular inspection and appropriate maintenance in order to prevent any gradual increase in average noise rating levels as moving parts incur normal wear and tear.	Throughout Project	ongoing	Developer, SHEQO, or designated responsible person	Monthly Compliance Monitoring

No.	Activity	Mitigation Measures	Duration	Frequency	Responsible Person	Method of Monitoring
		All construction staff, workers, and visitors must comply with the full PPE requirements at all times during the construction phase while on site. Individuals not complying with these requirements must be dealt with in terms of Pikitup's existing compliance protocols.	Throughout Project	ongoing	SHEQO, or designated responsible person	Monthly Compliance Monitoring
7	Health and Safety	All contractors and visitors must adhere strictly to Pikitup's existing Health and Safety system and protocols.	Throughout Project	Ongoing	Developer	Monthly Compliance Monitoring
		No-go areas within the existing plant area must be identified and communicated to all contractors and staff to ensure unauthorised entry into these areas is prevented.	Throughout Project	Ongoing	Developer, SHEQO, or designated responsible person	Monthly Compliance Monitoring
		All construction staff, workers, and visitors must comply with the full PPE requirements at all times during the construction phase while on site. Individuals not complying with these requirements must be dealt with in terms of Pikitup's existing compliance protocols.	Throughout Project	Ongoing	SHEQO, or designated responsible person	Monthly Compliance Monitoring
8	Socio-economic	Leverage this through procurement policies that favour local suppliers and businesses.	Throughout Project	When necessary	Developer	Monthly Compliance Monitoring

### 7.3 Impacts and Mitigation Measures during Operational Phase

**Table 7-2: Operational Activities Management**

<p><b>Impact management outcomes:</b></p> <ul style="list-style-type: none"> <li>• Undertake responsible water usage;</li> <li>• To ensure no pollution of surface and groundwater resources;</li> <li>• To ensure no instances of erosion on or adjacent to the site is reported or identified;</li> <li>• Ensure that the stormwater management plan is implemented;</li> <li>• Minimal impacts on wetlands, streams and rivers;</li> <li>• Prevent dust fallout exceedances from occurring within the dust monitoring network; and</li> <li>• Prevent air emission exceedances of the National Ambient Air Quality Standards.</li> </ul>
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No.	Activity	Mitigation Measures	Duration	Frequency	Responsible Person	Method of Monitoring
1	Management of terrestrial and aquatic resources	The applicant must identify and capacitate a designated staff member/s to execute the containment and clean-up of any spillages that may occur during the installation of infrastructure.	Throughout Project	Ongoing	Developer	Monthly Compliance Monitoring
		Drip trays or appropriate spillage containers must be used when components that require petrochemicals or lubricating oils are installed and filled.	Throughout Project	Ongoing	SHEQO, or designated responsible person	Monthly Compliance Monitoring
		The applicant must identify and capacitate a designated staff member/s to execute the containment and clean-up of any spillages that may occur during the installation of infrastructure.	Throughout Project	When necessary	Developer	Monthly Compliance Monitoring
		The applicant must facilitate environmental awareness, emergency preparedness, and emergency response procedures training to staff/contractors involved in the installation of the plant.	Throughout Project	Ongoing	SHEQO, or designated responsible person	Monthly Compliance Monitoring
		Any spillages that occur must be contained and cleaned up immediately by the designated trained staff	Throughout Project	When necessary	Developer, SHEQO, or designated responsible person	Monthly Compliance Monitoring
		No material, substances, or liquids may be placed or disposed of into any stormwater infrastructure or areas not designated for storage of waste at any time.	Throughout Project	Ongoing	Developer, SHEQO, or designated responsible person	Monthly Compliance Monitoring
		Construction methods should be carefully reviewed to ensure the least impact on the watercourse is ensured.	Throughout Project	Ongoing	Developer, SHEQO, or designated responsible person	Monthly Compliance Monitoring
		The Stormwater Monitoring and Management Plan developed for the Linbro Park WMF must be implemented to ensure effective stormwater management during the construction phase.	Throughout Project	Ongoing	Developer, SHEQO, or designated responsible person	Monthly Compliance Monitoring
		High energy stormwater input into the watercourses should be prevented at all costs.	Throughout Project	Ongoing	Developer, SHEQO, or designated responsible person	Monthly Compliance Monitoring

No.	Activity	Mitigation Measures	Duration	Frequency	Responsible Person	Method of Monitoring
		Sediment control should be effective and not allow any release of sediment pollution downstream. This should be audited on a weekly basis to demonstrate compliance with upstream conditions.	Throughout Project	Ongoing	Developer, SHEQO, or designated responsible person	Monthly Compliance Monitoring
		Where necessary, corrective action should be determined by a team of specialists including engineers, hydrologists, and ecologists	Throughout Project	Ongoing	Developer, SHEQO, or designated responsible person	Monthly Compliance Monitoring
3	Traffic management	Pikitup must monitor vehicles entering the premises and ensure such vehicles are always roadworthy and in good working condition.	Throughout Project	Ongoing	Developer	Monthly Compliance Monitoring
		Pikitup must ensure all vehicles carrying material to and from the construction site are covered with a tarpaulin as necessary. This is specifically relevant when raw material, construction sand, grit, and gravel are transported to and from the site.	Throughout Project	Ongoing	Developer	Monthly Compliance Monitoring
4	Noise Management	Construction activities must only be undertaken during daylight hours. No night work will be allowed.	Throughout Project	ongoing	Developer	Monthly Compliance Monitoring
		All plant machinery, cooling towers, compressors, and other noise generating equipment on site should be subject to regular inspection and appropriate maintenance in order to prevent any gradual increase in average noise rating levels as moving parts incur normal wear and tear.	Throughout Project	ongoing	Developer, SHEQO, or designated responsible person	Monthly Compliance Monitoring
		All construction staff, workers, and visitors must comply with the full PPE requirements at all times during the construction phase while on site. Individuals not complying with these requirements must be dealt with in terms of Pikitup's existing compliance protocols.	Throughout Project	ongoing	SHEQO, or designated responsible person	Monthly Compliance Monitoring
5	Health and Safety	All employees and visitors must adhere strictly to Pikitup's existing Health and Safety system and protocols.	Throughout Project	Ongoing	Developer	Monthly Compliance Monitoring
		No-go areas within the existing plant area must be identified and communicated to all contractors and staff to ensure unauthorised entry into these areas is prevented.	Throughout Project	Ongoing	Developer, SHEQO, or designated responsible person	Monthly Compliance Monitoring



No.	Activity	Mitigation Measures	Duration	Frequency	Responsible Person	Method of Monitoring
		All construction staff, workers, and visitors must comply with the full PPE requirements at all times during the construction phase while on site. Individuals not complying with these requirements must be dealt with in terms of Pikitup's existing compliance protocols.	Throughout Project	Ongoing	SHEQO, or designated responsible person	Monthly Compliance Monitoring
6	Socio-economic	The Competent Authority should authorise the application in the shortest period of time once all information required to make a decision has been received.	Throughout Project	When necessary	Developer	Monthly Compliance Monitoring

#### 7.4 Impacts and Mitigation Measures during Decommissioning Phase

No impacts have been identified during the decommissioning phase.

## 8 GENERAL ENVIRONMENTAL MANAGEMENT MEASURES

### 8.1 General Management Measures during Construction

#### 8.1.1 Management of Water and Stormwater

**Table 8-1: Water and Stormwater Management**

<b>Impact management outcomes:</b>						
<ul style="list-style-type: none"> <li>To ensure that the water source has been secured;</li> <li>To ensure that there is sufficient water supply for the operational activities to be applied for;</li> <li>Undertake responsible water usage;</li> <li>Pollution and contamination of the watercourse environment and erosion are prevented;</li> <li>Ensure that the stormwater management plan is implemented;</li> <li>Minimal impacts on wetlands, streams and rivers; and</li> <li>Impacts to the environment caused by stormwater and wastewater discharge during construction are avoided</li> </ul>						
No.	Activity	Mitigation Measures	Duration	Frequency	Responsible Person	Method of Monitoring
1	Potable Water Sources	Should water be required from sources other than Johannesburg Water supply, a written agreement shall be reached between Pikitup and the stakeholder involved.	Throughout Project	When necessary	Developer	Monthly Compliance Monitoring
		Should Pikitup be required to use water from a natural source, Pikitup shall supply a method statement to that effect and obtain the required permits. No construction shall take place in the wetland, streams and other river courses without the necessary water license from the Department of Water and Sanitation.	Throughout Project	Monthly	Developer, SHEQO, or designated responsible person	Monthly Compliance Monitoring
2.	Stormwater Management	Ensure that the stormwater management plan is compiled by a stormwater competent professional engineer to the satisfaction of the Johannesburg Road Agency.	Throughout Project	Monthly	Professional Engineer, Scientist, Developer	Monthly Compliance Monitoring
		A stormwater management plan shall be in place to ensure that surface run-off from hard-surfaced areas is adequately managed so that surface water does not enter or exit polluted areas.	Throughout Project	Monthly	SHEQO, or designated responsible person	Monthly Compliance Monitoring

No.	Activity	Mitigation Measures	Duration	Frequency	Responsible Person	Method of Monitoring
		Stormwater from polluted areas shall not be allowed to enter into the natural environment, unless continuously monitored and reported to the Department.	Throughout Project	Monthly	SHEQO, or designated responsible person	Monthly monitoring report
		No stormwater from polluted areas shall be allowed onto permeable areas as this may cause pollution to groundwater.	Throughout Project	Monthly	SHEQO, or designated responsible person	Monthly Compliance Monitoring
		Water contaminated with oils shall not be allowed to enter the natural environment, nor shall it be allowed to enter the municipal stormwater system without being separated.	Throughout Project	Monthly	SHEQO, or designated responsible person	Incident management reporting.
		Should any water be discharged into the environmental, is should be tested first to comply with relevant discharge parameters.	Throughout Project	Monthly	SHEQO, or designated responsible person	Monthly monitoring report
		Adequate measures must be in place to prevent polluted runoff water from leaving the site, thus preventing surface and groundwater pollution as well as nuisance to the neighbouring community.	Throughout Project	Monthly	SHEQO, or designated responsible person	Monthly monitoring report

### 8.1.2 Management of Hazardous Substances

Table 8-2 Hazardous substances

<b>Impact management outcomes:</b>						
<ul style="list-style-type: none"> <li>Safe storage, handling, use and disposal of hazardous substances</li> </ul>						
No.	Activity	Mitigation Measures	Duration	Frequency	Responsible Person	Method of Monitoring
1	Hazardous Substances Spills	Appropriate training for the handling and use of spill treatment materials to be provided by Pikitup/Contractors as necessary. This includes providing for any kind of spills and pollution threats that may occur.	Throughout Project	Quarterly and as needed	SHEQO, or designated responsible person	Monthly Compliance Monitoring
		Products should be clearly labelled, and symbolic safety/hazard warning signs should be provided.	Throughout Project	Once-off	SHEQO, or designated responsible person	Monthly Compliance Monitoring

No.	Activity	Mitigation Measures	Duration	Frequency	Responsible Person	Method of Monitoring
		Fuel and chemical depot(s) shall be located at least 100 m from any water body and shall be within a bunded area with 110% capacity.	Throughout Project	Once-off	SHEQO, or designated responsible person	Monthly Compliance Monitoring
		Ensure that suitable spill kits and absorption materials are purchased and stored suitably in places where there is a high risk of hazardous spills occurring.	Throughout Project	Once-off	SHEQO, or designated responsible person	Monthly Compliance Monitoring
		All potentially hazardous raw and waste materials are to be handled by Pikitup/Contractor's trained staff and stored on site in accordance with manufacturer's instructions and legal requirements	Throughout Project	When necessary	SHEQO, or designated responsible person	Monthly Compliance Monitoring
		Areas for the storage of fuel and other flammable materials shall comply with standard fire safety regulations.	Throughout Project	Continuous	SHEQO, or designated responsible person	Monthly Compliance Monitoring
		The relevant Material Safety Data Sheets (MSDS) shall be available on site. Procedures detailed in the MSDS shall be followed in the event of an emergency situation.	Throughout Project	Daily	SHEQO, or designated responsible person	Monthly Compliance Monitoring
		Smaller spills can be treated on site.	Throughout Project	When necessary	SHEQO, or designated responsible person	Incident management reporting.
		A specialist Contractor shall be used for the bio-remediation of contaminated soil where the required remediation material and expertise is not available on site.	Throughout Project	When necessary	SHEQO, or designated responsible person	Incident management reporting.
		All spills of hazardous substances must be reported to the Waste Management Control Officer.	Throughout Project	When necessary	SHEQO, or designated responsible person	Incident management reporting.
		Ensure that rehabilitated areas are free of visible spills.	Throughout Project	When necessary	SHEQO, or designated responsible person	Monthly Compliance Monitoring
		Where hazardous substances are removed from site for disposal, proof of disposal for auditing purposes shall be kept in the form of disposal certificates.	Throughout Project	Monthly	SHEQO, or designated responsible person	Monthly Compliance Monitoring

### 8.1.3 Delivery of Materials

**Table 8-3: Environmental Management Measures for the delivery of materials**

<b>Impact management outcomes:</b>						
<ul style="list-style-type: none"> <li>To ensure that all sub-contractors responsible for delivering materials to site operate in an environmentally friendly manner whilst on site; and</li> <li>To ensure that the activities related to material deliveries do not create an unnecessary impact on the environment.</li> </ul>						
<b>No.</b>	<b>Activity</b>	<b>Mitigation Measures</b>	<b>Duration</b>	<b>Frequency</b>	<b>Responsible Person</b>	<b>Method of Monitoring</b>
1	Vehicles and plant entering the plant	All vehicles and heavy plant entering the site will be checked upon entry for leaks or spills.	Throughout operational phase	Daily	SHEQO, or designated responsible person	Monthly Compliance Monitoring
		Loading and unloading from vehicles shall only be allowed in the designated areas.	Throughout operational phase	Daily	SHEQO, or designated responsible person	Monthly Compliance Monitoring
		Vehicles will be monitored during loading and offloading while on site.	Throughout operational phase	Daily	SHEQO, or designated responsible person	Monthly Compliance Monitoring
		No washing of vehicles will be allowed on site, unless within a designated wash area suitably designed to manage wash water runoff in a sustainable and environmentally appropriate manner.	Throughout operational phase	Daily	SHEQO, or designated responsible person	Monthly Compliance Monitoring
		In the event that offloading of material cause a localised dust nuisance, appropriate measures to eliminate or reduce the dust nuisance levels to acceptable levels must be implemented immediately.	Throughout operational phase	Daily	SHEQO, or designated responsible person	Incident management reporting.

### 8.1.4 Waste Management

**Table 8-4: Waste Management**

<b>Impact management outcomes:</b>						
<ul style="list-style-type: none"> <li>Waste is appropriately stored, handled and safely disposed of at an authorised/ recognised waste treatment facility.</li> </ul>						
<b>No.</b>	<b>Activity</b>	<b>Mitigation Measures</b>	<b>Duration</b>	<b>Frequency</b>	<b>Responsible Person</b>	<b>Method of Monitoring</b>
1	Waste handling and removal	All waste and excess material on site shall be disposed in an appropriate manner and within a designated area.	Throughout Project	Throughout	SHEQO, or designated responsible person	Monthly Compliance Monitoring
		All types of waste generated during operation must be disposed of in accordance with the municipal waste disposal requirements. Proper recycling containers/areas should be appropriately marked in such a way that users can easily identify them.	Throughout Project	Throughout	SHEQO, or designated responsible person	Monthly Compliance Monitoring
		All non-recyclable material shall be removed from site and disposed of at a registered disposal facility and not burned on site.	Throughout Project	Throughout	SHEQO, or designated responsible person	Monthly Compliance Monitoring
		Only registered landfill sites to be used for disposal of all waste generated on site.	Throughout Project	Throughout	SHEQO, or designated responsible person	Monthly Compliance Monitoring
		Handling and transport of erodible materials must be avoided under high wind conditions or when a visible dust plume is present.	Throughout Project	Throughout	SHEQO, or designated responsible person	Monthly Compliance Monitoring
		No hazardous material, e.g., oil or diesel fuel shall be disposed of in any unregistered waste site.	Throughout Project	Throughout	SHEQO, or designated responsible person	Monthly Compliance Monitoring
		All construction rubble shall be removed and disposed of as described above.	Throughout Project	Daily	SHEQO, or designated responsible person	Monthly Compliance Monitoring
		Broken, damaged and unused material shall be picked up and removed from site.	Throughout Project	Daily	WMCO	Monthly Compliance Monitoring
		Waste will be removed during off-peak traffic periods to minimise impacts on local traffic patterns.	Throughout Project	Weekly	WMCO, C	Monthly Compliance Monitoring

## **8.2 General requirements during the operation**

The following measures must be implemented during the operational phase:

- Proper and continuous liaison between Pikitup, all contractors and landowners must take place to ensure that everyone is informed of construction activities at all times.
- Pikitup/Contractor must adhere to all conditions of contract, including the EMPr.
- Proper site management and regular monitoring of site works.
- Proper documentation and record keeping of all complaints and actions taken.
- Regular site inspections and good control over the operational process throughout the construction and operational period.
- Environmental audits to be carried out.

## **8.3 Stormwater Monitoring and Management Plan**

The development of hard surfaces will give rise to greater volumes and velocity of runoff waters during high peak flows. This water will drain into the roads and stormwater management system. Localised flooding may result in negative impacts on bed and banks of the stream course due to the cumulative effects. Refer to the Stormwater Monitoring and Management Plan in Appendix B for detailed mitigation measures.

## **8.4 Site Documentation / Reporting**

The following is a list of documentation amongst others, which must be held on site and must be made available to the ECO and/or authorities on request:

- Site daily diary /instruction book/ Incident reports;
- Records of all remediation / rehabilitation activities;
- Copies of ECO reports (management and monitoring);
- EMP;
- Complaints register;
- Method statements; and
- Environmental Authorisation and Water Use License (WUL).

The standard Pikitup site documentation shall be used to keep records on site. In addition, all non-compliances to the EA and the WUL will be reported to the Director: Environmental Impact Evaluation and the relevant DWS official within 48 hours. 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. The documentation shall be signed by all parties to ensure that such documents are legitimate. Regular monitoring of all sites works by the ECO is imperative to ensure that all problems encountered are solved punctually and amicably. When the ECO is not available, a designated responsible person shall keep abreast of all works to ensure no problems arise.

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## 9 ENVIRONMENTAL AWARENESS PLAN

Environmental awareness training is required for all personnel performing active duties on site. This includes all employees working on the site including temporary labourers, contractors, and subcontractors. The Environmental Awareness Plan is intended to describe the method that will be adopted by the proponent to inform any person acting on their behalf, including an agent, sub-contractor, employee, or any person rendering a service, of any environmental risk which may result from the implementation of the project activities and the manner in which risks must be managed in order to avoid adverse environmental consequences.

Environmental awareness training should cover:

- The importance of the EMPr;
- Specific details of the EMPr;
- Employees role in compliance with the EMPr;
- Environmental effects associated with the activities;
- Training targeted at specific personnel, e.g. example operators of heavy machinery;
- The environmental impacts, actual or potential, of their work activities;
- The environmental benefits of improved personal performance;
- Their roles and responsibilities in achieving conformance with the environmental policy and procedures;
- Emergency preparedness and response requirements;
- The potential consequences of departure from specified operating procedures;
- The mitigation measures required to be implemented when carrying out their work activities;
- Environmental legal requirements and obligations;
- The importance of not littering;
- The importance of using supplied toilet facilities;
- The need to use water and electricity sparingly; and
- Details of and encouragement to minimise the production of waste and re-use, recover and recycle waste where possible.

Training should be conducted by a suitably qualified person and if necessary, in more than one language to ensure it is understood by all workers. Copies of the environmental training must be available on site in languages appropriate to the work force. Records of the training sessions including attendance registers, nature of training and date of training should be kept ensuring all parties have received the necessary training and for auditing purposes.

In addition to training, general environmental awareness must be fostered among the project's workforce to encourage the implementation of environmentally sound practices throughout its duration. Environmental awareness and training are an important aspect of the implementation of the EMP. Once the awareness plan and training material are available, the entire workforce and project management team should undergo an environmental awareness training course.



Environmental awareness training is critical for the workforce to understand how they can play a role in achieving the objectives specified in the EMP. All visitors to the site (including project team members which are not based onsite), must undergo Environmental Induction before being permitted to the construction and associated area. The Environmental Induction should be structured so as to provide a condensed version of the comprehensive Environmental Awareness Training that will be provided to the workforce / onsite staff.

Environmental awareness could be fostered in the following manner:

- Induction for all workers on site, before commencing work;
- Refresher courses as and when required;
- Daily toolbox talks, where relevant, at the start of each day with all workers coming on site, where workers might be alerted to particular environmental concerns associated with their tasks for that day or the area/habitat in which they are working; and
- Courses must be given by suitably qualified personnel and in a language and medium understood by workers/employees.

The Environmental Awareness Plan should be drawn up by the Developer, in consultation with the ECO, where applicable, and SHEQO, and should be kept for implementation and audit purposes. The Environmental Awareness Plan should be a dynamic document (or set of documents) which should be updated as changes to the project, environment, staff and etc. occur.

## **10 MONITORING**

### **10.1.1 Undertaking audits**

The Developer or PM shall appoint a qualified and experienced external environmental auditor to undertake an annual environmental compliance audit of the facility to ensure implementation with and adherence to the EMP.

### **10.1.2 Compliance with the EMPr**

The Developer and/or its agents are deemed not to have complied with the EMPr and remedial action if:

- There is evidence of a contravention of the EMPr clauses within the boundaries of the site or extensions;
- Environmental damage ensues due to negligence; and
- The Developer fails to comply with corrective or other instructions issued by the PM, within a time period specified by the PM.

## 10.2 Implementation of Corrective Action

Checking and corrective action forms part of the environmental management function and is aimed at ensuring that the necessary environmental management activities are being implemented and that the desired outcomes are achieved. When non-conformities do occur that have a negative impact on the environment, these should be rectified by the implementation of corrective actions issued by the PM, in consultation with the ECO, within a reasonable or agreed period of time. All corrective actions need to be documented and the outcome photographed and included in the next report. Broadly, the mechanisms for addressing non-compliance that are provided for in the environmental specifications and associated contract documentation can be divided into the following categories:

- Controlling performance via the certification of payments;
- Requiring the Project Manager to “make good”, at their own cost, any unjustifiable environmental degradation;
- Implementing a system of penalties to dissuade environmentally risky behaviours;
- Removing environmentally non-compliant staff/ plant from the site, or suspending part or all of the activities on-site;

## 10.3 Environmental Contact Person

Contact Person	Mr. Sello Lebeko
Designation	Project Manager (Capex)
Telephone	011 712 5200
E-mail	sellolebeko@pikitup.co.za

## 10.4 Emergency Numbers

- Police: 10111
- Ambulance 10177
- Netcare 911 082 911
- ER24 084 124
- Crimestop 08600 10 111

## **11 REFERENCES**

A. Bootsma, 2022. Proposed Upgrade of the Waste Management Facility at Linbro Park, Johannesburg, Gauteng Province, Limosella Consulting Report Ref: Linbro\_ Aquatic Report-2022.05.15, Final Version.

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## **APPENDIX A: EAP CVs**

## **APPENDIX B: Stormwater Management Plan**

