

**APPENDIX H: EMPR**



**Prepared for:**  
Ekurhuleni Metropolitan Municipality



**Contact person:**  
Ms Nathalie Smal

**Tel:** (011) 999 3960  
**Email:** Nathalie.Smal@ekurhuleni.gov.za



## WITFIELD STORMWATER NETWORK AND ATTENUATION POND

### ENVIRONMENTAL MANAGEMENT PROGRAMME

DRAFT REPORT  
REVISION 00

**AUGUST 2016**



**Prepared by:**  
Delta Built Environment Consultants (Pty) Ltd

**Contact person:**  
Gerhard Schoeman

**Tel:** (012) 368 1850  
**Fax:** (012) 348 4738  
**Email:** gerhard.schoeman@deltabec.com



## DOCUMENT CONTROL

<b>TITLE:</b>	ENVIRONMENTAL MANAGEMENT PROGRAMME		
<b>ELECTRONIC FILE LOCATION:</b>	P15099_REPORTS_05.BAR_2. DRAFT BAR - EMPr REV00		
<b>REPORT STATUS:</b>	Draft		
<b>REVISION NUMBER:</b>	00		
<b>CLIENT:</b>	Ekurhuleni Metropolitan Municipality Corner of Pretoria Road and CR Swart Drive Kempton Park Civic Centre P.O. Box 13 Kempton Park 1620		
<b>CONSULTANT:</b>	Delta Built Environment Consultants (Pty) Ltd P.O. Box 35703 Menlo Park 0102		
<b>DATE:</b>	August 2016		
<b>REFERENCE NUMBER:</b>	P15099 / R 3786		
<b>PREPARED BY:</b>	Jana Steyn	Environmental Analyst	
<b>REVIEWED BY:</b>	Gerhard Schoeman	Senior Environmental Analyst	
	Roelien du Plessis	Environmental Assessment Practitioner	
<b>APPROVED BY:</b>	Nathalie Smal	Ekurhuleni Metropolitan Municipality	
<b>DISTRIBUTION LIST:</b>	<b>COMPANY</b>	<b>NAME &amp; SURNAME</b>	
	Ekurhuleni Metropolitan Municipality	Nathalie Smal	
	Delta Built Environment Consultants	Louis Fourie	

## RECORD OF REVISIONS

REV. NO.	STATUS	DESCRIPTION OF REVISION	REV. DATE
00	Draft	Issued for comments	19 August 2016

## EXECUTIVE SUMMARY

Delta Built Environment Consultants (BEC) was appointed by the Ekurhuleni Metropolitan Municipality (EMM) for the design and implementation of the Witfield stormwater network and attenuation pond.

The EMM expressed its intention to implement a stormwater management plan to prevent flooding in low-lying areas in the Witfield project area. The proposed development will entail:

- The construction of an attenuation pond of approximately 20 000 m<sup>3</sup> will be constructed on Erf 199 to control the discharge rate into the existing system. This would accommodate the northern catchment area.
- A new stormwater network will be constructed downstream of the N12 in both Edward Street and Pitout streets, respectively. This will be a parallel line to cater for the catchment areas downstream of the N12 and thus alleviate the pressure on the existing culvert. This method will divide the northern and southern catchment areas to assign the northern catchment to the existing culvert system and the southern catchment to the new pipe networks. The pipe network will in all likelihood be constructed within the surfaced road to avoid conflict with existing services.
- Implement a stormwater solution that would alleviate pressure on the current culvert system, and in so doing, mitigate the extent of flooding of low-lying properties in the Witfield area.

The draft Environmental Management Programme (EMPr) is published in conjunction with the draft Basic Assessment Report (BAR) for public comment. Once the public has provided comments on the draft BAR and EMPr the comments received will be incorporated as required and be submitted to the Gauteng Department of Agriculture and Rural Development (GDARD).

The approved BAR and EMPr will detail the environmental conditions to be adhered to during the construction phase of the Witfield stormwater network and attenuation pond.

The final EMPr must be considered during pre-construction planning and design, and incorporated in all the contractor documents, and fully implemented prior to the commencement of any construction activities.

The EMPr may also require further amendments as the project unfolds. Any significant amendments require GDARD approval before being implemented.

## TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY .....</b>	<b>3</b>
<b>1 INTRODUCTION .....</b>	<b>6</b>
1.1 PROJECT BACKGROUND .....	6
1.2 TERMS AND DEFINITIONS .....	6
1.3 STRUCTURE OF REPORT .....	7
<b>2 PROJECT OVERVIEW .....</b>	<b>8</b>
2.1 PROJECT DESCRIPTION .....	8
<b>3 DESCRIPTION OF THE RECEIVING ENVIRONMENT .....</b>	<b>10</b>
3.1.1 BIODIVERSITY ASPECTS .....	10
3.1.1.1 Terrestrial Fauna .....	10
3.1.1.2 Terrestrial Vegetation .....	10
3.1.1.3 Wetlands .....	11
3.1.1.4 Aquatic Ecosystem: Elsburgspruit .....	11
3.1.2 CULTURAL AND HERITAGE ASPECTS .....	12
3.1.3 PALAEOLOGICAL ASPECTS .....	12
<b>4 ORGANISATION STRUCTURE, ROLES AND RESPONSIBILITIES .....</b>	<b>14</b>
4.1 ORGANISATIONAL STRUCTURE .....	14
4.2 ROLES AND RESPONSIBILITIES .....	14
<b>5 LEGISLATION AND POLICY CONTEXT .....</b>	<b>17</b>
<b>6 METHOD STATEMENTS .....</b>	<b>23</b>
6.1 METHOD STATEMENTS .....	23
6.1.1 METHOD STATEMENT PROCEDURE .....	23
6.2 METHOD STATEMENTS TO BE DEVELOPED .....	24
<b>7 ENVIRONMENTAL MANAGEMENT PROGRAMME TO ADDRESS SPECIFIC ASPECTS AND IMPACTS .....</b>	<b>27</b>
7.1 SITE ESTABLISHMENT AND DEMARCATION .....	28
7.2 WETLAND .....	29
7.2.1 EXCAVATIONS OF ATTENUATION POND AND NEW OUTLET .....	29
7.2.2 CONSTRUCTION ACTIVITIES .....	29
7.2.3 STORMWATER MANAGEMENT .....	30
7.3 AQUATIC ECOSYSTEMS (RIVERS AND WETLAND) .....	30
7.3.1 DECREASED WATER QUALITY .....	30
7.3.2 DETERIORATION OF HABITAT QUALITY .....	30
7.4 TERRESTRIAL FAUNA .....	31
7.5 TERRESTRIAL VEGETATION .....	31
7.5.1 LOSS OF PLANT SPECIES DUE TO VEGETATION CLEARING .....	31
7.5.2 EXPOSURE OF THE SOIL TO EROSION .....	32
7.5.3 SPREAD OF ALIEN INVASIVE VEGETATION .....	32
7.5.4 SOIL COMPACTION AND SUBSEQUENT DISTURBANCE OF THE SOIL SEEDBANK .....	32
7.6 PALEONTOLOGICAL RESOURCES .....	32
7.7 CULTURAL HERITAGE RESOURCES .....	33
7.8 WASTE MANAGEMENT .....	33
7.9 AIR QUALITY .....	34
7.9.1 DUST .....	35
7.9.2 NOISE .....	35

7.10	HEALTH AND SAFETY.....	35
7.11	PRIVATE/ PUBLIC SERVICE INFRASTRUCTURE.....	36
7.12	TRAFFIC MANAGEMENT .....	36
<b>8</b>	<b>ENVIRONMENTAL AWARENESS.....</b>	<b>38</b>
8.1	TRAINING .....	38
8.2	CONTINUOUS AWARENESS.....	38
<b>9</b>	<b>COMPLIANCE MONITORING AND REPORTING .....</b>	<b>39</b>
<b>10</b>	<b>COMPLIANCE WITH EMPR .....</b>	<b>40</b>
10.1	NON-COMPLIANCE.....	40
<b>11</b>	<b>CONCLUSION.....</b>	<b>41</b>
<b>APPENDIX A:</b>	<b>RECORD OF REVISIONS.....</b>	<b>42</b>
<b>APPENDIX B:</b>	<b>COMPLAINT REGISTER.....</b>	<b>43</b>
<b>APPENDIX C:</b>	<b>INCIDENT REGISTER .....</b>	<b>44</b>
<b>APPENDIX D:</b>	<b>TRAINING REGISTER.....</b>	<b>50</b>
<b>APPENDIX E:</b>	<b>SITE LAYOUT PLAN .....</b>	<b>51</b>
<b>APPENDIX F:</b>	<b>CONSTRUCTION PROGRAMME.....</b>	<b>52</b>

## LIST OF FIGURES

Figure 2-1	Locality of the proposed stormwater network and attenuation pond.....	8
Figure 3-1	Delineated wetlands .....	11
Figure 4-1	Organisational Hierarchy .....	14
Figure 6-1	Review and Approval of Method Statement .....	24

## LIST OF TABLES

Table 6-1	Method statements to be developed	24
-----------	-----------------------------------	----

# 1 INTRODUCTION

## 1.1 PROJECT BACKGROUND

The draft Environmental Management Programme (EMPr) has been developed as part of the Basic Assessment (BA) process for the Witfield stormwater network and attenuation pond. The draft EMPr follows the Basic Assessment Report (BAR), stipulating the measures for mitigation of impacts that were identified during the BA.

The main purpose of this document is to:

- Describe how project environmental risk will be managed during the different project phases.
- Detail the roles and responsibilities of all parties with respect to environmental management for the duration of the project.
- Outline the organisational structure for effective implementation of the EMPr.
- Assist the Contractor in understanding the requirements of complying with the EMPr.
- Provide a set of standards for environmental management during the different project phases.

The findings, mitigation and management measures stipulated in the specialist studies were taken into account during the development of the draft EMPr. The respective specialist studies include:

- Biodiversity Assessment
- Palaeontological Impact Assessment
- Cultural Heritage Statement

## 1.2 TERMS AND DEFINITIONS

TERM	DEFINITION
<b>BA</b>	Basic Assessment
<b>BAR</b>	Basic Assessment Report
<b>Client</b>	For the proposed Rietspruit Outfall Sewer Pipeline project, Ekurhuleni Metropolitan Municipality is the client.
<b>Contractor</b>	The principle contractor as engaged by Ekurhuleni Metropolitan Municipality for infrastructure construction operations, including all Subcontractors appointed by the main contractor of his own volition for the execution of parts of the construction operations.
<b>Construction Manager</b>	Works together with the project manager to ensure that construction proceeds in accordance with the relevant specifications and deadlines.

TERM	DEFINITION
<b>Contractor's Environmental Officer</b>	The contractor's environmental officer is responsible for ensuring compliance with the EMPr on a daily basis.
<b>Delta BEC</b>	Delta Built Environment Consultants
<b>EA</b>	Environmental Authorisation
<b>EMM</b>	Ekurhuleni Metropolitan Municipality
<b>EMPr</b>	Environmental Management Programme
<b>Environment</b>	Surroundings in which the contractor operates, including air, water, land, natural resources, flora, fauna, humans, and their interrelations.
<b>Environmental Aspect</b>	Elements of a contractor's activities, products or services that can interact with the environment and cause an environmental impact (e.g. dust, noise).
<b>Environmental Impact</b>	Any change to the environment, whether adverse or beneficial, wholly or partially resulting from a contractor's activities, products or services.

### 1.3 STRUCTURE OF REPORT

The report comprises the following sections:

- Section 3: Description of the receiving environment
- Section 4: Organisation Structure, Roles and Responsibilities
- Section 5: Legislation and Policy Context
- Section 6: Method Statements
- Section 7: Environmental Management Programme to address specific aspects and impacts
- Section 8: Environmental Awareness
- Section 9: Compliance Monitoring and Reporting
- Section 10: Compliance with the EMPr
- Section 11: Conclusion
- Appendix A: Record of revision
- Appendix B: Complaints Register
- Appendix C: Incident Register
- Appendix D: Training Register
- Appendix E: Site Layout Plan
- Appendix F: Construction Programme.



## 2 PROJECT OVERVIEW

An overview of the project activity is presented under this section.

### 2.1 PROJECT DESCRIPTION

Witfield is a suburb of Boksburg which is situated on the East Rand in the Gauteng Province of South Africa. The project location is situated south of the M44 and runs down up to the discharge point just north of the Witfield dam. The below figure illustrated the locality of the Witfield stormwater network and attenuation pond.

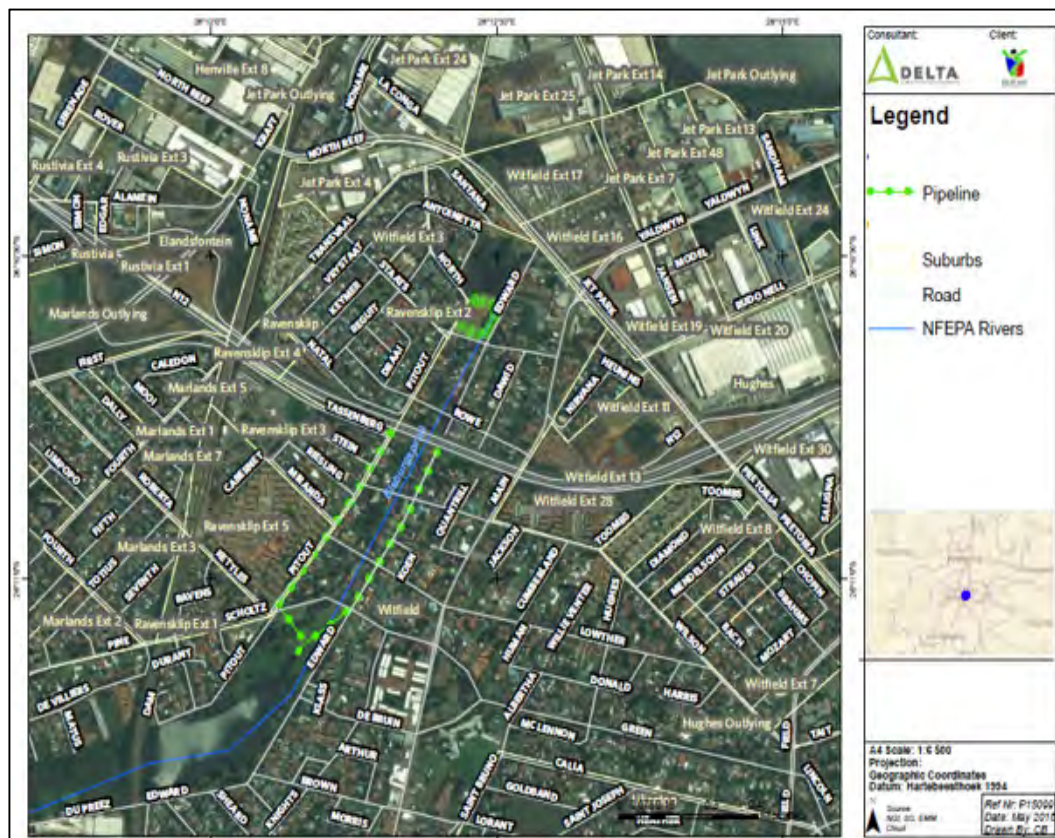


Figure 2-1 Locality of the proposed stormwater network and attenuation pond

The EMM expressed its intention to implement a stormwater management plan to ensure low-lying areas in the Witfield area aren't flooded during certain storm events.

The construction of an attenuation pond of approximately 20 000 m<sup>3</sup> will be constructed on Erf 199 to control the discharge rate into the existing system. This would accommodate the northern catchment area.

A new stormwater network will be constructed downstream of the N12 in both Edward Street and Pitout streets, respectively. This will be a parallel line to cater for the catchment areas downstream of the N12 and thus alleviate the pressure

on the existing culvert. This method will divide the northern and southern catchment areas to assign the northern catchment to the existing culvert system and the southern catchment to the new pipe networks. The pipe network will in all likelihood be constructed within the surfaced road to avoid conflict with existing services.

## 3 DESCRIPTION OF THE RECEIVING ENVIRONMENT

This section provides a summary of the findings of the impact assessments and the specialist studies that was conducted in June 2016, which comprises a biodiversity study, a palaeontological impact assessment and a cultural heritage statement.

### 3.1.1 BIODIVERSITY ASPECTS

#### 3.1.1.1 Terrestrial Fauna

##### 3.1.1.1.1 Birds

During the field survey diversity was low with very few faunal species observed. Observed species included common bird species only.

##### 3.1.1.1.2 Mammals

Based on the assessment, the following three (3) mammal species of conservation concern could potentially be present at the project area.

- *Chrysospalax villosus* (Rough-haired golden mole)
- *Lutra maculicollis* (Spotted-necked otter)
- *Dasymsus incomtus* (African marsh rat)

The probability of occurrence of these species was assessed based on factors such as habitat preference, distributional range and sensitivity to disturbance. Given the degree of disturbance and the location of the site at the margin of this species' distribution the likelihood of occurrence is rated as unlikely.

##### 3.1.1.1.3 Invertebrates

The following two (2) invertebrate species of concern may potentially occur in the project area.

- *Lepidochryso praeterita* (Highveld Blue Butterfly)
- *Chrysochrysis aureus* (Heidelberg Copper Butterfly)

The assessment rated the species as unlikely to occur in the project area.

#### 3.1.1.2 Terrestrial Vegetation

The proposed project area is situated within the Grassland Biome of southern Africa, more specifically the Soweto Highveld Grassland (Gm8), however very little of the original grassland remains in the project area. Based on the terrestrial vegetation the sensitivity of the vegetation communities ranged from medium to low. The entire property (Erf 199 of Township Witfield) will not be disturbed by the development of the attenuation pond. There will still be veldt adjacent to the development to accommodate species.

Refer to section 7 – EMPr to address specific terrestrial vegetation aspects and impacts.

### 3.1.1.3 Wetlands

The wetland systems were found to be in a seriously modified (Category E) state, suggesting the change in ecosystem processes and loss of natural habitat and biota is great but some remaining natural habitat features are still recognizable. Noticeable modifications to the systems include the following:

- The development of the area which has resulted in watercourse corridors lost and the hydrology of the systems managed by stormwater systems, and the structure of the channels lost.
- Increased stormwater and run-off inputs from the surrounding urban developments and access routes.
- Manicured recreational areas and mowing of open areas adjacent to the wetlands.
- The construction of dams, above and below the project area have also contributed to altered flow dynamics across the system.



Figure 3-1 Delineated wetlands

Refer to section 6 – EMPr to address specific wetland aspects and impacts.

### 3.1.1.4 Aquatic Ecosystem: Elsburgspruit

The Present Ecological Status (PES) category of the reach was found to be in a seriously modified (Class E) state. The Ecological Importance (EI) of the reach was rated as moderate. The factors that contributed to the moderate EI include:

- Low importance of riparian and wetland in stream vertebrates (excluding fish).
- Moderate habitat diversity.
- Low in stream habitat integrity.
- Low riparian and wetland habitat integrity.
- High importance of natural riparian and wetland vegetation.

The Ecological Sensitivity (ES) of the reach is classified as moderate. The factors that contributed to this included the following.

- High sensitivity of fish communities to modification of water quality.
- Moderate sensitivity of aquatic macro invertebrate communities to modified water quality.
- High sensitivity of both fish and aquatic macro invertebrate communities to lack of flow.
- Low stream size sensitivity to modified flow.

Refer to section 6 – EMPr to address specific aquatic ecosystem aspects and impacts.

### **3.1.2 CULTURAL AND HERITAGE ASPECTS**

J van Schalkwyk, the heritage consultant who conducted the desk-top investigation of the study area, stated in the Cultural Heritage Statement that the area has a low possibility for heritage sites, especially dating to the pre-colonial area. As a result of the dense urbanisation and the fact that houses were built over the canal, any heritage sites or features that might have occurred here in the past, would have been destroyed.

Should archaeological sites or graves be exposed during construction activities, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.

Refer to section 6 – EMPr to address specific cultural and heritage aspects and impacts.

### **3.1.3 PALAEOLOGICAL ASPECTS**

The desktop Palaeontological Impact Assessment undertaken by the Palaeologist, Professor Marion Bamford stated that there is very little likelihood of any fossils of scientific interest being found during the excavation for stormwater drainage because the rocks are mostly much too old to contain any fossils.

According to the specialist, some outcrops of Dwyka Group and Vryheid Formation that could possibly contain plant fossils but as the surface has been highly disturbed by the urban development and periodic flooding, the likelihood of finding fossils of any scientific value is extremely small.

If any fossils are found once excavation has begun, a palaeontologist should be called to assess their value and make a representative collection.

Refer to section 6 – EMPr to address specific palaeontological aspects and impacts.



## 4 ORGANISATION STRUCTURE, ROLES AND RESPONSIBILITIES

### 4.1 ORGANISATIONAL STRUCTURE

The organisational structure, as per figure below illustrates the responsibilities and authority regarding environmental matters.

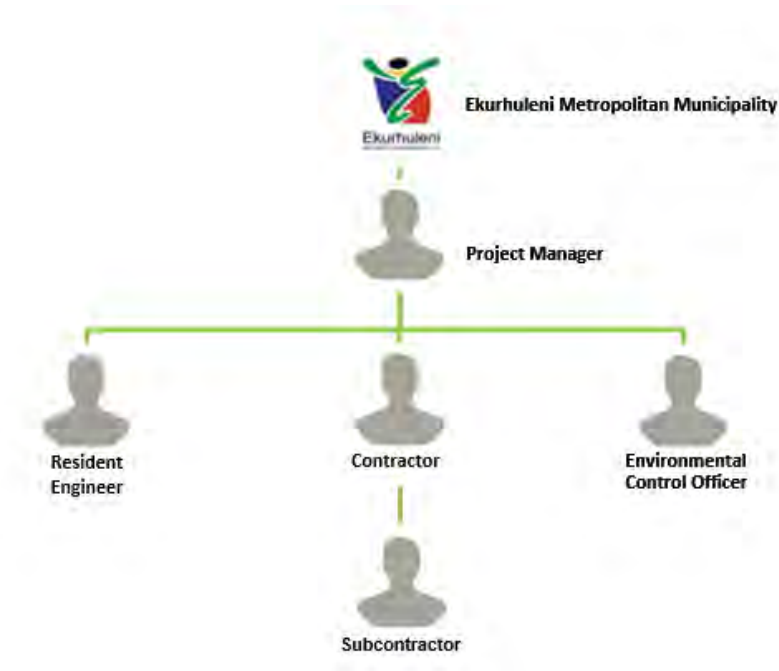


Figure 4-1 Organisational Hierarchy

### 4.2 ROLES AND RESPONSIBILITIES

The roles and responsibilities of the aforementioned are presented in the below table.

Roles	Responsibilities
<b>EMM</b>	<p>The EMM will be responsible for the overall implementation, administration and enforcement of the EMPr. The municipality shall:</p> <ul style="list-style-type: none"> <li>• Ensure that the EMPr specifications are included in all tender documents issued for the development works and activities on site, and shall ensure that the prospective Tenders / Contractors abide by the provisions thereof.</li> <li>• Monitor the implementation of and compliance with the EMPr for the duration of the works.</li> </ul>

Roles	Responsibilities
	<ul style="list-style-type: none"> <li>• Be liable / accountable, to the relevant authority, for any contravention / noncompliance by any Contractor under their supervision.</li> <li>• Appoint an ECO to monitor, review and verify compliance with the EMPr.</li> <li>• Through the RE, issue fines or stop works orders for contravention of the EMPr and give instructions regarding corrective action.</li> </ul>
<b>Project Manager</b>	<p>The project manager is responsible for managing the contract and monitoring the activities of the relevant contractors during construction.</p> <p>The project manager will:</p> <ul style="list-style-type: none"> <li>• Ensure that the contractor is duly informed of the EMPr and associated responsibilities and implications of this EMPr prior construction takes place.</li> <li>• Monitor the contractors' activities with the resident engineer to ensure compliance with the requirements outlined in the EMPr.</li> <li>• Ensure that non-compliance is remedied to the satisfaction of the relevant authorities.</li> <li>• Ensure all environmental monitoring programmes are carried out according to protocols and schedules.</li> </ul>
<b>Environmental Control Officer (ECO)</b>	<p>The ECO will be responsible for monitoring, reviewing and verifying compliance with the EMPr by the Contractor. In particular, the ECO shall:</p> <ul style="list-style-type: none"> <li>• Comply with the contents of this document as well as with the EMPr specifications in the contract document to ensure that the requirements of the EMPr are met.</li> <li>• Visit / inspect the site regularly, to ascertain the level of compliance of works.</li> <li>• Ensure that necessary environmental authorisations and permits have been obtained.</li> <li>• Review and approve construction method statements.</li> <li>• Assist the contractor in finding environmentally responsible solutions to problems.</li> </ul> <ul style="list-style-type: none"> <li>• Maintain a photographic record of the site before, during and after construction.</li> <li>• Monitor and verify that the EMPr is adhered to at all times and take action if the specifications are not followed.</li> </ul>
<b>Contractor</b>	<p>The contractor shall:</p>



Roles	Responsibilities
	<ul style="list-style-type: none"> <li>• Ensure that the environmental specifications contained in the EMPr and EA are effectively implemented. This includes the on-site implementation of steps to mitigate environmental impacts.</li> <li>• Ensure that all employees and co-contractors employed comply with the requirements and provisions of the EMPr and EA.</li> <li>• Monitor environmental performance and conformance with the specifications contained in this document during internal compliance monitoring.</li> <li>• Discuss implementation of and compliance with the EMPr and EA with staff at routine site meetings.</li> </ul> <hr/> <ul style="list-style-type: none"> <li>• Report progress towards implementation and all non-compliances with the EMPr and EA at site meetings.</li> <li>• Notify the ECO of the detailed anticipated programme of works to take place.</li> <li>• Ensure all required records are kept and all documentation is available at all times at the site office.</li> <li>• Notify the ECO of all incidents, accidents and transgressions on site with respect to the environmental management as well as the requirements of the EMPr.</li> </ul>

## 5 LEGISLATION AND POLICY CONTEXT

Legislation of all the spheres of government must be strictly enforced during all the phases of the project, irrespective of whether they are addressed in this EMPr.

The client, project manager, contractor, subcontractor, residential engineer and ECO of the proposed Witfield Stormwater network and attenuation pond must be acquainted with the relevant environmental legislation, including provincial and local government regulations, policies and guidelines which are in place to ensure the protection of the environment. The environmental legislation applicable to the project includes, but is not limited to, the following:

LEGISLATION	DESCRIPTION
<p>National Environmental Management Act, 1998 (Act No. 107 of 1998 as amended)</p>	<p>The NEMA EIA Regulations, 2014 list activities which require environmental assessment and authorisation prior to construction. These activities are known as 'listed activities', and must be authorised by the Gauteng Department of Agriculture and Rural Development.</p> <p>The applicable listed activities in the listing notices include the following:</p> <ul style="list-style-type: none"> <li>• Listing Notice 1 (GN R.983) Activity 13: The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs with a combined capacity of 50 000 cubic metres or more.</li> <li>• Listing Notice 1 (GN R.983) Activity 19: The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from a watercourse.</li> <li>• Listing Notice 3 (GN R.985) Activity 12: The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous is required for maintenance purposes undertaken in accordance with a maintenance management plan - Within critical biodiversity areas identified in bioregional plans.</li> </ul>

LEGISLATION	DESCRIPTION
	<ul style="list-style-type: none"> <li>• Listing Notice 3 (GN R.985) Activity 14: The development of –               <ul style="list-style-type: none"> <li>(i) Canals exceeding 10 square metres in size.</li> <li>(ii) Channels exceeding 10 square metres in size.</li> <li>(iv) Dams, where the dam, including infrastructure and water exceeds 10 square metres in size.</li> <li>(vi) Bulk stormwater outlet structures exceeding 10 square metres in size.</li> <li>(xii) Infrastructure or structures with a physical footprint of 10 square metres or more.</li> </ul> <p>Where such development occurs –</p> <ul style="list-style-type: none"> <li>(a) Within a watercourse;</li> <li>(c) If no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse.</li> </ul> <p>(b) In Gauteng</p> <ul style="list-style-type: none"> <li>iv. Sites identified as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans.</li> </ul> </li> </ul> <p>GN R.985 Activity 23: The expansion of–</p> <ul style="list-style-type: none"> <li>(v) Canals exceeding 10 square metres in size.</li> <li>(vi) Channels exceeding 10 square metres in size.</li> <li>(vi) Dams, where the dam, including infrastructure and water exceeds 10 square metres in size.</li> <li>(vii) Bulk stormwater outlet structures exceeding 10 square metres in size.</li> <li>(xii) Infrastructure or structures with a physical footprint of 10 square metres or more.</li> </ul>

LEGISLATION	DESCRIPTION
	<p>Where such development occurs –</p> <ul style="list-style-type: none"> <li>(a) Within a watercourse;</li> <li>(c) If no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse.</li> <li>(b) In Gauteng <ul style="list-style-type: none"> <li>iv. Sites identified as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans.</li> </ul> </li> </ul>
National Water Act, 1998 (Act No. 36 of 1998)	To provide for fundamental reform of the law relating to water resources; to repeal certain laws, and to provide for matters connected therewith.
National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)	To reform the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development; to provide for institutional arrangements and planning matters; to provide for national norms and standards for regulating the management of waste by all spheres of government; to provide for specific waste management measures; to provide for the licensing and control of waste management activities; to provide for the remediation of contaminated land; to provide for the national waste information system; to provide for compliance and enforcement; and to provide for matters connected therewith.
National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)	To provide reasonable measures for the protection and enhancement of the quality of air in the Republic; the prevention of air pollution and ecological degradation; and securing ecologically sustainable development while promoting justifiable economic and social development.

LEGISLATION	DESCRIPTION
National Heritage Resources Act, 1999 (Act No. 25 of 1999)	To set norms and maintain essential national standards for the management of heritage resources and to protect heritage resources of national significance.
Ekurhuleni Metropolitan Municipality Storm Water By-Laws	<p>The purpose of these By-laws is to manage, control and regulate the quantity, quality, flow and velocity of storm water runoff from any property which it is proposed to develop or is in the process of being developed or is fully developed, in order to prevent or mitigate –</p> <ul style="list-style-type: none"> <li>• erosion and degradation of watercourses.</li> <li>• sedimentation in ponds and watercourses.</li> <li>• degradation of water quality and fish habitat.</li> <li>• excess storm water runoff onto a public road which may pose a danger to life or property or both.</li> </ul>
The Constitution of the Republic of South Africa Act, 1996 (Act No. 108 of 1996)	Section 24 places people and their needs at the forefront of environmental management. The Constitution provides a right to “an environment that is not harmful to human health or well-being” and to have the environment protected, for the benefit of present and future generations, through reasonable legislative measures. These measures include the prevention of pollution and ecological degradation, the promotion of conservation, the securing of ecologically sustainable development and the utilization of natural resources while promoting justifiable economic and social development.

LEGISLATION	DESCRIPTION
GN. R 982, NEMA Environmental Impact Assessment Regulations, 2014	The purpose of these Regulations is to regulate the procedure and criteria as contemplated in Chapter 5 of the Act relating to the preparation, evaluation, submission, processing and consideration of, and decision on, applications for EA for the commencement of activities, subjected to environmental impact assessment, in order to avoid or mitigate detrimental impacts on the environment, and to optimise positive environmental impacts, and for matters pertaining thereto.
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	To provide for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998; the protection of species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bio prospecting involving indigenous biological resources; the establishment and functions of a South African National Biodiversity Institute; and for matters connected therewith.
Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) and National building Regulations and Building Act (No. 103 of 1997).	To provide for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and 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; to establish an advisory council for occupational health and safety; and to provide for matters connected therewith.
Gauteng Conservation Plan Version 3.3 (C-Plan 3.3)	The main purposes of C-Plan 3.3 are to serve as the primary decision support tool for the biodiversity component of the Environmental Impact Assessment (EIA) process; to inform protected area expansion and biodiversity stewardship programmes in the province; to serve as a basis for development of Bioregional Plans in municipalities within the province.

LEGISLATION	DESCRIPTION
The Gauteng Draft Red Data Policy	The primary purpose of the Draft Red Data Policy is to protect red data plant species in Gauteng Province.
Gauteng Policy on Protection of High Potential Agricultural Land	To provide for control over the utilization 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.

## 6 METHOD STATEMENTS

### 6.1 METHOD STATEMENTS

The contract will require method statements to be compiled to indicate in detail how compliance will be achieved with environmental legislation, good environmental management practices and environmental requirements stipulated in the EMPr, during the design, construction and rehabilitation phase. Method Statements may be required for any identified activities for which it is considered a requirement to implement a detailed method to mitigate potential environmental impacts. In addition to the method statements identified in this EMPr, the client, contractor, project manager and/or ECO may require additional method statements for effective environmental management as the project progresses.

#### 6.1.1 METHOD STATEMENT PROCEDURE

The method statements should provide a step by step description in order for the project manager and ECO to understand the contractor's proposed actions.

Method statements should indicate the following:

- **What:** A description of the work to be undertaken.
- **How:** A description of the process of work, methods and materials to be used.
- **When:** An estimate of the commencement and end dates.
- **Who:** The people that will be undertaking the activity.

The method statement should also detail the control measures that will be put in place to ensure correct environmental management.

The contractor will submit the written method statement to the project manager at least 14 working days prior to the commencement of work on an activity, to allow the project manager and ECO sufficient time to study and approve the method statement, as indicated in the figure below.



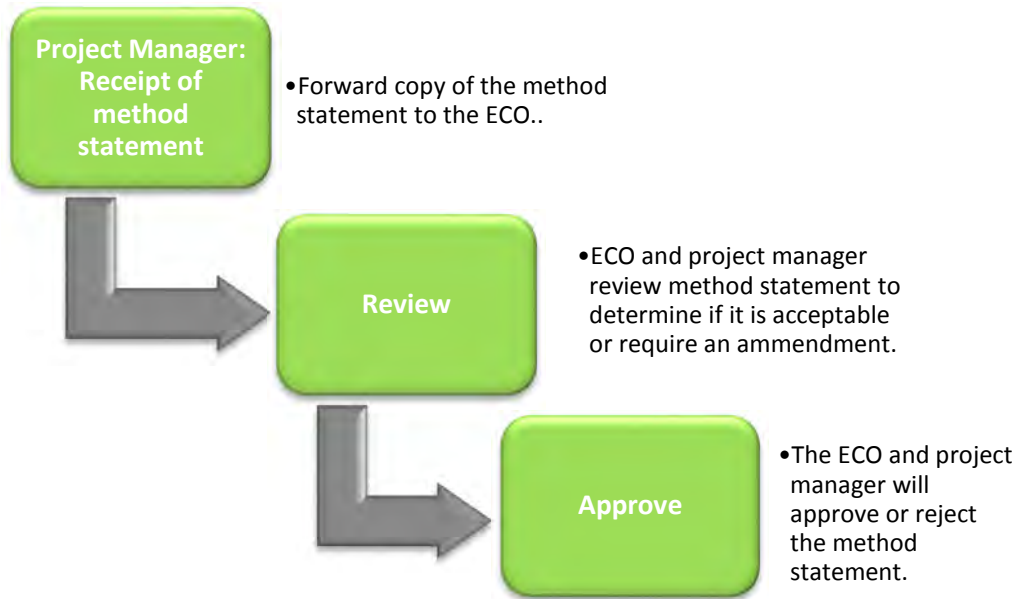


Figure 6-1 Review and Approval of Method Statement

The ECO and the project manager shall approve the method statement within seven (7) working days of receipt. An approved method statement is seen as a binding document, and the contractor must therefore ensure that all activities to which the approved method statement applies are carried out as stipulated. Should there be a change in circumstances, and the modification of a method statement is required, the changes and modifications will need to be reviewed and approved by the project manager and ECO.

A revised method statement may only be implemented once written approval has been obtained from the project manager and ECO.

## 6.2 METHOD STATEMENTS TO BE DEVELOPED

The following method statements must be developed by the contractor. Reference must be made to section 6 of the EMPr.

Table 6-1 Method statements to be developed

ACTIVITY	REQUIREMENTS
<p><b>Site Establishment</b></p>	<ul style="list-style-type: none"> <li>- Layout and preparation of the site camp.</li> <li>- Layout indicating positions for the following:                             <ul style="list-style-type: none"> <li>▪ All storage areas</li> <li>▪ Stockpiling areas</li> <li>▪ Hazardous Chemical Storage Areas</li> <li>▪ Access routes and paths</li> <li>▪ Demarcation of “No-Go” Areas</li> <li>▪ Ablutions and eating facilities</li> <li>▪ Other infrastructure.</li> </ul> </li> <li>- Method of informing public of construction.</li> <li>- Method of handling complaints received from the public.</li> </ul>




ACTIVITY	REQUIREMENTS
<b>Wetland</b>	<ul style="list-style-type: none"> <li>- Methods to reduce erosion potential of excavated and exposed surfaces.</li> <li>- Methods of hazardous chemical substance spill and leak containment.</li> <li>- Methods of disposal of hazardous chemical spill clean-up.</li> <li>- Provision and maintenance of sanitary and ablution facilities.</li> </ul>
<b>Aquatic Ecosystems</b>	<ul style="list-style-type: none"> <li>- Methods of storing excavated soil.</li> <li>- Methods of cleaning equipment and construction plant.</li> <li>- Methods of construction plant and equipment maintenance, servicing and refuelling.</li> <li>- Methods to prevent spillages of lubricants, fuels and construction material runoff into aquatic ecosystems.</li> </ul>
<b>Terrestrial Fauna</b>	<ul style="list-style-type: none"> <li>- The methods to be used to educate staff regarding the prohibiting of the killing of any animal.</li> </ul>
<b>Terrestrial Vegetation</b>	<ul style="list-style-type: none"> <li>- Method of vegetation clearing.</li> <li>- Methods to protect cleared areas from erosion.</li> <li>- Method of rehabilitation of cleared areas.</li> </ul>
<b>Alien Invasive Vegetation</b>	<ul style="list-style-type: none"> <li>- Alien Invasive Vegetation species management and control programme.</li> </ul>
<b>Waste Management</b>	<ul style="list-style-type: none"> <li>- Location of designated waste areas.</li> <li>- Type of containers to be used for waste disposal.</li> <li>- On-site disposal facilities and collection arrangements.</li> <li>- Disposal procedures.</li> <li>- Methods of segregation, classification and labelling of waste streams.</li> <li>- Details of recordkeeping of disposal records obtained from the licensed landfill.</li> </ul>
<b>Dust</b>	<ul style="list-style-type: none"> <li>- Dust Control Programme.</li> </ul>
<b>Noise</b>	<ul style="list-style-type: none"> <li>- Noise Control Programme.</li> </ul>
<b>Health and Safety</b>	<ul style="list-style-type: none"> <li>- Compile Health and Safety file as per client specifications.</li> </ul>
<b>Private/ Public Service Infrastructure</b>	<ul style="list-style-type: none"> <li>- Private/ Public Service Infrastructure Management plan.</li> </ul>
<b>Security</b>	<ul style="list-style-type: none"> <li>- Site Security Management Plan.</li> </ul>
<b>Environmental Training</b>	<ul style="list-style-type: none"> <li>- Environmental Training Programme.</li> </ul>

ACTIVITY	REQUIREMENTS
<b>Traffic Management</b>	<ul style="list-style-type: none"> <li>- A Traffic Management Plan as per client specifications.</li> <li>- Methods for displaying signage on the construction site.</li> <li>- Methods for training flag persons to alert motorists and pedestrians of construction activities.</li> <li>- Any traffic diversions must be undertaken with the approval of the Municipality Transport Authority and in accordance with relevant legislation.</li> <li>- Method of informing the public of road closures.</li> </ul>
<b>Water Abstraction / Discharge</b>	<ul style="list-style-type: none"> <li>- Type of water sources to be used to obtain water for general construction activities.</li> <li>- Methods for providing staff with safe drinking water.</li> <li>- Methods of water discharge.</li> <li>- Protection measures to prevent rain from washing excavated materials into stormwater channels.</li> </ul>

## 7 ENVIRONMENTAL MANAGEMENT PROGRAMME TO ADDRESS SPECIFIC ASPECTS AND IMPACTS

This section covers the requirements for managing and controlling various specific aspects and environmental impacts of project related activities associated with the Witfield stormwater network and attenuation pond to ensure that impacts on the environment are appropriately mitigated. The specifications are based on the mitigation measures identified through the Basic Assessment process.

To provide for consistency and continuity in EMPr compliance throughout the project life-cycle and to minimise duplication of specifications, colour coded bars in the right margin indicate for which phase or phases of the development a specification applies as well as the relevant primary responsible party or parties:

<b>Planning and Design:</b>	Spans the pre-construction phase, including planning, contractor tendering and appointment, detail site surveys / investigations.	
<b>Construction:</b>	Spans the period from site demarcation for construction purposes up to the handover of the site to the applicant for main commissioning.	
<b>Rehabilitation:</b>	Spans the phase from the start of the main commissioning phase until rehabilitation and operation.	
<b>Method Statement:</b>	Indicates specifications that require an appropriate Method Statement to be developed, submitted for approval to the Project Manager (PM) (and accepted by the ECO) and thereafter implemented for effective implementation of the specification.	
<b>Specialist:</b>	The contractor must appoint a suitably qualified specialist as and when required to advise on and/or monitor specific environmental impacts and/or implementation of mitigation measures. For adherence to certain specifications referred to in Section 6, this might be compulsory.	

The specifications in this section have been organised and grouped in the following subsections:

- Site establishment and demarcation Section 7.1
- Wetland: Excavations of Attenuation Pond and Outlet Section 7.2.1
- Wetland: Construction Activities Section 7.2.2
- Wetland: Stormwater Management Section 7.2.3
- Aquatic Ecosystems: Decreased Water Quality Section 7.3.1
- Aquatic Ecosystems: Deterioration of habitat quality Section 7.3.2
- Terrestrial Fauna Section 7.4
- Terrestrial Vegetation: Loss of species due to vegetation clearing Section 7.5.1
- Terrestrial Vegetation: Exposure of the soil to erosion Section 7.5.2
- Terrestrial Vegetation: Spread of alien invasive vegetation Section 7.5.3
- Terrestrial Vegetation: Soil compaction Section 7.5.4
- Palaeontological Resources Section 7.6
- Cultural Heritage Resources Section 7.7
- Waste Management Section 7.8
- Air Quality: Dust Section 7.9.1
- Air Quality: Noise Section 7.9.2
- Health and Safety Section 7.10
- Public and Service Infrastructure Section 7.11
- Traffic Management Section 7.12

## 7.1 SITE ESTABLISHMENT AND DEMARCATION

MITIGATION – SITE ESTABLISHMENT AND DEMARCATION	Planning	Construction	Rehabilitation	RESPONSIBLE PARTY	FREQUENCY OF ACTION
7.1.1 The choice of the contractor’s camp requires the permission of the PM and ECO must ensure that the development footprint, site camp and associated areas, and access road take all the environmental characteristics of the site into account as indicated in section 2 and 7 of this EMPr.				- Contractor - ECO - PM	Prior to moving onto site.
7.1.2 Ensure that all “no go” areas are demarcated prior to construction.				- Contractor - ECO - PM	During site set up. As and when required.
7.1.3 Dedicate and demarcate suitable on-site areas for material, equipment, waste storage, stockpile areas in accordance with site layout plan prior to commencing with construction activities.				- Contractor - ECO - PM	During site set up. As and when required.
7.1.4 Inform the landowners of the proposed construction.				- Contractor - ECO - PM	During site set up. As and when required.

## 7.2 WETLAND

The proposed construction of the attenuation pond and new outlet presents a risk to the wetland systems, due to the excavations and associated activities required. Wetland habitats at the northern and southern extents of the project area will be lost as a result of the development.

### 7.2.1 EXCAVATIONS OF ATTENUATION POND AND NEW OUTLET

MITIGATION – WETLANDS	Planning	Construction	Rehabilitation	RESPONSIBLE PARTY	FREQUENCY OF ACTION
7.2.1.1 It is preferable that construction takes place during the dry season (if possible) to reduce the erosion potential of the exposed surfaces.				- Contractor - ECO - PM	On-going

### 7.2.2 CONSTRUCTION ACTIVITIES

MITIGATION – WETLANDS	Planning	Construction	Rehabilitation	RESPONSIBLE PARTY	FREQUENCY OF ACTION
7.2.2.1 The delineated wetland area must be avoided where possible. Refer to figure 3.1 for the map of the delineated wetland.				- Contractor - ECO - PM	On-going
7.2.2.2 Laydown yards, camps and storage areas must be established beyond the wetland and buffer areas.				- Contractor - ECO - PM	Prior to construction
7.2.2.3 Where possible, existing access routes and paths must be made use of, and new routes limited.				- Contractor - ECO - PM	On-going
7.2.3.4 Spill kits must be available to ensure that any fuel or oil spills are clean-up and discarded correctly.				- Contractor - ECO - PM	Prior to construction
7.2.3.5 Adequate sanitary facilities and ablutions on the servitude must be provided for all personnel.				- Contractor - ECO - PM	Prior to construction

### 7.2.3 STORMWATER MANAGEMENT

MITIGATION – WETLANDS	Planning	Construction	Rehabilitation	RESPONSIBLE PARTY	FREQUENCY OF ACTION
7.2.3.1 Prevent uncontrolled access of vehicles through wetlands that can cause a significant adverse impact on the hydrology and soil structure of these areas through rutting (which can act as flow conduits) and through the compaction of soils.				- Contractor - ECO - PM	On-going

### 7.3 AQUATIC ECOSYSTEMS (RIVERS AND WETLAND)

As the construction activities are situated in close proximity to aquatic ecosystems, there is potential for pollutants entering these systems. Potential sources include hydrocarbons and soils entering the system through surface runoff. As the proposed activities include excavations in order to construct the attenuation ponds there is potential for further sedimentation of the aquatic systems.

#### 7.3.1 DECREASED WATER QUALITY

MITIGATION – AQUATIC ECOSYSTEMS	Planning	Construction	Rehabilitation	RESPONSIBLE PARTY	FREQUENCY OF ACTION
7.3.1.1 No equipment may be washed within the watercourse, nor may dumping of construction material into drainage system takes place.				- Contractor - ECO - PM	On-going
7.3.1.2 Adequate sanitary facilities and ablutions on the servitude must be provided for all personnel.				- Contractor - ECO - PM	Prior to construction
7.3.1.3 No stormwater may be directed towards the watercourse without the installation and implementation of suitable pollution control facilities.				- Contractor - ECO - PM	Ongoing

#### 7.3.2 DETERIORATION OF HABITAT QUALITY

MITIGATION – AQUATIC ECOSYSTEMS	Planning	Construction	Rehabilitation	RESPONSIBLE PARTY	FREQUENCY OF ACTION
7.3.2.1 Construction activities and vehicles could cause spillages of lubricants,				- Contractor	As and when required.

MITIGATION – AQUATIC ECOSYSTEMS	Planning	Construction	Rehabilitation	RESPONSIBLE PARTY	FREQUENCY OF ACTION
fuels and construction material which could runoff into aquatic ecosystems. All vehicles and equipment must be maintained, and all refuelling and servicing of equipment are to take place in demarcated areas away from aquatic ecosystems.				- ECO - PM	

## 7.4 TERRESTRIAL FAUNA

The potential impacts on terrestrial fauna will include the loss of species of concern.

MITIGATION – TERRESTRIAL FAUNA	Planning	Construction	Rehabilitation	RESPONSIBLE PARTY	FREQUENCY OF ACTION
7.4.1. Prohibit the killing of any animals including snakes, lizards, birds or other animals.				- Contractor - ECO - PM	On-going

## 7.5 TERRESTRIAL VEGETATION

The potential impacts on terrestrial vegetation have been grouped into 4 main categories:

- Loss of plant species due to vegetation clearing.
- Exposure of the soil to erosion.
- Spread of alien invasive vegetation.
- Soil compaction and subsequent disturbance of the soil seed bank.

### 7.5.1 LOSS OF PLANT SPECIES DUE TO VEGETATION CLEARING

MITIGATION – TERRESTRIAL VEGETATION	Planning	Construction	Rehabilitation	RESPONSIBLE PARTY	FREQUENCY OF ACTION
7.5.1.1 Remove only the vegetation where essential for construction and do not allow any disturbance to the adjoining natural vegetation cover. The grassland can be removed as sods and re-established after construction is completed.				- Contractor - ECO - PM	As and when required



## 7.5.2 EXPOSURE OF THE SOIL TO EROSION

MITIGATION – TERRESTRIAL VEGETATION	Planning	Construction	Rehabilitation	RESPONSIBLE PARTY	FREQUENCY OF ACTION
7.5.2.1 Protect all areas susceptible to erosion (especially the sloped rocky grassland) and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas.				- Contractor - ECO - PM	As and when required
7.5.2.2 After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land must be left in a condition as close as possible to that prior to construction.				- Contractor - ECO - PM	Post-construction

## 7.5.3 SPREAD OF ALIEN INVASIVE VEGETATION

MITIGATION – TERRESTRIAL VEGETATION	Planning	Construction	Rehabilitation	RESPONSIBLE PARTY	FREQUENCY OF ACTION
7.5.3.1 Alien invasive species, in particular category 1 species that were identified within the study area should be removed from the development footprint and immediate surrounds, prior to soil disturbances. Refer to the Witfield Stormwater network and attenuation pond biodiversity assessment.  By removing these species, the spread of seeds will be prevented into disturbed soils which could thus have a positive impact on the surrounding natural vegetation.				- Contractor - ECO - PM	Prior to construction

## 7.5.4 SOIL COMPACTION AND SUBSEQUENT DISTURBANCE OF THE SOIL SEEDBANK

MITIGATION – TERRESTRIAL VEGETATION	Planning	Construction	Rehabilitation	RESPONSIBLE PARTY	FREQUENCY OF ACTION
7.5.4.1 Prohibit vehicular or pedestrian access into areas beyond the demarcated project footprint.				- Contractor - ECO - PM	On-going

## 7.6 PALEONTOLOGICAL RESOURCES

While it is possible that plant fossils occur in the proposed stormwater drainage or infrastructure area they will not be detected until excavations begin.

MITIGATION – PALEONTOLOGICAL RESOURCES	Planning	Construction	Rehabilitation	RESPONSIBLE PARTY	FREQUENCY OF ACTION
7.6.1 If fossil plant material is discovered, a professional palaeobotanist must be appointed to assess the importance of the material.				- Contractor - ECO - PM	As and when required.
7.6.2 Do not disturb these sites further until approval / permit has been obtained from SAHRA for the palaeobotanist to rescue the discovered fossil plant material.				- Contractor - ECO - PM	As and when required.
7.2.3 Ensure that all contractors and sub-contractors are made aware of the potential existence of palaeontological resources.				- Contractor - ECO - PM	During site set up.

## 7.7 CULTURAL HERITAGE RESOURCES

No impact on cultural heritage resources has been identified.

MITIGATION – CULTURAL HERITAGE RESOURCES	Planning	Construction	Rehabilitation	RESPONSIBLE PARTY	FREQUENCY OF ACTION
7.7.1 Inform a heritage practitioner immediately if any archaeological sites or graves are exposed during the construction activities.				- Contractor - ECO - PM	As and when required.
7.7.2 Do not disturb these sites further until approval / permit has been obtained from SAHRA.				- Contractor - ECO - PM	As and when required.
7.7.3 Ensure that all contractors and sub-contractors are made aware of the potential existence of cultural heritage resources.				- Contractor - ECO - PM	During site set up.

## 7.8 WASTE MANAGEMENT

Solid waste generated will mainly originate from excavation activities.

MITIGATION – WASTE MANAGEMENT	Planning	Construction	Rehabilitation	RESPONSIBLE PARTY	FREQUENCY OF ACTION
7.8.1 The management of waste must be in accordance with the stipulations of the municipal Solid Waste By-law (2002) and the Waste Act (2009).				- Contractor - ECO - PM	On-going

MITIGATION – WASTE MANAGEMENT	Planning	Construction	Rehabilitation	RESPONSIBLE PARTY	FREQUENCY OF ACTION
7.8.2 No littering is permitted and site clean-ups must regularly be undertaken.				- Contractor - ECO - PM	On-going
7.8.3 Sufficient weather and scavenger-proof containers shall be provided at the site camp for the disposal of solid waste.				- Contractor - ECO - PM	On-going
7.8.4 Waste and litter shall be disposed of into the bins to be provided, and must not be allowed to be blown off site.				- Contractor - ECO - PM	On-going
7.8.5 Ensure waste is segregated, classified and labelled at the source.				- Contractor - ECO - PM	On-going
7.8.6 The disposal of/burying waste on site shall not be permitted.				- Contractor - ECO - PM	On-going
7.8.7 Burning of waste shall not be permitted.				- Contractor - ECO - PM	On-going
7.8.8 Bins shall be emptied at least once weekly or more regularly if required.				- Contractor - ECO - PM	On-going
7.8.9 Waste shall be disposed of at a licensed landfill site				- Contractor - ECO - PM	On-going

## 7.9 AIR QUALITY

Construction phase may have a negative impact on the air quality. Dust will be generated from the movement of vehicles during the clearing of vegetation and throughout the construction phase of the development.

The movement of construction vehicles, construction activities and excavations equipment will generate noise during the construction phase of the development.

### 7.9.1 DUST

MITIGATION – AIR QUALITY	Planning	Construction	Rehabilitation	RESPONSIBLE PARTY	FREQUENCY OF ACTION
7.9.1 Construction vehicles speed should be reduced to reduce dust generation.				- Contractor - PM	As and when required.
7.9.2 Keep a complaints register at construction site to record all complaints received from the community.				- Contractor - ECO - PM	As and when required.

### 7.9.2 NOISE

MITIGATION – AIR QUALITY	Planning	Construction	Rehabilitation	RESPONSIBLE PARTY	FREQUENCY OF ACTION
7.9.2.1 Implement noise management plan to indicate how noise will be reduced.				- Contractor - ECO - PM	During site set up. As and when required.
7.9.2.2 Keep a complaints register at the construction site to record all complaints received from the community.				- Contractor - ECO - PM	As and when required.

### 7.10 HEALTH AND SAFETY

The construction of the stormwater network and attenuation pond pose a risk to the local public and employees, employed to perform construction work, due to unforeseen incidents and accidents.

MITIGATION – HEALTH AND SAFETY	Planning	Construction	Rehabilitation	RESPONSIBLE PARTY	FREQUENCY OF ACTION
7.10.1 Adequate signs must be placed in the area where construction will take place.				- Contractor - ECO - PM	During site set up. As and when required.
7.10.2 Plan construction operation in such a manner that the length of the excavated trenches remains open at a restricted minimum time.				- Contractor - ECO - PM	As and when required.
7.10.3 The length of an open trench at each work front shall not exceed 1000 m.				- Contractor - ECO - PM	As and when required.

MITIGATION – HEALTH AND SAFETY	Planning	Construction	Rehabilitation	RESPONSIBLE PARTY	FREQUENCY OF ACTION
7.10.4 The client, project management team and contractor must comply with the National Building Regulations and Building Act (No. 103 of 1997) and the Occupational Health and Safety Act (No.85 of 1993).				- Contractor - ECO - PM - Client	As and when required.

## 7.11 PRIVATE/ PUBLIC SERVICE INFRASTRUCTURE

The construction of the stormwater network and attenuation pond pose a risk to damage and disruption of unidentified service and public infrastructure.

MITIGATION – PRIVATE/ PUBLIC SERVICE INFRASTRUCTURE	Planning	Construction	Rehabilitation	RESPONSIBLE PARTY	FREQUENCY OF ACTION
7.11.1 Negotiate with local authorities, well before construction, to determine what the needs are for the use of municipal services (water, electricity, sewage wastewater disposal).				- Contractor - PM	During planning phase Pre-Construction
7.11.2 Liaise closely with the relevant authorities on all matters related to the potential use of or impact on public services or service infrastructure, e.g. roads, pipelines, telecommunication, waste facilities, health services, emergency services, law enforcement services and development and mitigation plans.				- Contractor - PM	During planning phase Pre-Construction
7.11.3 Keep the disruption of essential services as short as possible to minimise public inconvenience for both planned and unforeseen events.				- Contractor - PM	During planning phase Pre-Construction
7.11.4 Protect all public and private service infrastructures (e.g. pipelines, cables) by clearly marking these or incorporating the relevant servitudes into 'No-go' areas, where applicable.				- Contractor - PM	As and when required
7.11.5 Negotiate with local authorities, well before construction, to determine what the needs are for the use of municipal services (water, electricity, sewage wastewater disposal).				- Contractor - PM	During planning phase Pre-Construction

## 7.12 TRAFFIC MANAGEMENT

The construction activities may interfere with traffic as a result of road closures during construction.

MITIGATION – TRAFFIC MANAGEMENT	Planning	Construction	Rehabilitation	RESPONSIBLE PARTY	FREQUENCY OF ACTION
7.12.1 Complete construction within the road reserve at the shortest time possible.				- Contractor - PM	On-going
7.12.2 Implement a traffic management plan to indicate how traffic will be managed.				- Contractor - PM	During site set up On-going
7.12.3 Employ flag personnel to regulate the traffic.				- Contractor - PM	As and when required
7.12.4 Landowners must be informed of any road closures prior to it being undertaken.				- Contractor - PM	As and when required

## 8 ENVIRONMENTAL AWARENESS

### 8.1 TRAINING

Part of the contractor's obligations will be to ensure all employees and sub-contractors are trained with regard to the environmental legal requirements, the requirements stipulated in this EMPr and the EA.

Records of daily talks creating environmental awareness must be kept by the contractor. Refer to Appendix E: Training Register.

It is the responsibility of the contractor to monitor the performance of employees and sub-contractors to ensure that the topics communicated during the training have been properly understood and are being followed.

Additional environmental training shall be conducted as determined by the conditions set out in the EA.

### 8.2 CONTINUOUS AWARENESS

Construction information and environmental awareness posters will be displayed at strategic locations identified by the ECO. Damage to the information posters is prohibited.

In addition to toolbox talks, it is proposed that environmental presentations and / or discussions be held to create awareness amongst the site personnel and employees.

A few of the topics that will be discussed include but are not limited to: sanitation, vegetation and ecosystems, waste management, aquatic systems, invasive species, no-go areas and heritage resources.

## 9 COMPLIANCE MONITORING AND REPORTING

Compliance with the EMPr is the responsibility of all the parties that make up the project team, discussed in section 4. Similarly, all these parties have a role to play in EMPr compliance monitoring and reporting in accordance with the authority structure.

The aims of compliance monitoring and reporting are assessing the environmental impacts of the development to determine if it comply with the controls stipulated in the EMPr.

Compliance monitoring should evaluate the compliance to the requirements of section 6 and 7.

The site supervisor should undertake internal compliance monitoring on a monthly basis. Short reports should be drafted and submitted to the EMM for record purposes.

The frequency of all other compliance monitoring will be determined by the conditions set out in the EA.



## 10 COMPLIANCE WITH EMPr

The Final EMPr and EA will form part of the contractual agreement between EMM and the appointed construction contractor. Compliance with the EMPr and EA must therefore form part of all the construction contractor's working tender documentation and be authorised contractually. The recommendations and constraints, as set out in this document are thus enforceable under the General Conditions of Contract.

### 10.1 NON-COMPLIANCE

All deviations from the EMPr that result during the construction phase shall be addressed and remedied by the contractor.

The notice of infringement with the environmental requirements will be provided to the contractor in writing.

Non-compliance must be dealt with as stipulated in the EA.

## 11 CONCLUSION

This draft EMPr for the Witfield stormwater network and attenuation pond, is a supplementary document that builds on the environmental processes that have preceded it, namely the Basic Assessment Process.

The draft EMPr defines responsibilities, provides procedures and the environmental requirements relevant to the minimisation and mitigation of environmental impacts, for the different phases of the proposed project.

It is expected that the relevant parties will 'take ownership' of the EMPr and facilitates the full implementation of and compliance with the EMPr.

The Final EMPr and EA must form part of the construction tender documentation to allow potential bidders to consider the cost for all the required specifications and mitigation measures that are applicable to the construction phase with reasonable accuracy.

**APPENDIX A: RECORD OF REVISIONS**

REV	STATUS	DESCRIPTION OF REVISION	REV. DATE	SIGNATURE APPROVAL ECO	DATE APPROVAL GDARD

## APPENDIX B: COMPLAINT REGISTER

The Complaints Register below must be completed if and when complaints are received.

<b>Complaint number:</b>	
<b>Date of complaint:</b>	
<b>Complainant's name &amp; surname:</b>	
<b>Complainant's contact number:</b>	
<b>Nature of complaint:</b>	
<b>Corrective action taken:</b>	
<b>Date of completion of action:</b>	
<b>Monitored by:</b>	

## APPENDIX C: INCIDENT REGISTER

 <p><b>environmental affairs</b> Department Environmental Affairs REPUBLIC OF SOUTH AFRICA</p> 	<b>Document Type</b>		<b>Emergency Incident Report</b>				
	<b>Title for this incident</b>						
	<b>Date of the Incident</b>						
<b>Reference:</b>		<b>Initial Submission Date:</b>					
<b>Revision No:</b>		<b>Compiled By:</b>					
<p>This form provides a template for the emergency incident report required in terms of section 30(5) of the National Environmental Management Act (Act No. 107 of 1998) (hereinafter "NEMA") in which the responsible person or, where the incident occurred in the course of that person's employment, his or her employer, must, within 14 days of the incident, report to the Director General, provincial head of department and municipality such information as is available to enable an initial evaluation of the incident, including: (a) the nature of the incident; (b) the substances involved and an estimation of the quantity released and their possible acute effect on persons and the environment and data needed to assess these effects; (c) initial measures taken to minimise impacts; (d) causes of the incident, whether direct or indirect, including equipment, technology, system, or management failure; and (e) measures taken and to be taken to avoid a recurrence of such incident.</p> <p>In terms of section 30(1)(a) of NEMA, an "incident" means an unexpected sudden occurrence, including a major emission, fire or explosion leading to serious danger to the public or potentially serious pollution of or detriment to the environment, whether immediate or delayed.</p> <p>In line with section 24 of the Constitution of the Republic of South Africa (Act No. 108 of 1996), "serious" is taken to be a measure of the impact of an incident where such an incident has had, could have had, is having, or will have a negative impact on human health or well-being.</p>							
<b>1) RESPONSIBLE PERSON</b>							
<p>In terms of section 30(1) of NEMA, the "responsible person" includes any person who: (i) is responsible for the incident, (ii) owns any hazardous substance involved in the incident, or (iii) was in control of any hazardous substance involved in the incident at the time of the incident.</p>							
Name							
Designation							
Postal Address							
Physical Address							
Telephone							
Fax							
Email							
Nature of Business							
<b>2) EMERGENCY INCIDENT SUMMARY INFORMATION</b>							
<b>2.1 Fire</b>		<b>2.7 Hospitalisation</b>		<b>2.13 Own emergency response involved</b>		<b>2.19 Emission of toxic substances at low concentration</b>	
<b>2.2 Spill</b>		<b>2.8 Fatalities</b>		<b>2.14 Fire prevention services involved</b>		<b>2.20 Emission of toxic substances at high concentrations</b>	
<b>2.3 Explosion</b>		<b>2.9 Open water Impacts</b>		<b>2.15 Government hazardous materials</b>		<b>2.21 No evacuation required</b>	

				emergency response involved		
2.4 Gaseous Emission		2.10 Ground water Impacts		2.16 More than 1 governmental emergency response service involved		2.22 Immediate area evacuated
2.5 Injuries		2.11 Atmospheric Impacts		2.17 Emission of non-toxic substances at low concentrations		2.23 Immediate surrounds evacuated
2.6 Reportable Injuries		2.12 Soil Impacts		2.18 Emission of non-toxic substances at high concentrations		2.24 Evacuate
2.25 Others						
<p><b>1) INITIAL EMERGENCY INCIDENT REPORT</b></p> <p>In terms of section 30(3) of NEMA, the responsible person or, where the incident occurred in the course of that person's employment, his or her employer must forthwith after knowledge of the incident, report through the most effective means reasonably available: (a) the nature of the incident; (b) any risks posed by the incident to public health, safety and property; (c) the toxicity of substances or by-products released by the incident; and (d) any steps that should be taken in order to avoid or minimise the effects of the incident on public health and the environment to: (i) the Director General; (ii) the South African Police Services and the relevant fire prevention service; (iii) the relevant provincial head of department or municipality; and (iv) all persons whose health may be affected by the incident.</p>						
<b>3.1 Description</b>	<b>3.2 Date</b>	<b>3.3 Time</b>	<b>3.4 Medium</b>	<b>3.5 Name and Contact Details</b>		
Relevant fire prevention service (in case of fire)	[submission date]	[submission time]	[Fax, phone, SMS, letter, etc.]	[Who was the report made to?]		
<b>LOCAL</b>						
<b>PROVINCIAL</b> (Those dealing with environmental issues)						
<b>DIRECTOR GENERAL</b> (Department of Environmental Affairs)						
<b>Any other</b> Director General of National Department, E.g. Water Affairs						
<p><b>2) INCIDENT DETAILS</b></p> <p>In terms of NEMA section 30(5)(a) and (d), the responsible person must report on the nature of the incident as well as the causes of the incident, whether direct or indirect, including equipment, technology, system, or management failure</p>						
<b>4.1 Location of Incident</b>	[Provide physical address of the location where the incident happened including the GPS co-ordinates]					
<b>4.2 Incident start date and time</b>						
<b>4.3 Incident Duration</b>						
<b>4.4 Duration of exposure</b>						

<b>4.5 Incident Description</b>					
<b>Background of the Incident</b>					
<u>Operation:</u>					
<u>Incident Type:</u>					
<u>Root Cause of the incident:</u>					
<u>Contributory Factors to the incident:</u>					
<u>Conclusion:</u>					
<b>4.6 Wind Speed and Direction</b>					
<b>4.7 Ambient air temperature</b>					
<b>4.8 Weather Conditions</b>					
<b>4.9 Other relevant meteorological conditions</b>					
3) POLLUTANTS RELEASED DURING INCIDENT					
In terms of NEMA section 30(5)(b), the responsible person must report on the substances involved and an estimation of the quantity.					
List all the pollutants directly released during the incident (i.e. exclude those pollutants that resulted from mitigation measures, e.g. flaring, treatment, dilution etc.)					
5.1 Substance or mixture of substances	5.2 Reference Number	5.3 Phase e.g. Solid, Liquid or gas	5.4 Total quantity emitted/released	5.5 Units e.g. Kg, L, etc	Nature of emission/release
[The name recognised by any national or internationally recognised chemical referencing system]	[Reference to any national or internationally recognised chemical referencing system]	[solid, semi-solid, liquid or gas]	[the total measured or estimated quantity released into the environment]	[the unit of measure in respect to the quantity]	[Emitted from truck, underground pipe, stack, etc.]
4) SECONDARY POLLUTANTS RESULTING FROM INCIDENT					
In terms of NEMA section 30(5)(b), the responsible person must report on the substances involved and an estimation of the quantity released.					
List all the pollutants that resulted from mitigation measures, e.g. flaring, treatment, dilution etc.					
6.1 Substance or mixture of substances	6.2 Reference Number	6.3 Phase	6.4 Total Quantity emitted/released	6.5 Unit	6.6 Nature of emission
[The name recognised by any national or internationally recognised chemical	[Reference to any national or internationally recognised chemical	[solid, semi-solid, liquid or gas]	[the total measured or estimated quantity released into the environment]	[the unit of measure in respect to the quantity]	[Emitted from truck, underground pipe, stack, etc.]

referencing system]	referencing system]				
<p>5) <b>POLLUTANT CONCENTRATIONS</b></p> <p>In terms of NEMA section 30(5)(b), the responsible person must report on the substances involved and an estimation of the quantity released.</p> <p>List all the pollutants detailed in previous section:</p>					
7.1 Substance or mixture of substances	7.2 Reference Number	7.3 Estimated pollutant concentration on different radius			
		7.3.1 10m	7.3.2 100m	7.3.3 500m	7.3.4 >2000m
[The name recognised by any national or Internationally recognised chemical referencing system]	[Reference to any national or internationally recognised chemical referencing system]	[Estimate the concentration of the Pollutant in water, soil and/or air within a 10m radius of the epicentre of the incident] [provide the units used in a case of estimating concentration. (e.g. ppm)]	[Estimate the concentration of the pollutant in water, soil and/or air within a 100m radius of the epicentre of the incident] [provide the units used in a case of estimating concentration (e.g. ppm)]	[Estimate the concentration of the pollutant in water, soil and/or air within a 500m radius of the epicentre of the incident] [provide the units used in a case of estimating concentration (e.g. ppm) ]	[Estimate the concentration of the pollutant in water, soil and/or air within a >2000 m radius of the epicentre of the incident] [provide the units used in a case of estimating concentration (e.g. ppm) ]
<p>1. Concentration at the plume 2. Concentration that was falling on the ground</p>					
<p><b>1. INCIDENT IMPACT</b></p> <p>In terms of NEMA section 30(5)(b), the responsible person must report on possible acute effects on persons and the environment and the responsible must provide data needed to assess these effects;</p>					
<b>8.1 Minor Injuries</b>	[Describe the number and types of any minor injuries that resulted from the incident or efforts to manage the incident or the impacts thereof]				
<b>8.2 Reportable Injuries</b>	[Describe the number and types of any injuries requiring statutory reporting that resulted from the incident or efforts to manage the incident or the impacts thereof]				
<b>8.3 Hospitalisation</b>	[Describe the number and types of any injuries that required professional medical care that resulted from the incident or efforts to manage the incident or the impacts thereof]				
<b>8.4 Fatalities</b>	[Describe the number and cause of any fatalities that resulted from the incident or efforts to manage the incident or the impacts thereof]				
<b>8.5 Biological Impacts</b>	[Describe any impacts on biological life, other than human life, e.g. fish kills, plant mortality, etc.]				
<b>8.6 Impact Area</b>	[Describe the area possibly affected by the incident or the impacts thereof including: (i) size of the area; (ii) socio-economic context; (iii) population density; (iv) sensitive environments (if any), etc.]				
<b>8.7 Data</b>	Attach relevant impact reports, medical reports, death certificates, post mortem reports, environmental monitoring data, etc. as Annexes C1, C2,... to this report				
<p><b>2. EXISTING PREVENTION PROCEDURES AND/OR SYSTEMS</b></p>					



<b>9.1 Foresight</b>	[Briefly describe whether the incident could have, or had, been foreseen, e.g. was it included in any environmental impact assessment, risk assessment, health and safety plan, etc.]		
<b>9.2 Procedures and/or systems</b>	Attach any relevant safety, health and environmental plans (including any statutory planning requirements) that detail what actions should be taken in the event of the incident that is the subject of this report		
<b>9.3 Procedure and/or systems failures</b>	[Describe any failures or shortfalls in procedures and/or systems that may have contributed to the incident] <b>All procedures and checklist in place and signed off.</b>		
<b>9.4 Technical Measures</b>	[Describe any technical measures, equipment, 'fail-safe' devices, etc. that are in place to prevent the occurrence of the incident] Communications & discussions in place		
<b>9.5 Technical Failure</b>	[Describe any failures of technical measures, equipment, 'fail-safe' devices, etc. that are in place to prevent the occurrence of the incident]		
<b>3. INITIAL INCIDENT MANAGEMENT</b>			
In terms of NEMA section 30(5)(c), the responsible person must report on initial measures taken to minimise impacts.			
<b>10.1 Evacuation</b>	[Describe any evacuation activities including information on the number of people evacuated and whether these people were staff or otherwise]		
<b>10.2 Technical measures</b>	[Describe all technical measures taken to address the incident]		
<b>10.3 Mitigation Measures</b>	[Describe all measures taken to minimize the impact] <b>SOPEP gear activated</b>		
<b>10.4 Emergency Services</b>	[Describe any governmental emergency services involvement] <b>SAMSA/TNPA advised</b>		
<b>4. CLEAN UP AN/OR DECONTAMINATION</b>			
<b>11.1 Clean up and/or decontamination</b>	[Report on initial clean up and or decontamination (remediation) measures taken to minimise the impact of the incident on human health and the environment. Provide copy of safe disposal certificate (if any) and details of the company that undertook the clean-up]		
<b>11.2 Permissions and Instructions</b>	Provide details of any permission and/or instructions received from any organ of state during initial incident management, Clean up and/or decontamination		
<b>11.3 Type</b>	<b>11.4 Status</b>	<b>11.5 Issued By</b>	<b>11.6 Name and Contact Details</b>
[Describe the nature or type of permission or instruction]	[Provide a reference to the legal mandate for the permission or instruction]	[Provide contact details for the permitting or instructing authority]	[provide a summary of the activities carried out in terms of the permission or instruction]
<b>5. MITIGATION MEASURES</b>			
In terms of NEMA section 30(5)(e), the responsible person must report on measures taken and to be taken to avoid a recurrence of such an incident.			
<b>12.1 Measure</b>	<b>12.2 Objective</b>	<b>12.3 Cost</b>	<b>12.4 Timing</b>
[Briefly describe each of the measures taken, and to be taken, to avoid a recurrence of such incident]	[Briefly describe the objective of the measure, i.e. the desired outcome of the measure]	[Estimate the cost of the measure in terms of capital costs and/or recurrent costs]	[Provide information on the timing for the full implementation of the measure]
<b>6. AUTHORISATIONS</b>			
Provide details on all authorisations (including permits, licenses, certificates, etc.) in respect of the activity to which this incident relates.			

13.1 Type	13.2 Statute	13.3 Issued By	13.4 Issue & Expiry Date
[Describe the nature or type of authorisation, e.g. Registration Certificate]	[Provide the reference for the authorisation, e.g. section X of the National Environmental Management Act (Act No. 107 of 1989)]	[Provide contact details for the issuing authority]	[provide the date of issue and expiry]

**7. HISTORY**

Provide details of all similar incidents involving the responsible person in the past (i.e. from 1998). Similar incidents include those that: (i) involved similar circumstances; (ii) involved similar emissions; (iii) involved similar personnel; and/or (iv) involved similar impacts.

14.1 Incident Title	14.2 Report Reference	14.3 Date of Incident	14.4 Summary of event
[Provide the title used in the relevant emergency incident report]	[Provide the reference in respect of the relevant emergency incident report]	[Date of incident]	[Provide a summary of the event]

Signed by or as a mandated signatory for the responsible person		Date	
---	--	------	--

APPENDIX 1 List of affected people as a result of the incident				
Name	Address	Phone	Fault	Remarks

APPENDIX 2 Layout map of the area likely to be affected or affected as a result of the incident

**Disclaimer**

**Any other information not covered in the reporting template must be included**

CAUTION
In terms of section 30 (11) of NEMA as amended, it is an offence not to report an incident and liable on conviction to a fine not exceeding R 1 million or imprisonment for a period not exceeding 1 year, or to both such a fine and such imprisonment



## APPENDIX E: SITE LAYOUT PLAN

The Contractor shall establish his construction camps, storage facilities, stockpile areas, disposal areas, staff accommodation and any other facilities on site in a manner that does not adversely affect the environment.

The Site Plan indicates the exact location, extent and construction details of the construction site facilities and the impact mitigation measures to be put in place.

*To be finalised*

## APPENDIX F: CONSTRUCTION PROGRAMME

*To be finalised*